

ANIMACY IN MORPHOSYNTACTIC VARIATION

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To Tara and Tim McLaughlin,
for being the best parents, role models, and cheerleaders.

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ABSTRACT

ANIMACY IN MORPHOSYNTACTIC VARIATION

Brittany Dael McLaughlin

William Labov

In this dissertation, I demonstrate that animacy of subject referents strongly conditions verbal morphosyntactic variation in English varieties. Using three quantitative case studies, I investigate copula and subject verb agreement in two English varieties, Mainstream American English (MAE) and African American Vernacular English (AAVE). For each of the case studies — (1) MAE auxiliary contraction, (2) AAVE copula contraction and deletion, and (3) AAVE verbal -s deletion — human subjects like *the boy* significantly prefer the contracted or null form, while non-human subjects like *the book* prefer the full or overt form.

The first two case studies, MAE contraction and the parallel feature in AAVE, copula contraction and deletion, demonstrate that inanimate subjects predict the full form, while contracted and (AAVE) deleted forms are more likely with animate subjects. This finding supports Labov's 1969 analysis that AAVE contraction is similar to MAE contraction, and that AAVE contraction and deletion share conditioning constraints. The third case study, AAVE verbal -s, is widely considered not to be grammatically conditioned. However, I find that AAVE verbal -s is also conditioned by animacy, indicating that verbal -s is part of the underlying grammar. Taken together, I use these case studies to argue that animacy is a domain-general processing cue that grammars can structurally reify.

These animacy effects in English shed new light on old variables. From a sociolinguistic perspective, we see that initially unintuitive and unexplored factors like animacy in English are robust predictors of variation. Furthermore, these results allow us to make progress on controversial aspects of grammatical analysis in AAVE, as well as refine our understanding of MAE morphosyntactic variation. These results may also be brought to bear in future discussions of the relationship between MAE and AAVE grammars. Finally, this dissertation contributes to the ongoing question in linguistic and psychological literature about the place of animacy in language, and how processing and grammar interact in linguistic conditioning. With animacy so significantly conditioning variation and having such profound theoretical implications, it is clear that future studies should give careful consideration to the role of animacy in language variation.

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Chapter 1

Introduction

In this dissertation, I demonstrate that animacy has farther-reaching effects than previously thought, and is a crucial factor in morphosyntactic variation in multiple varieties of English, in multiple variables. The case studies presented here are Mainstream American English (MAE) auxiliary contraction, African American Vernacular English (AAVE) copula deletion, and AAVE verbal -s deletion. I find that each of these is conditioned by animacy such that inanimate subjects strongly favor the full or overt forms of the variable. This discovery critically alters and contributes to the analysis of copula deletion and verbal -s deletion in AAVE, two foundational variables in sociolinguistics. Copula deletion was thought to be relatively well-understood in terms of the quantitative factors influencing it, while verbal -s has, until this analysis, been unpredictable in quantitative studies of non-social constraints. Animacy conditioning not only connects copula deletion and verbal -s deletion, but also connects AAVE and MAE, and suggests either implications for the relationship between AAVE and MAE, and/or that animacy effects are cross-linguistically crucial in probabilistic variation. On a broader level, these variables provide testing grounds for whether animacy effects are located in grammatical or processing constraints, or both, and contribute to our understanding of animacy effects on language. Finally, this dissertation demonstrates the

necessity of including animacy conditioning in future studies of sociolinguistic variation.

1.1 Overview

In this introduction, I define animacy and give a background on animacy effects across languages and within English. I also introduce the varieties and variables in question, and describe the methodology used throughout this dissertation. In Chapters 2-4, I differentiate among grammatical, social, and processing constraints, to quantitatively analyze three case studies (1-3). **In each case study, I demonstrate this dissertation's discovery of the robust role of animacy in morphosyntactic variation in a language where animacy was previously thought to be unimportant.** I present animacy effects in each variable, demonstrate that alternate explanations are untenable, and discuss ramifications for the analysis of each variable. In the final chapter, I discuss implications for AAVE, English, animacy, and grammatical versus processing constraints.

(1) Contraction in MAE (McLaughlin and MacKenzie, 2013)

- a. *Full:* The problem **is** here.
- b. *Contracted:* Her mom's Irish.

(2) Copula & contraction in AAVE

- a. *Full:* That show **is** funny.
- b. *Contracted:* My mom's kinda the same.
- c. *Absent:* My daddy \emptyset talkin' about ...

(3) Verbal -s in AAVE

- a. *Present:* Our season **starts** in the summer.
- b. *Absent:* My momma **get** \emptyset over reactive.

1.2 Animacy

1.2.1 Defining animacy

There is no single definition of animacy, but definitions can be separated into biological, semantic, or syntactic in nature. Biological animacy separates entities into living versus non-living. While animacy in language can be linked to biological animacy, it is not defined simply by biological status, but instead semantically or syntactically. In **semantic** definitions of animacy, animacy is based on universal concepts, such as a privileging humans as “more” animate than other living entities. As such, semantic animacy can be construed as a cognitive processing concept, which connects to findings in other domains. In developmental psychology, the ability to distinguish between animate and inanimate objects has been argued to be an innate (or at least early-learned) cognitive categorization with broad ramifications across human behavior (Opfer and Gelman, 2010). For instance, animate nouns are memorized more reliably than inanimate nouns (Nairne et al., 2013).

In contrast, **syntactic** animacy is grammatical, lexically specific, and often arbitrary, functioning as a noun classification system like gender (although it can still make reference to intuitive concepts of animacy). In languages with syntactic animacy effects, grammatical diagnostics can be used to determine the animacy status of an entity. English, however, has no such diagnostics, and is more heuristic in its animacy applications, as I will discuss in Section 1.2.2.

Both semantic and syntactic animacy effects on language often appeal to the notion of **implicational hierarchies** to characterize both categorical and probabilistic variation in animacy within and across languages. These hierarchies can be cross-cut with other characteristics, such as pronoun versus full NP, person and number, and definiteness. For instance, the Silverstein animacy hierarchy characterizes entities as most to least animate on the following scale: 1st person pronouns > 2nd person pronouns > 3rd person pro-

nouns/demonstratives > proper nouns > human > animate > inanimate (Silverstein 1976). This hierarchy allows for typological generalizations about split ergative systems, and in its goal of appealing to a universal human cognition of animacy, is semantic in nature. There are also syntactic animacy hierarchies that are language-specific. For instance, in Navajo, entities are more to less animate on the following scale: Human > Infant/Big Animal > Medium-sized animal > Small animal > Natural force > Abstraction (Young & Morgan 1987).

1.2.2 Animacy effects on language

Morphosyntactic effects

Animacy can be encoded in grammars in various arbitrary ways, such as in differential case marking or verbal agreement marking. In Japanese, the copula must agree with the animacy of the subject, such that there is a different copula for animate versus inanimate subjects. In Russian, nouns can be syntactically animate, but not intuitively or biologically so. Animacy has manifestations in Russian as syncretism in the case marking system, where animate nouns are distinguished from inanimate nouns by which case marking they receive. Thus, animacy effects in Russian are considered syntactic rather than semantic, and are viewed as noun categorization, similar to gender. In differential case marking, prototypicality of the argument's animacy is often used to characterize animacy and case. Overt case is categorical or probabilistically more likely if the animacy of that argument is atypical (Comrie, 1981). For objects, the prototypical animacy is inanimate, therefore, animate (atypical) objects are overtly marked more (as in Spanish, Hindi, Persian, Afrikaans, and Spoken Japanese; Aissen 1999). The prototypical subject is animate, therefore inanimate (atypical) subjects are overtly marked more (Spoken Japanese and Hua; Aissen 1999).

Linearization

Animacy can also affect language through **linearization**, or the “animate-first” effect, such that animate entities categorically or probabilistically occur earlier than less animate entities. This is not considered to be encoded in the morphosyntax, but instead to represent preferences for ordering of argument structures. Navajo is one such language, such that nouns higher in its syntactic animacy scale occur earlier than less animate nouns. Another example of this is German. While animacy does not affect the case-marking or verbal agreement marking of German, the animacy hierarchy is apparent in optional linear ordering of arguments, such that animate subjects are more likely to happen earlier in the structure (Grewe et al., 2006).

English is also considered a language where animacy is not encoded in the grammar, but can affect argument structure through linearization order (Becker 2014). English constructions whose alternations are conditioned by animacy include the genitive (4) and the dative (5) constructions. In the genitive, the *of* construction is more infelicitous the more animate the possessor is (Rosenbach, 2002, Tagliamonte and Jarmasz, 2008). Similarly, in the dative, the prepositional *to* construction is more dispreferred the more animate the object is (cf. Bock, Kathryn, and Irwin, David, 1980, Bresnan et al., 2007, Bresnan and Ford, 2010, Hay and Bresnan, 2006).

(4) **Genitive:**

the **woman**'s shadow > the shadow **of the woman**

(5) **Dative** (Bresnan and Ford, 2010):

give **me** the backpack > give the backpack **to me**

In this dissertation, **I demonstrate that animacy *also* affects English morphosyntax in variable verbal allomorphy. This finding implies that there may be morphosyntactic animacy effects in languages previously thought to have none, hidden within**

features whose variability is still not fully understood.

1.3 Data and methods

1.3.1 Language varieties

This dissertation analyzes variation in verb paradigms in two English language varieties: MAE and AAVE. MAE here is defined as a broad, non-regionally specific variety of English that is shaped by the speech of middle-class, educated speakers. Specifically with regard to the case studies used here, MAE speakers variably use contracted forms for auxiliaries, but do not use null copula or null verbal -s. AAVE likewise is defined as broad and non-regionally specific, and structurally containing core linguistic features associated with African American culture and community. These core features include copula absence and verbal -s absence (Labov et al., 1968, Rickford and McNair-Knox, 1994, Van Hofwegen and Wolfram, 2010). There are regionally-specific varieties of both MAE and AAVE, but this this is not critical for these results given that MAE is not known to regionally vary along these variables, and the AAVE data is from a single area in North Carolina.¹

1.3.2 MAE contraction

For MAE auxiliary contraction, I use 1605 contracted and full tokens of auxiliaries *is*, *has* and *will* from the Switchboard (Godfrey et al., 1992), Fisher Cieri, Christopher, David Miller and Kevin Walker, 2004, and Philadelphia Neighborhood (Labov and Rosenfelder, 2011) corpora. This dataset is used in McLaughlin and MacKenzie, 2013, and is an extended coding of the dataset used in MacKenzie, 2012 and 2013. Collected from 1990-

¹Especially for AAVE, there may be regionally-specific variation in animacy conditioning, similar to morphosyntactic differences laid out in Wolfram, 2007, particularly with regard to differences between urban and rural communities.

1991, **Switchboard** consists of 5-minute phone conversations between two randomly paired speakers about a provided topic. It has approximately 2,400 conversations from 543 speakers, which totals about 240 hours of speech (about 3 million transcribed words). The **Fisher Corpus**, collected from 2002-2003, consists of similarly-collected phone conversations about given topics, and includes 12,000+ speakers. The **Philadelphia Neighborhood Corpus** (PNC; Labov and Rosenfelder, 2011) has been collecting interviews since 1972 as part of the LING 560 speech communities class at the University of Pennsylvania. In this corpus, graduate students conduct sociolinguistic interviews (Labov, 1984) with native Philadelphians. Only speakers with 35+ minutes transcribed are included here, resulting in 43 interviews from PNC being used. From these combined corpora, there are 1081 tokens of *is* (6), and 524 tokens of *has* and *will* (7 and 8).

(6) **Is**

- a. *Full:* The problem **is** here.
- b. *Contracted:* Her mom's Irish.

(7) **Has**

- a. *Full:* I'm sure it **has** been done.
- b. *Contracted:* Well, I'm sure it's been done!

(8) **Will**

- a. *Full:* ... but it **will** last twenty minutes.
- b. *Contracted:* If I walk, it'll be ten degrees warmer ...

1.3.3 AAVE copula and verbal -s

For the AAVE case studies of copula (9) and verbal -s (10), I use the **Frank Porter Graham Corpus**. This longitudinal dataset was collected by the Frank Porter Graham Child Development Institute in Chapel Hill, North Carolina, starting in 1990 with 88 African American

children from age 6-12 months. 71% of participants were at or below the poverty line at the start of the study. I use the subset of data collected when speakers were ages 4-17. At around age 11, participants invited friends to join in natural conversations, supplementing the original speakers with an additional cohort. There are over 2,500 CDs of language data in the total corpus. Interview contexts are varied across grades, and are separated into “formal” versus “casual” by Renn, 2007 and 2010. These include informal contexts such as mother-child interactions and natural conversations among peers, often about specific prompts and goals. Formal contexts include mock speeches and narrative storytelling with the interviewer. The data was coded for copula and verbal -s presence as part of the FPG project in collaboration with NCState, which has been used in studies such as Van Hofwegen and Wolfram, 2010, Renn, 2007 and Renn, 2010.

(9) AAVE copula contraction & deletion

- a. Full: That show **is** funny.
- b. Contracted: My mom’s kinda the same.
- c. Absent: My daddy \emptyset talkin’ about ...

(10) AAVE verbal -s

- a. Present: Our season **starts** in the summer.
- b. Absent: My momma **get** \emptyset over reactive.

For this project, I searched transcripts using Python scripting, which returned all contexts coded as copula or verbal -s presence or absence. From there, they checked to be tokens of present tense copula and present tense verbs, as well as checked for syntactic and phonological contexts that should be excluded. Phonological contexts were determined either manually or automatically using the Carnegie Mellon Pronouncing Dictionary. Quotations were also excluded to avoid any imitated or mock usage of variants, and to avoid

performative codeswitching. The resulting tokens were coded to include subject characteristics like animacy and subject length, as well as verb characteristics like contraction and transitivity. For the copula study, this process resulted in 272 non-pronominal noun phrase (NP) subject tokens from 155 total speakers. NP subjects were isolated in order to avoid the confound of pronouns, which are already known to prefer null copula (Labov, 1969). In the verbal -s case study, auxiliaries *do* and *have* were excluded, resulting in 1716 tokens from 250 speakers are included.

1.3.4 Constraints on variation

The **theoretical framework** in this dissertation views variation as stemming from multiple possible sources. The task of the researcher is to identify which sources are influencing variation (Chapters 2-4), and how/why they are doing so (Chapter 5). These sources are broadly defined as a binary between **internal grammatical constraints**, which are dictated by a particular language's grammar, and **extra-grammatical constraints**, which are not grammar-specific (Wolfram, 1975). These extra-grammatical constraints include the stylistic constraints in the domain of sociolinguists, as well as processing constraints rooted in universal characteristics of human cognition (MacKenzie, 2013, Tamminga and MacKenzie, 2014).

To maximize comparability, I test as many of the same conditioning factors as possible across MAE contraction, AAVE copula, and AAVE verbal -s. These can be grouped into three basic domains: 1) social; 2) grammatical; and 3) processing. **Social constraints** include basic demographic factors like age and sex², as well as stylistic variation like contexts designed to elicit formality or for casualness (note that formal/casual is only available in the AAVE case studies). **Grammatical constraints** include subject type (pronoun vs. NP, as well as more specific categories such as quantifier and wh-word), phonological context,

²I use biological sex because the corpora do not have information on individuals' gender identities.

and, for *is* in MAE contraction and AAVE copula, the grammatical category of the following constituent (NP, adjective, or verb). **Processing constraints** include subject length and frequency. Subject length is operationalized as the number of orthographic words in the subject (MacKenzie 2013). Frequency is calculated using SUBTLEX-US frequency norms, which assesses frequency using 51 million words from American English movie subtitles, and is considered the frequency measure best correlated with behavioral measures (Brysbaert and New, 2009).

1.3.5 Animacy coding

Finally, and most importantly, I code all three variables for **animacy**. It is unclear whether animacy is a grammatical effect, a processing effect, or both, which is a topic I return to in Chapter 5. Animacy is operationalized as human vs. inanimate, following findings that human is at the most animate end of the spectrum in English, and that inanimates are the least animate (Rosenbach, 2005). However, this is a binary representation of something that may be more complex, like the animacy hierarchies that pattern English dative and genitive selection (Rosenbach, 2002) and cross-linguistically (Comrie, 1981). For instance, in dative and genitive alternations, human entities are the most animate, and organizations consisting of humans, such as *the company* are slightly less animate, in contrast to unambiguously inanimate objects like *the table*. In order to make this dataset as conservative as possible, human subjects are contrasted with non-human subjects; the few tokens of animal subjects are excluded.³

While most pronouns are unambiguously animate, there are several that are ambiguous without a full investigation into the discourse topic and context. *They* (which is only relevant for MAE contraction of *will* in Chapter 2) is the pronoun for any plural subject, and

³Preliminary investigations into further subcategories of the animacy hierarchy, such as human organizations, or concrete versus abstract inanimates, yielded inconsistent results or no results at all. Organizations trended with inanimates, and animals trended with humans.

thus could be expected to be a mix of both human and non-human references. *They* is therefore kept as a separate factor group to ensure that it is not interfering with the modeling. *It*, which is relevant for all three case studies, is assumed to be inanimate or expletive in this dissertation. However, *it* can also refer to animals, which have been explicitly excluded in NPs. In fact, *it* can also refer to humans, in the particular case of babies. However, this brings with it a strong connotation of non-humanness, and is even offensive. There may be a difference between the animacy of the grammatical word used, versus the animacy of the referent in the real world, and it is an empirical question which of these is the better predictor of linguistic variation. *It* tokens would need to be coded for their reference in the real world, and then additional probabilistic models would need to be run to determine if the reference type predicted variation better than assuming that the pronoun *it* is inanimate. However, a corpus study is not the best place to ask this question; instead, psycholinguistic research is necessary, as discussed in Chapter 5.

Similarly, NPs with number quantifiers are not immediately codable for animacy, and the animacy of the reference must be used. In these cases, is there still an animacy effect? There is a data sparsity problem with these as test cases, but chi-square tests indicate that animacy is determined semantically by the subject head's referent. This is discussed further in Chapter 5. In the meantime, if the animacy of the subject head is ambiguous, that token is excluded.

1.3.6 Statistics

Here I give a brief overview of the range of methodologies used throughout this dissertation. In each results section, I report the specific statistical modeling and factors used.

Mixed effects modeling

Whenever possible, I use **mixed effects models**, which allow for both fixed and random effects. Mixed effects modeling is increasingly the state-of-the-art in sociolinguistic research, due to its ability to better control for the effect of specific speakers or lexical items on variation (Gorman, Kyle and Daniel Johnson, 2013). Mixed effects models are run using the `glmer()` function of the `lme4` R package, with allomorph selection as the dependent variable, random effects for speaker and subject head, and fixed effects specific to that variable.

In logistic regressions like those used here, the dependent variable is binary, and represented as either a “hit” or a “miss.” Sociolinguists often code the variant of interest as the “hit.” However, I will reverse this in order to maintain an direction of coefficients across variables (note that the only difference this makes is the polarity of the coefficient). This is particularly key in discussing full forms, contracted forms, and null forms in AAVE copula. Rather than code contraction as a hit (a positive coefficient) and null forms as a hit (also a positive coefficient), I code these as “misses”, intuitively matching the direction of the coefficient (now negative) to the amount of phonological substance in the variant. Thus, positive coefficients indicate more phonological substance across all variables and variants, and negative coefficients indicate less phonological substance across all variables and variants.

I use the **log likelihood ratio test** (LLRT) for model-to-model comparisons with the `anova()` function in R. If the LLRT produces a non-significant p-value, that indicates that the models are not significantly different, and that if one is a simpler, more collapsed version of the other, then the use of the simpler model is justified.

Other methods

There are several cases where I do not use mixed effects models. For instance, because AAVE copula has three variants rather than a binary split, I use multinomial logistic regressions in part of that case study. This is the `multinom()` function in the `nnet` R package. In smaller subsets, mixed effects models sometimes fail to converge, so fixed effects models are used rather than mixed (the `glm()` function). Model-to-model comparisons are done for these models using likelihood ratio tests (LRTs) with the `anova()` function in R, with confidence intervals from the chi-squared distribution. This is necessary for AAVE copula when it is collapsed into a binary split. Finally, in the smallest subsets, generalized logistic models do not converge, and chi-squared tests are computed.

Chapter 2

MAE Contraction

2.1 Introduction

2.1.1 Overview

The key question in this chapter is: **animacy affects categorical allomorphy selection in other languages - does it also affect a probabilistic allomorphy choice like contraction in English?** Contraction is an ideal case study for this question because it has been studied extensively (cf. Labov, 1969, Kaisse, 1983, Close, 2004, Anderson, 2008, MacKenzie, 2012, MacKenzie, 2013) and its conditioning factors are well-understood. It has also been compared to one of the most studied variables in AAVE, copula deletion, and as such is a good launching off point for the discussion of animacy, AAVE, and morphosyntactic variation. I find that **animacy does indeed affect contraction rates for the three auxiliaries tested.**

2.2 Literature review

2.2.1 Defining the variable

Contraction as defined here is the reduction of the phonological form of auxiliaries (MacKenzie, 2013). I limit my literature review to the auxiliaries that robustly vary and can be identified as contracted or full from the surface form, namely, *is*, *has* and *will*. In this section, I will first describe contraction in MAE, including the surface variants (full, intermediate, and contracted) and where contraction cannot occur (Section 2.2.1). Then I present the underlying allomorphy and conditioning factors that produce the surface variants (Section 2.2.2), namely, that there are two, not three, underlying allomorphs: the long allomorph and the short allomorph. Finally, I discuss **extra-grammatical effects**, which act on the output of the grammar, and thus affect only the surface rates of allomorphy selection and not the conditioning of them (MacKenzie 2012). These extra-grammatical effects are potentially caused by memory and processing constraints, and as such are expected to be universal and not grammar-specific. Given that the results in this case study are based on the same corpus and coding used in Mackenzie 2012 and 2013, those are what I focus on in this literature review in order to maximize comparability between studies. This section also sets up the foundation for analyzing contraction and its conditioning by animacy in Section 2.4 by discussing several unexplained phenomena.

Before describing the underlying allomorphs, I first look at the surface level variation between contraction and full forms of *is*, *has* and *will* in natural speech (example 11). The surface-level variation of contraction as tripartite, consisting of **full** (12), **intermediate** (13), and **contracted** (14) forms (MacKenzie, 2013).

(11) Variation in contraction in natural speech

- a. *is*: Yeah, Salzburg[z] nice. Austria[z] nice. Europe [ɪz] nice!

- b. *has*: Well, I'm sure it[s] been done! I'm sure it [həz] been done.
- c. *will*: If I walk, it [ə] be ten degrees warmer, but it [wəl] last twenty minutes.

(12) Full forms: no segments missing

- a. *is*: [ɪz], [əz]
- b. *has*: [hæz], [həz]
- c. *will*: [wɪl], [wəl]

(13) Intermediate forms: lacking an initial consonant

- a. *is*: no intermediate form
- b. *has*: [əz]
- c. *will*: [əl]

(14) Contracted forms: lacking the initial consonant and vowel

- a. *is*: [z], [s]
- b. *has*: [z], [s]
- c. *will*: [l]

Contraction categorically cannot occur before a gap (first noticed in Labov, 1969). Gaps can result from wh-movement (15a) or from VP ellipsis (15b). Full forms in these contexts are not within the envelope of variation, and are excluded from analysis of contraction variation. However, auxiliaries preceding wh- or VP remnants, such as in (16), are subject to possible contraction, and are included.

(15) No contraction before a gap [MacKenzie, 2012: 71-71]

- a. Well, I have no idea what that [ɪz]. / (*that's.)
- b. Atlanta's a good city. It really [ɪz]. / (*really's.)

(16) Contraction possible before a gap with a remnant [MacKenzie, 2012: 73]

- a. I don't know how she[z] doing.
- b. As rainy as it[s] been in the last couple of years, there's a, uh, there's a section in South Dallas that has had a whole lot of flooding problems because of the rain.

2.2.2 Analysis

I adopt the analysis from MacKenzie 2013 that MAE auxiliaries have two allomorphs, one long (the full form) and one short (the contracted form). These allomorphs are then affected by phonological rules, resulting in the three possible surface forms (Figure 2.1). The intermediate form [əz] for *has* is underlyingly the long allomorph, but undergoes h-deletion in natural speech. In contrast, the intermediate form [əl] for *will* is underlyingly the short allomorph, but because of phonotactic constraints preventing certain types of consonant clusters in English, it undergoes schwa epenthesis.

	Underlying long		Underlying short	
<i>is</i>	[ɪz]	[əz]	[s], [z]	
<i>has</i>	[hæz]	[həz]	[əz]	[s], [z]
<i>will</i>	[wɪl]	[wəl]	[əl]	[l]

Figure 2.1: Long or short underlying allomorphs of surface representations [chart from Lignos & MacKenzie 2014]

To summarize how this dissertation approaches contraction: contraction is a morphological process whose output undergoes phonological rules (h-deletion for *has* and schwa-insertion for *will*), and then is acted upon by extra-grammatical memory and processing constraints (demonstrated by subject length and frequency effects).

2.2.3 Effects and non-effects

Conditioning on *is*

Is contraction is conditioned by Subject Type (pronoun vs. NP), phonological conditioning, and following constituent.¹ Each of these conditioning factors have also been reported for AAVE copula deletion (Labov, 1969), providing unifying constraints with which to analyze and connect these case studies. With regard to **Subject Type**, *is* contraction is near-ceiling after pronouns. Non-pronominal noun phrase (NP) subjects, however, are followed by auxiliaries that are 40% contracted, and are affected significantly by factors such as following constituent, subject length, and preceding vowel vs. consonant (MacKenzie, 2012). Other possible effects, like preceding syllable stressedness or the grammatical class of the preceding word are not significant.

Is allomorphy selection is also affected by **phonological conditioning**, such that short allomorph selection is higher when the segment preceding the auxiliary is a vowel rather than a consonant (Labov, 1969, Baugh, 1979, Rickford et al., 1991, MacKenzie, 2013). Labov attributes this to a disfavoring effect of consonant clusters (1969). MacKenzie points out that this would predict that allomorphy selection for *has* should follow the same pattern, but vowel vs. consonant is not a significant factor for *has*. To account for this, she proposes that instead of consonant cluster avoidance, the effect on *is* allomorphy selection is instead the result of vowel hiatus avoidance. Rather than disfavoring short allomorph selection after consonants to avoid consonant clusters, short allomorphy is favored after vowels to avoid vowel hiatus.

Preceding *-ing* and preceding non-sibilant fricatives also select more for the long allomorph than the short allomorph, which can also be attributed to vowel hiatus avoidance. However, preceding /t/ goes in the opposite direction, significantly favoring short allo-

¹There may also be social effects on contraction that have not been fully examined. For instance, males contract at higher rates than females (MacKenzie, 2012).

morph selection even more than preceding vowels do. MacKenzie notes that many words ending in /r/ are kinship terms (like *mother, daughter, brother, sister*), and that when these are removed, the phonological effect of /r/ disappears. I will return to this anomaly in the results section, and propose that the explanation for these terms acting differently than others may not be their phonological shape at all. Instead, they all represent human subjects and thus are more likely to select the short allomorph.

In the **following constituent effect**, the grammatical category of the constituent immediately following the copula strongly predicts which allomorph is selected. Following constituents are separated into a hierarchy of grammatical categories, where verbal constituents promote highest contraction rates, followed by adjectival constituent, followed by noun phrases (Labov, 1969, Rickford et al., 1991, and Frank and Jaeger, 2008, among many others). Adjectival constituents are sometimes split into adjectival vs. locative, and are a key data point in the origins controversy of AAVE. However, these finer-grained distinctions in following constituent categories do not improve statistical modeling in MAE contraction, therefore following constituents are collapsed into a three way hierarchy, from most likely to contract to least likely: verb > adj > NP (MacKenzie, 2012).

Conditioning on *has* and *will*

Like *is*, **Subject Type** has a strong effect on *has*, such that short allomorphy selection for *has* after pronouns is near ceiling. Pronoun subjects of *will* do not categorically select short allomorphs, and *it* is significantly less likely to occur with the short allomorph of *will* than any of the other pronouns. One possible reason is that the phonology of *it*, which is the only personal pronoun to end in a consonant, is driving this effect. *Has, have, had* and *is* show no difference between the different pronouns in short allomorph selection probability, while *would* also shows this special status of *it*, leaving it difficult to determine if this is driven by the phonology of *it*, and if so, if the effect is generalizable (MacKenzie, 2012). In

the results section of this chapter, I propose a possible reason, animacy, for the seemingly special resistance that *it* has toward contraction of *will*. The rest of this literature review only refers to previously demonstrated conditioning for NP subjects.

Preceding segment conditions contraction of *has* and *will*, but not along the vowel-consonant split that affects *is*. Unlike *is*, the model for *has* and *will* is significantly better when the place, rather than manner, of articulation is a factor. However, none of the levels of place of articulation (vocalic, velar, labial, coronal) reaches significance. There is no effect for auxiliary identity, indicating that *has* and *will* are not acting significantly differently from one another. Neither is there any interaction between auxiliary identity and any of the fixed effects.

Extra-grammatical effects

Contraction is also affected by extra-grammatical effects, such as subject length and subject frequency. The effect of **subject length**, counted as the number of orthographic words in a subject, is that the longer the subject, the less likely that the short allomorph will be selected (MacKenzie, 2013). Because there is no grammatical cut-off for how long a subject can be and still occur with the short allomorph, the gradient decline of short allomorphy selection by NP length is analyzed as the result of processing effects (MacKenzie, 2012). One explanation is that the longer a subject is, the more likely it is to be planned in a separate chunk from the auxiliary, which decreases the likelihood of a clitic (the short allomorph) being able to attach to the NP. In other words, if the subject is not planned in the same chunk as the auxiliary, it is unlikely to surface as one prosodic word.

Word frequency is known to affect cognitive processes and behavioral responses in speech production (e.g. Jescheniak and Levelt, 1994) and processing times (e.g. Rayner and Duffy, 1986), and affects contraction. The more frequent a subject head is, the more likely it will select the short allomorph (Lignos and MacKenzie, 2013, Lignos and MacKen-

zie, 2014).

2.3 Introduction to results²

2.3.1 Overview

Previous analyses leave open questions regarding how English is affected by semantic concepts like animacy, typically isolating them to effects on linearization of argument structures. More specifically, previous research also leaves open whether animacy effects can be extended to morphosyntactic variation, such as MAE contraction, and how that compares and contrasts with AAVE contraction and deletion. In this section, I demonstrate a novel finding: subject animacy strongly conditions contraction. This effect also explains previously observed anomalous conditioning factors on MAE contraction. Through the rest of this dissertation, I connect this effect to parallel effects in AAVE contraction/deletion, further bolstering the similarities between the two variables, as well as connecting to subject verb agreement through AAVE verbal -s.

2.3.2 Methodology

The findings presented here are based on a database of 1605 tokens from the Switchboard (Godfrey et al., 1992), Fisher (Cieri, Christopher, David Miller and Kevin Walker, 2004), and Philadelphia Neighborhood (Labov and Rosenfelder, 2011) corpora. Auxiliaries after pronoun subjects were excluded, as they nearly categorically display contraction for *is* and *has* (MacKenzie, 2013), but will be discussed for *will*. Additional predictors coded were those found significant in prior work on contraction: subject length in words, and preceding segment (consonant vs. vowel) and following constituent type (Labov, 1969; MacKenzie,

²The work presented here is based on joint work with Laurel MacKenzie, some of which is presented in McLaughlin and MacKenzie, 2013. Any errors in this dissertation are my own.

2012). Results are based on mixed-effects models on *is* (N=1081) with the factors listed above as fixed effects, plus random effects of speaker, preceding word, and following word. *Is* and *has* tokens were coded as contracted when they surfaced as a single consonant with no audible vowel; otherwise they were coded as full. *Will* tokens were coded as contracted when they were missing the initial consonant.

Mixed effects models were run using the `lme4` R package, with allomorph selection as the dependent variable, random effects of speaker and the word immediately preceding the auxiliary, and fixed effects of preceding segment, following constituent (for *is* only), subject length, speaking rate, subject frequency, and subject animacy. Demographic fixed effects of sex, year of birth, and education are also included, as well as a fixed effect from the source corpus.

The tokens were subsetting to those that were clear for animacy of the head noun, as well as clear on whether the subject was a proper name or not. This resulted in 1081 tokens of the auxiliary *is* with NP subjects and 524 tokens for *has* and *will*.

2.4 The animacy effect

2.4.1 Animacy effects on *is*

The novel finding is that animacy has a significant and large effect, such that contraction is more likely with animate subjects (Table 2.1). In fact, after subject length, animacy is the predictor with the largest coefficient (-1.40). One way of describing the magnitude of this effect is that if a subject head is inanimate, it is four times more likely than an animate subject to select the full form. This is contrasted with, for instance, preceding segment, where if a consonant precedes the copula, the full form is two times more likely to be selected. The LLRT (Table 2.2) demonstrates that the model with animacy as a factor

(model1) is significantly improved from the model without (model0). This evidence that MAE contraction is conditioned by animacy is the first main point in this chapter. From there, is animacy located in the grammar, in processing, and/or is it epiphenomenal of a different conditioning factor? The rest of this chapter locates confounds with animacy, and demonstrates that controlling for them does not lessen the initial animacy effect presented here. The rest of this dissertation asks the question, given that animacy is having effects on morphosyntactic variation in English, can the interaction of animacy with other factors shed light on both the source of this effect, and the structures of the variables it is affecting?

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.22	0.35	3.46	0.00
Animate = Y	-1.41	0.22	6.34	0.00
Foll: NP	1.33	0.31	-4.30	0.00
Foll: Adj	0.67	0.29	-2.35	0.02
Prec: Cons	0.60	0.22	-2.69	0.01
log(words)	1.43	0.21	-6.73	0.00

Table 2.1: Mixed-effects model results for contraction of *is* (N=1081)

	Df	AIC	BIC	logLik	Chisq	Chi Df	Pr(>Chisq)
model0	7	1265.3	1300.2	-625.67			
model1	8	1227.6	1267.5	-605.82	39.703	1	0.00

Table 2.2: Comparison of two models for short allomorph selection for post NP *is*: without animacy (model0) and with animacy (model1)

2.4.2 Not just the copula: Animacy effects on *has* and *will*

Given that copula is privileged in other domains (such as being probabilistically conditioned by the following constituent hierarchy in both MAE and AAVE), I investigate if animacy effects are limited to *is*. To do this, I test for animacy effects on *has* and *will*. I start by including both *has* and *will* together, as they share conditions factors. I exclude any

tokens with a preceding sibilant or lateral, because previous sibilants make *has* contraction impossible, and *will* contraction is less likely after laterals. Due to convergence problems, I use only fixed effects (rather than mixed effects) modeling. Below I analyze the basics of modeling *has* and *will* with and without animacy, and demonstrate that there are strong animacy effects.

First we see the same basic effect that we saw in *is*, where the model with animacy (Table 2.3) is significantly better than the model without animacy (as demonstrated by the LRT in Table 2.4). It is interesting to note that non-sibilant fricatives are trending toward significance in this model, but *favor* the short allomorphy for *has* (whereas they favored the *long* allomorph for *is*).

Both *is* and *has* are reduced to the segment /s/ when contracted; one possibility is that the animacy effect could be limited to this phonological form. To test this, I examine *will*, which contracts to the short form /l/. If the phonological form were important for the animacy effect, then I would predict an interaction between the animacy effect and an auxiliary identity factor. However, when run in a separate model, this interaction is not significant ($p=0.13$), and an additional LLRT indicates that this model does not significantly improve the model without the interaction ($p=0.12$).

Contraction of *has* and *will* demonstrates the same animacy conditioning found in *is*, giving us confidence that this effect is not limited to the copula, and is a pervasive morphological effect across MAE auxiliary contraction.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	63.01	15.77	4.00	0.00
Animacy: Animate	-0.62	0.24	-2.58	0.01
Prec: non-sib-fric	-1.11	0.47	-2.35	0.02
Prec: nasal	-0.25	0.32	-0.78	0.44
Prec: r	-0.79	0.34	-2.30	0.02
Prec: stop	-0.89	0.31	-2.85	0.00
Auxiliary: will	-0.12	0.22	-0.52	0.60
log(subjlen)	0.99	0.22	4.48	0.00
Sex: M	-0.29	0.21	-1.36	0.17
YOB	-0.03	0.01	-3.97	0.00
Educ	0.06	0.07	0.84	0.40
Corpus: SWB	1.38	0.76	1.81	0.07

Table 2.3: Fixed effects model for *has* and *will* short allomorphy selection (N=524)

	Resid. Df	Resid. Dev	Df	Deviance	Pr(>Chi)
model0	512.00	583.42			
model1	513.00	590.11	-1.00	-6.69	0.01

Table 2.4: LRT between model without animacy as fixed effect (model0) vs. with animacy (model1)

2.5 Explaining previous anomalies through animacy

2.5.1 Preceding segment: /r/ and kinship terms

Recall from the literature review that MacKenzie 2012 found that the kinship terms *mother*, *brother*, *daughter* and *sister* were significantly more likely to occur with contraction than with the full form. Given that she ruled out the possibility that word-final /r/ conditioned this across words outside of this category (by excluding these four words from the model, and finding that /r/ was no longer significant), and given that these kinship terms all refer to animate subjects, I argue that the animacy effect demonstrated here explains and generalizes the behavior of these terms. To support this, I check if including animacy in the

statistical model neutralizes the preceding segment effect for /r/, and if keeping *mother*, *brother*, *daughter* and *sister* in the model is possible as long as the model controls for subject animacy.

First, notice the skewed proportions of animate subjects in each of the preceding manner categories (Table 2.5, and represented visually in Figure 2.2). Preceding /r/ has the highest proportion of animate subjects (45%), and given that preceding /r/ is correlated with higher contraction rates, and animate subjects are also correlated with higher contraction rates, the preceding /r/ effect may be epiphenomenal of animacy (or vice versa). Also note that words ending in “-ing” are *all* inanimate.

Manner	Percent animate	Animate	Inanimate	Total
r (r)	48%	61	65	121
vowel (v)	35%	88	161	249
non sibilant fricative (f)	32%	16	34	50
consonant (c)	23%	139	472	611
-ing (ing)	0%	0	45	45

Table 2.5: Raw data for manner by animacy

/r/ in inanimate subjects

Here I subset the data into just *inanimate* tokens (N=777) and run the same mixed models on these, to determine if mysterious effects like preceding /r/ and preceding “-ing” disappear when controlling for animacy (Table 2.6).

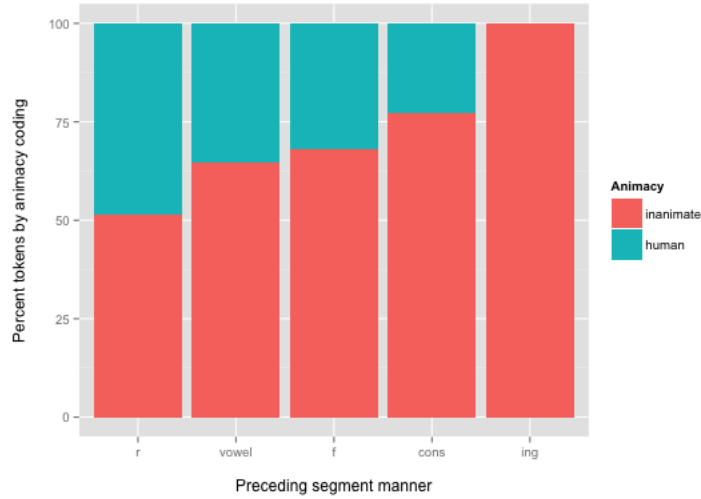


Figure 2.2: Percent of animacy coding by preceding segment manner)

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	38.68	4.85	7.97	0.00
Foll: Like	3.21	0.80	3.99	0.00
Foll: Adj	0.74	0.39	1.88	0.06
Foll: NP	1.55	0.41	3.76	0.00
PrecManner: Cons	0.74	0.27	2.71	0.01
PrecManner: r	-0.53	0.40	-1.32	0.19
PrecManner: ing	1.21	0.55	2.21	0.03
PrecManner: f	2.79	0.89	3.14	0.00
log(subjlen)	1.32	0.24	5.59	0.00
Sex: M	-0.66	0.23	-2.86	0.00
YOB	-0.02	0.00	-8.44	0.00
Educ	0.09	0.05	1.89	0.06
Corpus: L560	-0.59	0.30	-1.95	0.05
Corpus: SWB	1.22	0.65	1.86	0.06

Table 2.6: Mixed-effects model results for contraction of *is* after inanimate NP subjects (N=777)

In Figure 2.6, we see that preceding /r/ no longer has a significant effect. The next question is, are there just not enough inanimate tokens with preceding /r/? However, in Table 2.5, we see that there are more inanimate tokens with subjects ending in /r/ (N=65)

than animate tokens (N=61), so there is no indication of data skewing in this regard.

Now that preceding /r/ is not significant, I test if it can be collapsed with another level in preceding segment without worsening the model. First I collapse it with consonants (model1), but the log likelihood ratio test in Table 2.7 demonstrates that this worsens the model. Next, I collapse it with vowels (model3), and the LLRT (in Table 2.8) is not significantly different for the new model, indicating that we are justified in this collapse. This new model, with /r/ and vowels collapsed, is in Table 2.9. /r/ patterning with vowels supports previous evidence that /r/ is non-consonantal in English (Veatch 1991).

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model1	16	843.51	918.00	-405.76	811.51			
model0	17	833.98	913.12	-399.99	799.98	11.53	1	0.00

Table 2.7: LLRT between model with preceding /r/ separate from preceding consonants (model0) vs. preceding /r/ and consonant collapsed (model1)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model3	16	833.58	908.06	-400.79	801.58			
model0	17	833.98	913.12	-399.99	799.98	1.59	1	0.21

Table 2.8: LLRT between model with preceding /r/ separate from preceding vowels (model0) vs. preceding /r/ and vowels collapsed (model3)

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	38.34	4.81	7.97	0.00
Foll: Like	3.14	0.80	3.92	0.00
Foll: Adj	0.67	0.39	1.71	0.09
Foll: NP	1.51	0.41	3.68	0.00
PrecManner: Cons	0.89	0.25	3.60	0.00
PrecManner: ing	1.36	0.54	2.53	0.01
PrecManner: f	2.89	0.87	3.34	0.00
log(subjlen)	1.29	0.23	5.56	0.00
Sex: M	-0.69	0.23	-2.99	0.00
YOB	-0.02	0.00	-8.48	0.00
Educ	0.10	0.05	2.00	0.05
Corpus: L560	-0.54	0.30	-1.81	0.07
Corpus: SWB	1.33	0.65	2.04	0.04

Table 2.9: Mixed-effects model results for contraction of *is* after inanimate NP subjects, with preceding /r/ collapsed into preceding vowel (N=777)

One interesting development with this subset and the collapse of preceding /r/ and vowels is that the following constituent category of *adjective* is becoming less and less significant. In the final model in Table 2.9, the significance is $p=0.09$, only trending toward significance, with a standard error (0.39) of over half its coefficient (0.64), which indicates that the coefficient is not well-estimated. However, collapsing *adjective* into *NP* is not justified, as an LLRT test reports that the uncollapsed model is significantly better ($p=0.00$). To my disappointment, the “-ing” is not reducible to animacy, at least not the binary human/inanimate coding used here. This effect is still significant, with a large coefficient. This would be an interesting case study to identify if there are other generalizations that could be made about the 45 tokens of “-ing,” including the possibility that this set is somehow “more” inanimate than the other tokens in this inanimate subset.

/r/ in animate subjects

These results predict that the same patterns would be evident in a subset limited to animate NPs. I briefly go through the same steps as before, as well as discuss preceding non-sibilant fricatives. There are no animate tokens with preceding “-ing”, so these will not be discussed in this subsection.

/r/ has no effect in the general model, as shown in Table 2.10, so I test if /r/ should be merged with consonants or vowels. Again, merging /r/ with consonants is worse in an LLRT test than leaving it uncollapsed ($p=0.002$), but merging with vowels is not significantly different than leaving it uncollapsed (Table 2.11). The resulting model is below in Table 2.12.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	24.41	8.19	2.98	0.00
Foll: NP	1.11	0.49	2.26	0.02
colladj	0.68	0.44	1.54	0.12
PrecManner: Cons	0.79	0.44	1.80	0.07
PrecManner: r	-0.94	0.60	-1.56	0.12
PrecManner: f	0.61	0.94	0.65	0.52
log(subjlen)	1.94	0.51	3.81	0.00
Sex: M	-0.03	0.38	-0.07	0.94
YOB	-0.02	0.00	-3.56	0.00
Educ	0.15	0.07	2.03	0.04
Corpus: L560	0.10	0.45	0.23	0.82
Corpus: SWB	2.50	1.02	2.44	0.01

Table 2.10: Mixed-effects model results for contraction of *is* after animate NP subjects, with preceding segment manner uncollapsed (N=304)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model1	14	371.00	422.94	-171.50	343.00			
model0	15	370.51	426.17	-170.26	340.51	2.48	1	0.12

Table 2.11: LLRT between model with preceding /r/ separate from preceding vowels (model0) vs. preceding /r/ and vowels collapsed (model1)

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	20.85	7.96	2.62	0.01
Foll: NP	1.09	0.49	2.22	0.03
colladj	0.67	0.44	1.52	0.13
PrecManner: cons	1.13	0.39	2.93	0.00
PrecManner: f	1.01	0.90	1.12	0.26
log(subjlen)	1.88	0.50	3.75	0.00
Sex: M	-0.01	0.37	-0.02	0.99
YOB	-0.01	0.00	-3.26	0.00
Educ	0.16	0.07	2.17	0.03
Corpus: L560	0.12	0.44	0.26	0.79
Corpus: SWB	2.62	1.01	2.59	0.01

Table 2.12: Mixed-effects model results for contraction of *is* after animate NP subjects, with preceding /r/ collapsed into preceding vowel (N=304)

Below, I further collapse the model for animate subjects into just consonant vs. vowel, with preceding sibilant collapsed with consonant, and preceding /r/ collapsed with vowel (Table 2.13). The LLRT comparing this model to the model with nothing collapsed and the model with only /r/ and vowels collapsed demonstrates that there is no significant difference (Table 2.14).

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	21.19	8.09	2.62	0.01
Foll: NP	1.06	0.49	2.16	0.03
colladj	0.64	0.44	1.45	0.15
PrecManner: cons	1.11	0.38	2.92	0.00
log(subjlen)	1.89	0.50	3.75	0.00
Sex: M	-0.03	0.37	-0.08	0.94
YOB	-0.01	0.00	-3.25	0.00
Educ	0.16	0.07	2.18	0.03
Corpus: L560	0.10	0.45	0.22	0.83
Corpus: SWB	2.63	1.02	2.59	0.01

Table 2.13: Mixed-effects model results for contraction of *is* after animate NP subjects, with preceding /r/ collapsed into preceding vowel and preceding non-sibilant fricative collapsed into consonants (N=304)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model2	13	369.03	417.26	-171.51	343.03			
model1	14	371.00	422.94	-171.50	343.00	0.03	1	0.87
model0	15	370.51	426.17	-170.26	340.51	2.48	1	0.12

Table 2.14: LLRT between model with preceding /r/ separate from preceding vowels (model0) vs. preceding /r/ and vowels collapsed (model1), vs. preceding /r/ and vowels collapsed *and* preceding non-sibilant fricative and consonants collapsed (model2)

2.5.2 Pronoun differences in *will*

Contraction of *will* may provide an additional insight into the animacy effect because, unlike *is* and *has*, *will* does not categorically contract after pronouns (MacKenzie, 2012). There are 1041 tokens of pronoun subjects before *will*, and 291 NP subjects, for a total of 1332 tokens in the entire *will* model. Both animacy and pronominal status improve the model and are statistically significant. In separate models, there is no interaction between the two, indicating that animacy effects are not privileged to either NP or pronoun subjects.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	24.47	12.07	2.03	0.04
Animacy: Animate	-1.34	0.33	-4.09	0.00
SubjectType: Pronoun	-2.62	0.49	-5.34	0.00
Prec: non-sib-fric	-0.21	0.88	-0.23	0.82
Prec: nasal	0.42	0.54	0.77	0.44
Prec: r	0.43	0.65	0.65	0.51
Prec: sibilant	0.37	0.49	0.75	0.45
Prec: stop	-0.17	0.43	-0.39	0.70
log(subjlen)	0.79	0.31	2.52	0.01
Sex: M	-0.55	0.29	-1.93	0.05
YOB	-0.01	0.01	-2.13	0.03
Educ	0.12	0.09	1.34	0.18
Corpus: SWB	2.85	1.01	2.81	0.00

Table 2.15: Mixed-effects model results for contraction of *will* (N=1332)

However, this effect could be morphophonological, such that subjects ending in vowels

are more likely to contract than subjects ending in consonants.³ Within the pronouns, the phonological segment preceding the auxiliary *will* is entirely collinear with the animacy of the pronouns, such that the pronouns ending in vowels are animate (*you, he, she* and *we*), and the pronoun ending in a consonant (*it*) is inanimate. Below I test out various predictions associated with this data. Note: in this smaller data set, the model does not converge unless the subject length factor and the demographic factors are excluded.

If its preceding segment being a consonant is the reason that *it* is contracting less than other pronouns, then we would predict a similar vowel vs. consonant effect in NP subjects. However, when the 291 tokens of *will* after NP subjects are run again in a model with just vowel (N=29) vs. consonant (N=262) as preceding segment, the preceding segment is not significant (Table 2.16), and the LLRT is not significantly different when the preceding segment is excluded. Due to convergence problems mentioned above, however, only two factors were included in this model: animacy and preceding segment.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.77	0.59	3.00	0.00
Animacy: Animate	-1.30	0.35	-3.75	0.00
PrecSeg: cons	-0.10	0.54	-0.19	0.85

Table 2.16: NP subjects by animacy and vowel vs. consonant (N=291)

One could posit that this is a small data problem – there are far fewer NPs ending in vowels than ending in consonants. While the generalized linear model should account for this skewed data, it is possible that, given more NPs ending in vowels, there could be a different effect of preceding segment. To maximize similarities between the NP dataset and the pronoun dataset, I subset to NPs ending in alveolar stops (/t/ or /d/) (N=45) and

³There is also interesting work on “close” phonological relationships that could be causing subject type effects such that pronouns interact with copula differently than full noun phrases. Please see Shwayder, 2014 for general discussion, and Shwayder and McLaughlin, 2013, and McLaughlin and Shwayder, 2014 for discussion specific to the AAVE copula.

vowels (N=29) and run a separate generalized linear model (Table 2.17). There is still no significant effect of vowel on contraction rates, while animacy continues to be a large and significant effect (p=0.01).

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.86	0.70	2.64	0.01
Animacy: Animate	-1.70	0.67	-2.52	0.01
Prec: coronal	-0.61	0.59	-1.03	0.30

Table 2.17: NP subjects by animacy and vowel vs. preceding /t, d/ (N=74)

If this is the result of the animacy effect, then I would predict to see *it* acting differently than other pronouns for other auxiliaries. However, this is only the case for *would* (MacKenzie, 2012). It is possible that the other auxiliaries have hit a ceiling effect for short allomorphy selection, such that there is so little variation to begin with that any additional effect of animacy does not change the outcome. This is not unprecedented, given that the strong and replicated following constituent effect on *is* is also apparent for noun phrase subjects but not for pronouns, which MacKenzie analyzes as result of the ceiling effect of short allomorphy selection for *is* after pronoun subjects (2012).

Therefore, I propose that one possible reason for *it*'s special status is that it is inanimate, and therefore, like NP inanimate subjects, prefers the full form of the auxiliary.

2.6 Ruling out alternative explanations

It is prudent to ask whether the effect is truly attributable to animacy or whether the apparent animacy effect might be epiphenomenal of some other factor that has not been taken into account. In this section I rule out alternative explanations by examining subject weight, frequency, proper name status, and intervening nouns, and find that, while subject weight and frequency do affect contraction, they neither interact with nor supercede the animacy

effect. Proper names, intervening nouns, and prosodic factors have no effect.

2.6.1 Following constituent effects

First I turn to following constituent effects, which could conceivably be confounded with animacy effects, because animates may be more likely to be agents, and agents may be more likely to take verbs as arguments after copula. I compare models of following constituents and determine that the animacy effect does not change how the levels of following constituent should be collapsed. First, I check if animacy and following constituent type interact: there is no significant interaction, and including the interaction does not significantly improve the model. With regard to MacKenzie's collapsing of locative and adjective, that remains non-significant in model-to-model comparisons, justifying the collapse. Any further collapses (such as only having two categories, verb vs. other), are significantly worse than the model with the NP, adjective, and verb, showing that MacKenzie's analysis is robust to animacy in this respect. In other words, although including animacy as a factor significantly improves the model, it does not interact with or change the following constituent effect.

2.6.2 Subject length

Here I test if subject length and animacy are confounded. To further support my claim that the animacy effect is not a result of subject weight, I test *is*. I control for number of words and run the same model on only two-word subjects (N=610, from 320 speakers, with 248 unique subject heads). The animacy effect remains one of the largest coefficients and is highly significant (Table 2.18), demonstrating that animacy conditioning is not simply an epiphenomenon of weight. This model is significantly better than a model without animacy.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.36	0.38	0.95	0.34
Animate: Y	-1.25	0.22	5.66	p < 0.0001
Prec: Cons	0.56	0.27	-2.10	0.04
Foll: NP	0.72	0.34	-2.13	0.03
Foll: Adj	0.54	0.32	-1.67	0.09

Table 2.18: Animacy effects in 2-word subjects (N=610)

These effects are reminiscent of English genitive variation, which is also conditioned by NP weight and animacy. Although NP weight and animacy are highly correlated (Rosenbach, 2005), such that animates are more likely to have low weight, Rosenbach teased apart these factors and determined that they are independent effects.⁴

2.6.3 Frequency

It is possible that the animacy effect could be the result of animate subjects being highly frequent. Under some theories, highly frequent lexical items are claimed to condition reduction near them (Bybee 1997, Bybee, 2002). Thus, the animacy effect could be epiphenomenal of a larger frequency effect. Frequency is computed using SUBTLEX-US frequency norms. Proper nouns are excluded because their frequency measurements are not reliable given that they are often socially- or geographically-constrained.

There is no significant effect of the log odds of lexical frequency for the word immediately preceding the auxiliary *is* ($p=0.27$), nor for the head noun of the the subject ($p=0.40$). There is also no evidence that a more abstract concept of frequency is at play. Frequency of animate subjects as a whole versus inanimate subjects as a whole could be predicted to affect variation. However, the frequency rates in this corpus are not compatible with this account: inanimate subjects are more frequent (72%), yet contract less.

⁴Note that Rosenbach also teased apart topicality and animacy in English, and found that, like weight and animacy, both have independent effects (2012).

Thus, **animacy effects cannot be reduced to a broader frequency effect.**

2.6.4 Proper nouns

Given that Silverstein's animacy hierarchy (1976) includes proper nouns as "more animate" than common nouns (regardless of the semantic animacy of either), it is necessary to check if proper nouns condition contraction rates. Furthermore, it is also possible that animacy and proper noun status could be confounded. However, when a factor for proper name status is included, animacy remains significant ($p < 0.001$), but proper noun status is not a significant factor ($p = 0.72$). When proper nouns are excluded entirely, animacy is still significant ($p < 0.001$). Thus, **the animacy effect is not related to proper noun status, and English variation in general does not appear sensitive to proper noun status.**

2.6.5 Prosodic factors

Finally, prosody may still be having an effect on contraction. There is no effect of preceding syllable stress ($p = 0.318$), but more prosodic factors remain to be examined in further research.

2.7 Conclusion

First and foremost, this case study demonstrates animacy conditioning on English morphosyntactic selection: MAE auxiliaries are more likely to contract following animate subjects. This effect extends across *is*, *has* and *will*, and therefore is neither limited to the copula nor to a specific phonological form. Additionally, this effect has explanatory value for previously anomalous results. Alternative explanations for the animacy effect, such as animacy being confounded with other factors, do not change the robustness and significance of the animacy effect.

Chapter 3

AAVE Copula Contraction & Deletion

3.1 Introduction

MAE contraction and AAVE copula are connected in the literature by shared conditioning and unifying analyses, although the extent to which these variables and varieties are related is controversial. Given these variables' conditioning, this chapter asks if animacy effects are also apparent in AAVE copula. Additionally, one of the goals of this dissertation is to frame AAVE variables in the context of a separation of morphological, phonological, and processing effects. Given evidence that contraction in MAE is allomorphic variation that undergoes phonological rules, and then is affected by processing, it is necessary to revisit the analysis of contraction in AAVE theory.

I demonstrate that **animacy effects do indeed condition AAVE copula contraction and deletion in parallel ways to MAE contraction**. However, despite this similar conditioning with regard to animacy effects, subject length has the opposite effect on MAE contraction and AAVE copula. I discuss contrasting subject length effects further in Section 5.3, and propose that the contrast may imply differences in the default variant.

3.2 Literature review

3.2.1 Defining the variable

In addition to the full, intermediate, and contracted surface forms that we saw in MAE contraction (MacKenzie, 2013), AAVE copula has an additional surface form: absence. When discussing copula variation, I use “absent” interchangeably with “deleted”, but remain atheoretical regarding whether the underlying form of AAVE copula is present (more in line with the Anglicist view) or absent (more in line with the Creolist view). Likewise, I refer to the linguistic feature interchangeably as “copula variation” and the more common term, “copula deletion.”

(17) AAVE copula variation [Labov, 1995: 31-32]

- a. Full: About two **is** in jail, now.
- b. Contracted: She’s not particularly tryin’ to hurt you
- c. Absent: He \emptyset gettin’ cripple up from arthritis.

Like MAE contraction, AAVE contraction and deletion cannot occur before a gap, as in (18) (Labov, 1969: 722).

(18) Ungrammatical contexts for MAE contraction and AAVE deletion

- a. He’s as nice as he says he is/*he’s/*he \emptyset .
- b. He is/*He’s/*He \emptyset now.

There are many “**Don’t Count**” forms in AAVE copula research (discussed in great detail in Blake, 1997). Subject *it*, *that* and *what* occur with near-categorical copula presence, and the [ts] assibilates to [s] (Labov et al., 1968).¹ Following previous methodologies,

¹For further discussion of Don’t Count forms, please see Shwayder and McLaughlin, 2013 and McLaughlin and Shwayder, 2014. Note that these analyses are based on previous versions of the used dataset here, and that the dataset has since been updated and improved. They differ from this dissertation in the analysis of the Subject Type Constraint, and on interpretations of the implications for AAVE copula structure.

these forms are excluded from this case study.

In the AAVE contraction literature, discussion is often focused on the contraction and absence of *is* and *are*. While continuing to investigate the rest of AAVE contraction is necessary (such as *has*, *will*, *would*, negations, etc.), this dissertation focuses on the behavior of the copula with regard to contraction and absence. Furthermore, I do **not distinguish between *is* and *are***. Labov proposed that, due to additional phonological effects of r-dropping, *are* variation should be considered separately from *is* (1969). However, Wolfram found that r-lessness in non-copula words like *poor* is phonologically conditioned by following consonant, while *are* deletion is not, indicating that *are* is not subject to the same phonological rule of r-dropping (1974). Rickford et al. 1991 likewise argue that *is* and *are* should be combined, due to the lack of evidence that they undergo different conditioning effects, and especially due to the desire for higher token numbers. As such, I combine singular and plural NPs.

3.2.2 Theoretical explanations

Copula plays a large role in the ongoing conversation about **AAVE origins**, and whether the variation we see in copula absence/presence is the result of **English influences** (Labov, 1969, Labov, 1995) or the result of a **creole substrate** (Rickford et al., 1991, Romaine, 1982, among many more). I remain atheoretical but point to results that may be relevant to the origins question.

Beyond the question of origins, a **central theoretical question in AAVE contraction and deletion is the order in which these operations occur**. Following Rickford et al., 1991, I refer to the three primary analyses as: Straight Contraction/Deletion, Labov Contraction/Deletion, and Romaine Contraction/Deletion. I detail each of these below, using “C” to stand for surface contracted, “D” as surface deleted, and “F” as surface full tokens (also following Rickford et al., 1991), with my own interpretations of each structure in tree

diagram form included for clarity.

Straight Contraction & Deletion

In **Straight Contraction/Deletion** (Figure 3.1-Figure 3.2), where there is no ordering of contraction and deletion (Rickford et al. 1991). As a result, it does not treat any surface forms as derivationally related, instead treating contraction and deletion as separate, unrelated processes.

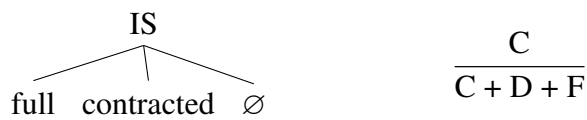


Figure 3.1: Straight Contraction

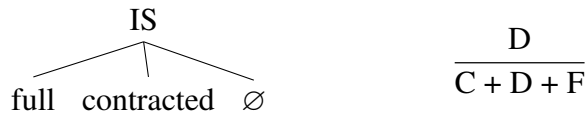


Figure 3.2: Straight Deletion

Labov Contraction & Deletion

In **Labov Contraction/Deletion**, the most common methodology for computing AAVE copula variants (Rickford et al. 1991), AAVE copula absence is interpreted as a deletion process (as in Labov, 1969 and Labov, 1995). Labov proposes that deletion is a phonological reduction process that is an extension of contraction, which he also views as a phonological reduction. The process starts with an underlying overt copula, specifically, the full form. From there, there is a binary choice between the full surface form and underlying contraction (Figure 3.3). From the set of underlyingly contracted forms, there is a choice between surface contracted and surface deleted (Figure 3.4). Total contracted to-

kens are counted as the combination of all contracted and all deleted forms, to represent Labov’s analysis that deletion bleeds contraction (3.3). Because deletion operates only on contracted forms, deletion is counted as percentage out of contracted forms (3.4). This neatly defines the envelope of variation to match the envelope of variation for contraction. Although both contraction and deletion were considered phonological reduction processes, I refer to this analysis as updated to consider the variants as potentially allomorphic in light of MacKenzie’s 2013 evidence that MAE contraction is primarily morphosyntactic, .

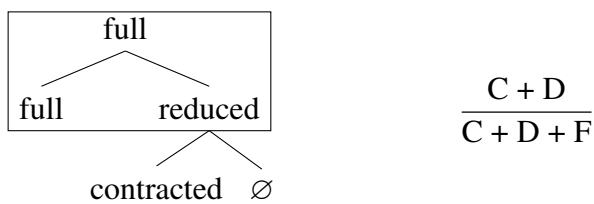


Figure 3.3: Labov Contraction

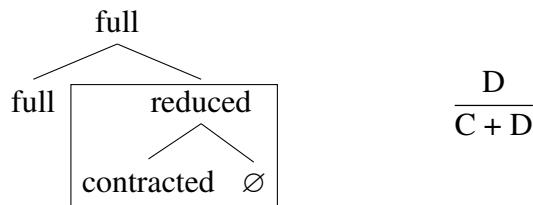


Figure 3.4: Labov Deletion

Labov 1969 interprets AAVE copula deletion as related to MAE contraction based on two critical observations. First, AAVE deletion can only occur in contexts in which MAE contraction is also licensed (Section 3.2.1). Second, AAVE deletion follows parallel conditioning of following constituents and phonological environments. In Sections 2.2.3 and 2.6.1, I overviewed **following constituent effects** on MAE *is* contraction. Similar conditioning occurs on AAVE deletion, such that deletion is most likely in the same hierarchy: verb > adj > NP (Labov, 1969, Rickford et al., 1991).

However, AAVE contraction does not follow this hierarchy when analyzed alone, and could even be interpreted as going in the opposite direction (Labov 1969). If deletion bleeds contraction (Labov Contraction/Deletion), contraction and deletion are affected in similar ways by following constituent (Figure 3.5a). However, if AAVE contraction and deletion are viewed as unrelated (Straight Contraction/Deletion), then AAVE contraction is conditioned by following constituent in the opposite direction from the conditioning on MAE contraction and AAVE deletion (Figure 3.5b). In order to maintain similarity between contraction in MAE and AAVE, and to maintain parallel effects between AAVE contraction and deletion, Labov argues for Labov Contraction/Deletion rule ordering.

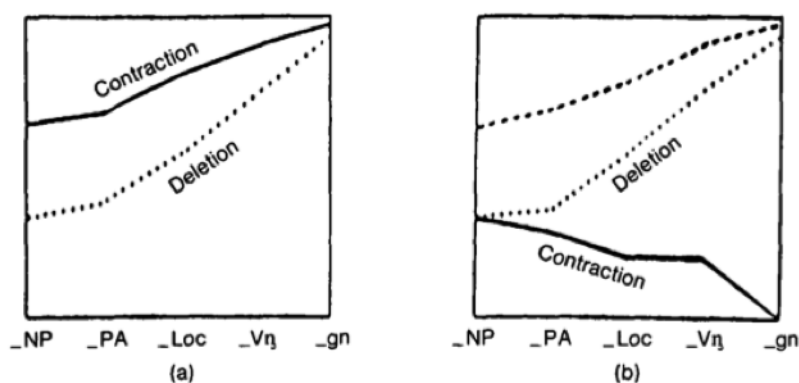


Figure 3.5: (a) Labov Contraction/Deletion (from Labov, 1969:732);
 (b) Romaine Contraction/Deletion (from Labov 1969:733)
 [Formatted as cited in Rickford et al., 1991:122]

However, Wolfram criticizes this approach: “the motivation for this order ... cannot be justified from the quantitative dimensions of the rules, since either order can be accommodated by them” (Wolfram, 1975: 84). Rickford et al. agree: “the only reason the contraction percentages ... rise in tandem with the deletion percentages as one goes from noun phrase to *gonna* is because they are boosted by the deletion percentages at every point; there is no theory-independent or method-independent parallel between the contraction and deletion percentages ‘out there in the real world’” (1991:122).

Rickford et al. challenge the goal of maintaining comparability between MAE and AAVE contraction on the grounds that AAVE's creole origins will affect its contraction conditioning (1991). They simultaneously challenge the analysis that any shared conditioning in MAE and AAVE copula implies a relationship between the two varieties, citing Ferguson's 1971 argument that other languages with null copula in the present tense (Russian, Arabic, and Haitian Creole, among others) nonetheless require overt copula in clause-final, past tense, and stressed positions. Therefore, the shared conditioning on MAE contraction and AAVE copula absence may not demonstrate a shared history between the two varieties, but instead a cross-linguistic generalization that full forms are required in certain syntactic positions.

Romaine Contraction & Deletion

Romaine argues that Labov Contraction/Deletion is not necessary even to maintain parallels among the variables, if the computation of variants is done differently (Romaine, 1982). She operationalizes the variants as **Romaine Contraction/Deletion**, in which the first choice is overt versus deleted (Figure 3.6), followed by the choice for overt forms to contract or remain full (Figure 3.7). Romaine argues that the following constituent hierarchy remains parallel across features, although Rickford et al. point out that this is not entirely the case (1991).

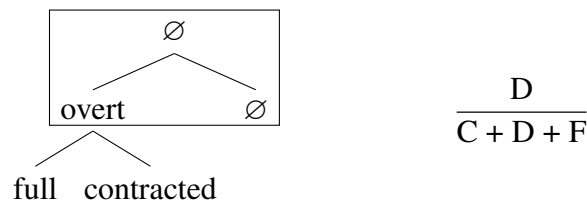


Figure 3.6: Romaine Deletion

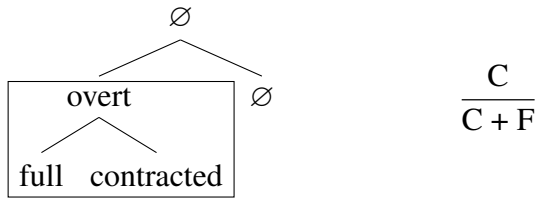


Figure 3.7: Romaine Contraction

3.2.3 Conditioning factors

One of the most replicated conditioning effects on copula absence is the **Subject Type Constraint, in which pronouns are more likely than noun phrases to occur with absent copula**. This constraint was first reported in Labov et al. 1968, and has been replicated in every study that I am aware of since. One example of the relative probability of absence by subject type is Labov's finding that in his Harlem data, 72% of pronoun subjects occur with deleted copula, while only 31% of NPs do (1972).

In addition to the following constituent effect described above, (Labov, 1969, Wolfram, 1969, Mitchell-Kernan, 1971, Baugh, 1979, Bailey and Maynor, 1987) there is also a phonological conditioning effect, such that preceding vowels prefer deleted forms (versus preceding consonants) (Labov, 1969).

3.2.4 Social variation

Intra-speaker variation

Understanding how copula varies across contexts and speakers allows for better control of the potential social factors in the data in this dissertation's results. Crucially, it also enables clearer boundaries between grammatical constraints and style shifting, codeswitching, and inter-speaker variation.

AAVE speakers stylistically vary copula absence, such that in various types of informal

contexts, copula absence rates are higher. In Labov et al.'s 1968 Harlem study, the Thunderbirds used 12% copula absence after NP subjects in single interviews, versus 42% in group interviews. It is interesting to note that the Subject Type constraint lessens but does not neutralize style shifting, such that tokens in single interview styles with pronoun subjects had 51% copula absence, while group styles had 60% copula absence. Wolfram 1969 found a similar stylistic distinction between spoken interviews (41.8% copula absence) versus reading style (7.9%). In research on intra-speaker variation of verbal -s, Rickford and McNair-Knox's 1994 case study of Foxy Boston is the most detailed case study. Two of the interviews can be directly contrasted with regard to style shifting. In one interview, (Interview III, or "Informal"), 18 year-old Foxy Boston was interviewed by an African American researcher whom she knew, along with the researcher's 16 year-old daughter. In this context, Foxy had 70% copula absence, in contrast to 40% absence when interviewed by a white researcher whom Foxy had never met.

Inter-speaker variation

AAVE copula is also subject to **age-grading** (RickfordPrice2013, Baugh, 1996, Van Hofwegen and Wolfram, 2010). Van Hofwegen & Wolfram describe age-grading from age four to 16 in a longitudinal panel study of 32 AAVE speaking children in North Carolina (a subset of the FPG corpus used in Renn, 2007, Renn, 2010, and my results in this case study). As Van Hofwegen & Wolfram point out, copula absence is part of English language acquisition in children.

Van Hofwegen & Wolfram postulate that the particularly high rate of copula absence that they find in four year-olds could be the result of both AAVE variation and typical language development stages. From there, there is a huge dip in copula absence after a few years of schooling, particularly by the 4th grade (also observed in Craig and Washington, 2006). One of the predominant interpretations for this elementary school dive in

vernacular variants is that students are being corrected to prescriptive norms by teachers (Van Hofwegen and Wolfram, 2010).

There is a large range of verbal -s variation across speakers depending on the **level of contact with the black or white speech communities**. Blacks who have high rates of contact with white speakers have low rates of absent copula (Ash and Myhill, 1986). These speakers are contrasted with black speakers with low white contact, who have high rates of absent copula. This finding is replicated in the dataset used in both AAVE case studies, as African American speakers who attend schools with higher percentages of European Americans style shift more than speakers who attend less integrated schools (Renn, 2010).

3.3 Introduction to results

In this section, we see that, like MAE contraction, AAVE contraction and deletion are conditioned by animacy.

3.3.1 Methodology

The data are a subset of the longitudinal Frank Porter Graham Corpus of African Americans from age 1 to 18 in Chapel Hill, NC. The data was coded for copula presence as part of the FPG project in collaboration with NCState, which has been used in studies such as Van Hofwegen and Wolfram, 2010 and Renn, 2007, Renn, 2010. A subset was coded specifically for this project to include subject and subject animacy. 155 total speakers are included. 272 noun phrase subjects in copular contexts were coded for animate versus inanimate. Noun phrase subjects were isolated in order to avoid the confound of pronouns, which are already known to prefer null copula (Labov, 1969), as well as MAE contraction (MacKenzie, 2012).

The distribution of these forms across following constituent is uneven, and an LLRT

between uncollapsed following constituent (including clause, NP, adj, verb, and go) vs. collapsed into two categories (verb vs. other) demonstrates that the model is not significantly affected by the collapse, and thus it is justified. Given that there are fewer tokens, and many unique rather than repeated subject heads, adding a random effect for subject head results in poor model convergence and near-nonsensical results.

In the **previous phonological context**, three types of effects are important for coding and exclusions. There are phonological contexts where contraction is not possible, such as contraction of *is* following a sibilant, such as for the subject *this* in example 19.

(19) This is computer talk

The second type of effect is **previous consonant clusters**, where consonant cluster reduction may reduce a final consonant cluster like *st* to a sibilant, thus falling under the first category of excluding previous sibilants for any study looking at contraction.

The **following phonological context** can make it impossible to distinguish between overt and null copula if the following word begins with a sibilant (20). While this cannot be a full form of *is*, it could either be contracted *he's* or null form *he* \emptyset (as noted in Labov, 1969). Similarly, a plural subject followed by an */t/* can make it difficult to code for presence of contracted *are* (21). There may be fine-grained phonetic distinctions between these, but determining that would require additional study. (For instance, in example 21, the vowel quality of *you* could be the distinguishing factor.) Following previous studies, these forms are excluded.

(20) He ? so nice.

(21) Okay, I'm glad you ? writin'.

Following Blake 1997, questions such as (22) are excluded. Embedded questions with the collocation “what you” are also excluded, as this sequence is also permissible in MAE 23) (whereas “what he” is not).

(22) Where you goin'?

(23) I dunno whatchu talkin' about.

3.4 The animacy effect

In this section, I use the most common structure for analyzing AAVE copula, Labov Contraction/Deletion. As such, contracted and deleted forms are collapsed into one category, underlyingly reduced, and contrasted with the full form. I rerun the present analysis without this structural assumption in Section 3.5.

I now consider whether and how the full versus reduced variants are affected by animacy and other independent predictors. In these models, negative coefficients indicate that the contracted/deleted form is more likely, whereas positive coefficients indicate that the full form is more likely. Mixed models are not possible on this dataset due to the small sample size, thus I use generalized logistic modeling. Gender does not significantly improve the model (in an anova, $p=0.65$), and therefore is excluded from further discussion. Similarly, preceding segment is not included, as it does not significantly improve the model ($p=0.21$). Age trends toward significantly improving the model ($p=0.054$), therefore I include it as a factor. First, I show the model with only following constituent, style, and age (Table 3.1).

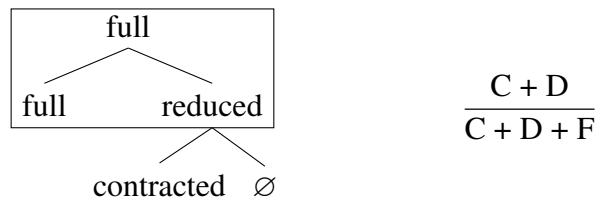


Figure 3.8: Labov Contraction

The model including animacy (Table 3.2) shows a robust and significant effect of

animacy, such that animate subjects prefer contraction/deletion over full forms. If a subject is inanimate, it is three times more likely to select the full form than one of the reduced forms. Anova model comparison supports including animacy as a factor, as it significantly improves the model ($p=0.005$).

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.27	1.63	0.78	0.43
Following: NP	2.22	0.60	3.72	0.00
Following: adj	1.47	0.59	2.51	0.01
Style: formal	1.69	0.45	3.71	0.00
Age	-0.22	0.11	-1.96	0.05

Table 3.1: GLM (fixed effects only) for of contraction/deletion vs. full without animacy (N=191)

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.90	1.72	1.11	0.27
Animacy: Animate	-1.14	0.41	-2.78	0.01
Following: NP	1.74	0.62	2.79	0.01
Following: adj	1.27	0.60	2.11	0.03
Style: formal	1.70	0.47	3.63	0.00
Age	-0.22	0.12	-1.85	0.06

Table 3.2: GLM (fixed effects only) for of contraction/deletion vs. full with animacy (N=191)

3.5 Animacy as a diagnostic for underlying structure

Now we must ask: is the animacy effect in AAVE copula just an artifact of the assumptions we made in collapsing contraction and deletion? Furthermore, can we use animacy as a diagnostic tool to deepen our understanding of AAVE? In this section, I demonstrate that animacy effect in this chapter is robust independently from which underlying structure is assumed. However, by using animacy as a diagnostic tool, I also demonstrate that

differential animacy conditioning on AAVE copula variants is aligned with Labov Contraction/Deletion.

In the literature review, I outlined several arguments claiming that there are underlying forms to the surface variants. Under the theory that shared conditioning can give insights into shared derivations (Labov, 1969), the predictions by underlying structure are as follows. First, recall the structures of each theory. If Straight Contraction (Figure 3.9) is at play, then all three forms should be free to differ significantly from one another. If Labov Contraction/Deletion (Figure 3.11, Figure 3.12) is the best explanation, then we expect null and contracted forms, both of which are phonologically reduced, to pattern together in contrast to full forms (as was assumed in Section 3.4). If, however, Romaine Contraction (Figure 3.14) is the best analysis of the variable, then we would expect null versus overt to be the key distinction, with contraction patterning with full because it still contains phonological material.

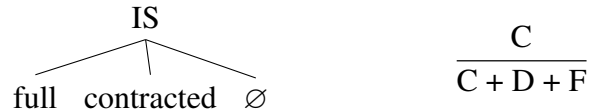


Figure 3.9: Straight Contraction

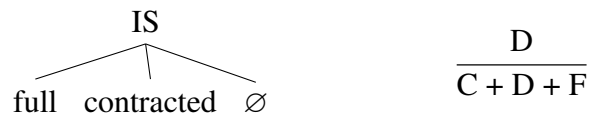
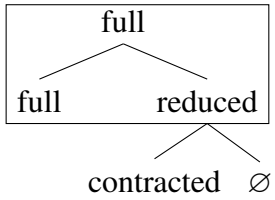
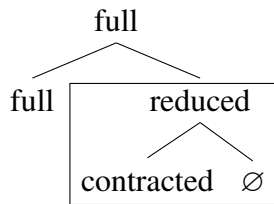


Figure 3.10: Straight Deletion



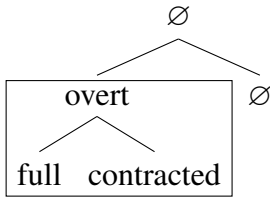
$$\frac{C + D}{C + D + F}$$

Figure 3.11: Labov Contraction



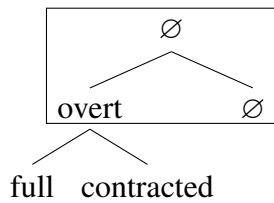
$$\frac{D}{C + D}$$

Figure 3.12: Labov Deletion



$$\frac{C}{C + F}$$

Figure 3.13: Romaine Contraction



$$\frac{D}{C + D + F}$$

Figure 3.14: Romaine Deletion

Figure 3.15 summarizes and categorizes each structural theory with the number of underlying forms we might expect to be differentiated by conditioning factors. The key pieces

of evidence are indicated by arrows: in this section, I will test if there is evidence of constraint differentiation between the null and contracted surface forms, and between the contracted and full surface forms.

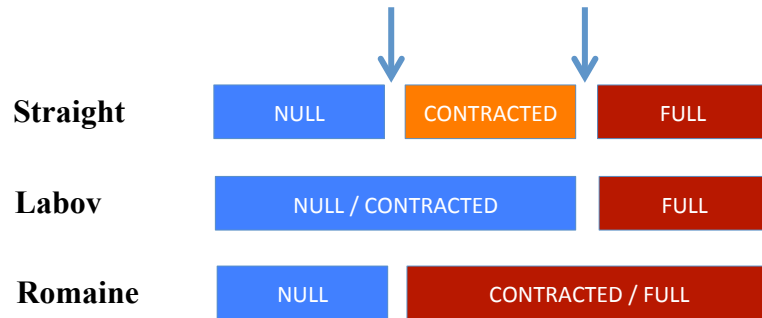


Figure 3.15: Testing points in conditioning effects on surface forms

To assess these predictions, I maintain a three-way distinction between the surface variants by running a multinomial regression, which allows for the dependent variable to have non-binary values. These multinomial logistic regressions compare all three possible surface forms of copula: full, contracted, and null. In Table 3.3, the full form of the copula is the treatment level, allowing us to see how varying different factors increases or decreases the probability of other forms in comparison to the full form. The numbers in the table represent coefficients, and the asterisks represent significance levels. If the coefficients are negative, then that form is less likely than the treatment form (here, the full form), in the context of that conditioning factor. If the coefficient value is positive, then that form is more likely than the full form in if that conditioning factor is present. Gender and age are not included in the model, because they do not significantly improve it (with likelihood ratio tests of multinomial results of $p=0.20$ and $p=0.23$, respectively, when compared to the model without these factors).

Contracted versus full forms

Here the full form is the treatment level (the top row in Table 3.3). This allows for two comparisons: 1) contracted to full; and 2) zero to full. First, let us compare **1) contracted to full**. The primary conditioning factor of interest is **animacy**. When the subject is animate, contraction is more likely to be selected than the full form. In fact, contraction is four times more likely to occur after an animate subject than a full form is. This is parallel to animacy effects in MAE contraction.

Neither of the factors for **following constituent category**, “FollNP” for *following NP*, and “FollAdj” for *following adjective*, are significant (in comparison to the treatment value of *following verb*). Thus, contraction does not significantly differ from full forms with regard to how it is conditioned by following constituent. Likewise, **phonological conditioning**, consisting of “PrecV”, for *preceding vowel* (compared to the treatment form of *preceding consonant*), does not have a significant effect on contraction. Both of these are expected from Labov, 1969, in which AAVE contraction does not follow either the following constituent hierarchy or the preceding phonological conditioning that MAE contraction and AAVE deletion do.

Interestingly, contraction is less likely than full forms in **formal** contexts as compared to the treatment form of casual contexts. There is also a previously unobserved effect of **subject length**, such that longer subjects are more likely to be contracted. This is the opposite direction from MAE contraction subject length effects, and is discussed further in Section 5.2.2.

full	(Intercept)	Animate	FollNP	FollAdj	Formal	PrecV	Subjlen
1)contract	-1.51	1.43*	-0.59	-0.67	-2.23***	0.02	1.60***
2)zero	-0.01	1.32**	-2.09**	-1.51*	-3.04***	0.44	2.70***

Table 3.3: Multinomial logistic regression with full form as treatment level (N=191)

Let us return to our schemata of comparing structures, now updated with these results (Figure 3.16). Although contraction does not differ from full forms along each possible factor, it does significantly differ from full forms in the following factors: animacy, formality, and subject length. Thus, under the assumption that structural theories make predictions about shared conditioning factors, Romaine Contraction/Deletion is less compatible with these results because overt forms would be predicted to pattern together, but do not.

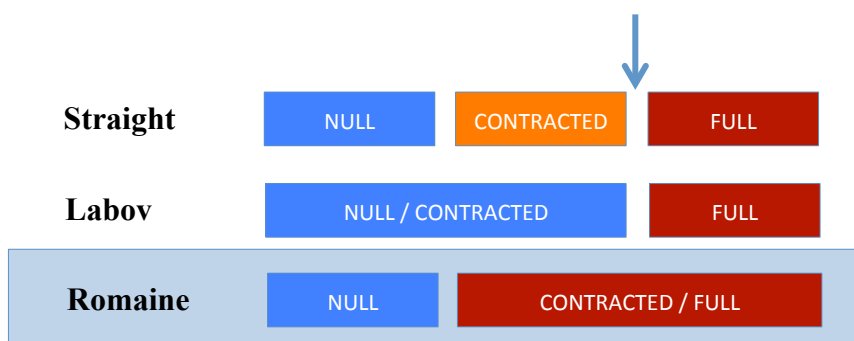


Figure 3.16: Conditioning on contracted versus full surface variants

Zero versus full forms

Now let us move to the second row of Table 3.3 to compare **2) zero to full**. The contrast between zero versus full forms is not a testing site in our schemata, but it is a necessary sanity check. Again, **animacy** has a strong effect. Like contracted forms, deletion is more likely to be selected than full when the subject is animate. Also like contracted forms, deletion is about four times more likely than a full form after an animate subject.

For the **following constituent category**, both “FollNP” and “FollAdj” are significant, such that the zero form is most likely along the traditional hierarchy: verb > adj > NP. This is expected from known conditioning on AAVE deletion (Labov et al., 1968, Rickford et al., 1991). As noted in Section 3.4, and unexpectedly given previous literature (Labov et al., 1968), **phonological conditioning** does not have a significant effect on deletion. This is possibly the result of small token counts for inanimate subjects ending in vowels;

I return to this in more detail in Section 3.7.4. Like for contracted versus full, there is the previously unobserved effect of **subject length**, such that longer subjects are more likely to be contracted. This is the opposite direction from MAE contraction subject length effects, and is discussed further in Section 5.2.2.

Zero versus contracted forms

To check the second testing point, zero vs. contracted, the multinomial model needs to be rerun with contracted forms as the treatment level. In Table 3.4, 1) full is compared to contracted and 2) zero is compared to contracted. The first has already been checked above in Table 3.3, but the second is new and critical information for our diagnostic.

Here we see that there are no factors that affect contraction and deletion significantly differently (see the bolded row of non-significant factors).² Particularly striking is the lack of significance of formality – intuitively, given deletion’s stigmatized status, it would be expected to be significantly different from the non-stigmatized contracted form. Also interesting is the evidence that subject length does not condition differences between contraction and deletion,

Thus, along the shared three factors of *animacy*, *formality* and *subject length* that contrasted the other pairwise comparisons (contracted versus full; deleted versus full), none of these contrasts contracted and deleted forms. To update our schemata, non-differentiation between contraction and deletion is only predicted by Labovian Contraction/Deletion, while both Straight and Romaine would be better supported by significant differences between the two variants.

²One possible reason for this could be low token counts. However, there *are* sufficient token counts to demonstrate significant differences between contracted and full forms, implying that, if there were a robust difference between contracted and deleted forms, it would also be expected to appear with this token count.

contracted	(Intercept)	Animate	FollNP	FollAdj	Formal	PrecV	Subjlen)
1)full	1.51	-1.43*	0.59	0.67	2.23**	-0.02	-1.60*
2)zero	1.50	-0.11	-1.50	-0.85	-0.82	0.42	1.11

Table 3.4: Multinomial logistic regression with contracted form as treatment level (N=191)

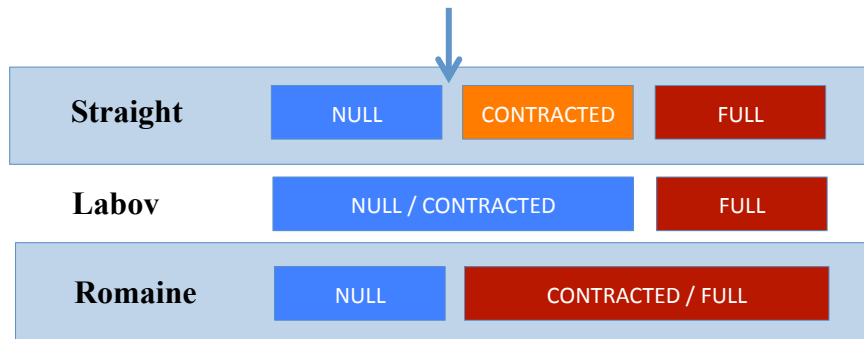


Figure 3.17: Conditioning on contracted versus null surface variants

The crucial finding for this case study is that both contracted and null forms are more likely than full forms after animate subjects. The anova comparing multinomial models with and without animacy demonstrates that the model with animacy is significantly better ($p = 0.001$). With regard to our goal of determining whether categories can be collapsed or not, notice that following constituent type is only significant in the relationship between full and zero forms. Contraction does not evidence a following constituent effect. This replicates Labov's 1969 finding that AAVE contraction does not follow the following constituent hierarchy unless contraction and deletion are combined into a category that is contrasted with full forms. Preceding segment does not appear to have any significant effect on contraction versus full ($p=0.98$) or zero versus full ($p=0.47$). In fact, in a likelihood ratio test of multinomial models using the `anova()` function in R, the multinomial model *without* preceding segment is not significantly different than the model with it ($p = 0.72$).³

³When animacy is not included in the model, the zero form has a coefficient of 0.56, such that it is more likely to occur in the context of a preceding vowel, with a p-value approaching significance at $p=0.06$. However, this effect goes away when animacy is added (which is necessary because the model with animacy

Are full forms special?

At this point, we have seen that full forms act significantly differently than contrasted forms and deleted forms. I have based this section following Labov's assumptions on how shared conditioning factors can shed light on underlying forms (1969). The core of the necessary assumptions for this is that the first binary branch decision in a set of two ordered probabilistic rules will be reflected in shared conditioning. However, this assumption is not necessarily required for making predictions that match the surface output. Here I briefly discuss what other generalizations would be necessary if this is not assumed.

If we do not assume that the first binary decision is reflected in shared conditioning, Straight Contraction/Deletion, Romaine Contraction/Deletion, and a third possibility represented in Figure 3.18 can work with the current findings if generalizations are made solely about the full form. Also note that the full form having special status also works quite nicely with Labov Contraction/Deletion. Conditioning effects would need to be specific to the full form rather than either of the reduced forms. Animacy, subject length, and formality would all be conditioned by the full form, such that inanimates, long subjects, and formal contexts prefer the full form.

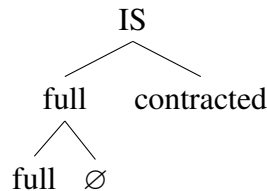


Figure 3.18: Alternate structure

If using a different structure than the Labovian one, the two key reasons that Labov cited for his structure still need to be addressed. First, the generalization that contraction and deletion share the same envelope of variation, such that if one is ungrammatical in a is significantly better than the model without).

context, the other is also. Again, we would need to appeal to the special status of the full form, such that full forms are obligatory in specific syntactic contexts (employing Rickford et al., 1991's proposal).

However, what is lost is the consistency in the following constituent hierarchy between MAE contraction and AAVE contraction, and between AAVE contraction and AAVE deletion. Further investigations with higher token counts for AAVE contraction are necessary to unpack these ideas further and assess the relative contributions and downsides of each structural analysis. I return to the possibility that full forms are special in Chapter 5, where the lack of distinction between contrasted and deleted forms causes problems for cross-linguistic generalizations based on prototypicality.

3.6 Additional results: extra-grammatical effects

3.6.1 Subject length

Like for MAE contraction, I test if subject length has an effect on AAVE copula. As I saw in the multinomial model (Table 3.3), subject length has a significant and robust effect on both contraction and deletion, such that the longer the subject, the more likely that contraction will occur instead of the full form, and likewise that deletion will occur instead of the full form. There is no significant difference between contraction and deletion with regard to the effect of subject length. This is a surprising effect, given that in MAE contraction, longer subject lengths make contraction *less* likely.

This pattern holds in the model collapsing contraction and deletion following Labov Contraction/Deletion (Table 3.5). The addition of subject length as a factor significantly improves the model ($p < 0.0001$).

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	2.43	1.88	1.30	0.20
Animacy: Animate	-1.44	0.45	-3.18	0.00
Foll: NP	1.81	0.70	2.61	0.01
Foll: Adj	1.32	0.67	1.98	0.05
Style: Formal	2.45	0.55	4.43	0.00
Age	-0.19	0.13	-1.53	0.13
Log(subjlen)	-2.26	0.53	-4.26	0.00

Table 3.5: GLM with subject length

While this is a potentially important effect, it should also be noted that there is not a wide range of subject lengths in this dataset (Table 3.6), and it appears to be driven by the difference between one-word subjects and two-word subjects (while three-word subjects appear to prefer full forms). I will incorporate this effect into potential interpretations in Chapter 5, but with the caveat that this will require future investigation to confirm that the subject length effect captured here is reliable and reproducible.

Words in subject	Zero	Contracted	Full
1	17	7	60
2	53	12	21
3	2	0	13
4	0	0	1
6	1	0	0
8	0	0	1

Table 3.6: Token count of copula variant by subject length

3.6.2 Frequency

Here, I test if the frequency of the subject head predicts copula deletion/contraction. While the effect of frequency is significant, such that the more frequent a word, the more likely it will select the contracted/deleted variant, the coefficient itself is rather small (-0.05). The model is significantly improved by adding in this factor ($p=0.02$). A further investigation

with a larger dataset is necessary, including a random effect for subject head especially, in order to ensure that specific subject heads are not skewing the results.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	3.13	1.99	1.57	0.12
Animacy: Animate	-2.02	0.55	-3.64	0.00
Foll: NP	1.64	0.70	2.35	0.02
Foll: Adj	1.13	0.68	1.67	0.09
Style: Formal	2.51	0.58	4.29	0.00
Age	-0.22	0.13	-1.64	0.10
Log(subjlen)	-2.03	0.55	-3.71	0.00
Log(freq)	-0.05	0.02	-2.25	0.02

3.7 Ruling out alternative explanations

3.7.1 Style

As discussed in Section 3.2.4, copula variation in AAVE is subject to intra- and inter-speaker variation. I argue that the animacy effect described here is not due to stylistic context. First, I describe the dataset with regard to formality, and possible confounds in the data. Then, I demonstrate that the animacy effect is still significant and robust even when controlling for style.

There are fewer copula tokens in formal contexts (N=58) than in informal contexts (N=119). This is partly due to fewer words transcribed for formal contexts in general. Formal contexts have relatively few tokens of contracted and deleted; in formal contexts, there are 86% full forms, while in informal tokens, there are only 40% full forms.

Furthermore, formal contexts in this dataset are less likely to contain discussion of animate subjects: 24% of copula tokens have animate subjects in formal contexts, as opposed to 41% animate subjects in informal contexts. Thus, there is a confound between animacy and formality. Given that animate subjects are more likely to have null than inanimate

subjects, and that informal contexts are also more likely to elicit null tokens, the animacy effect could feasibly be an artifact of formality. I tested for an interaction between animacy and formality in the general model, and find that the interaction is not significant, nor does it significantly improve the model in an LLRT comparison. Thus, **the animacy effect is not an artifact of broadly defined formal versus informal contexts.**

3.7.2 Age

Unfortunately, there are not sufficient distributions across age groups of animate and inanimate NP subjects (of which there are only 191 tokens to begin with), to assess the interaction between age and animacy (Figure 3.19). I leave the interaction between animacy conditioning and age as an empirical question for future research in AAVE acquisition.

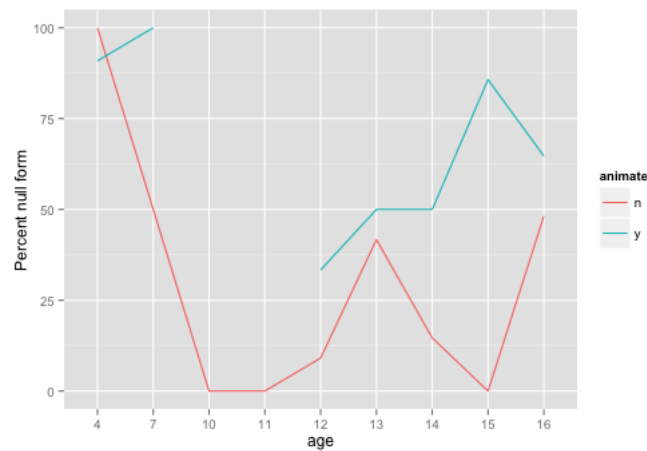


Figure 3.19: Percent absence of copula absence by animacy across age (N=191)

3.7.3 Following constituent

As in previous studies on AAVE copula, following constituent continues to be an important conditioning factor. Here I describe how animacy and following constituent interact in terms of probabilities of animacy by following constituent, and vice versa. Each factor is

significant in the model and improves the model in its own right; however, I discuss the confounds between animacy and following constituency in order to bring attention to the possibility that their effects might be related in an abstract way (such as prototypicality or processing effects, as is discussed further in Chapter 5).

If the animacy effect is an artifact of the following constituent effect, I would expect animate subjects to be most common in verbs, and increasingly less frequent through the rest of the hierarchy. The opposite would be the prediction for inanimate subjects. In the data, animate subjects follow the typical hierarchy slightly less well, being most likely to be followed by adjectives, then verbs, then NPs. In Table 3.7, we see that inanimate subjects are most likely to be followed by NPs, then adjectives, then verbs.

	NP	adj	verb
inanimate	55%	36%	9%
animate	18%	43%	39%

Table 3.7: Percentage of following constituent by animacy of subject

Another way to look at how these factors interact is to look at how the percentage of subject animacy within each following constituent category (Table 3.8). If the following constituent factor is an artifact of animacy, we would anticipate NPs to be preceded by a majority of inanimate subjects, adjectives to be preceded by a mix of inanimate and animate subjects, and verbs to be preceded by a majority of animate subjects. This is in fact the case. However, I do not claim that these two effects are identical; instead, the data supports that these effects both contribute separate predictive value to the model.

	inanimate	animate
NP	81%	19%
adj	55%	45%
verb	25%	75%

Table 3.8: Percentage of animate and inanimate subjects by following constituent

In the LLRT comparing the model that has both animacy and following constituent with the model that has only animacy, the model with both is significantly better than the model with only animacy (Table 3.9). The model with both is also better than the model with only following constituent. This indicates that both conditioning factors contribute to the model, and are not simply just different ways of describing the same effect. However, I highlight their similarities here in the interest of future research, as perhaps there is an overarching generalization that could capture both effects.⁴

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model2	5	178.31	194.28	-84.16	168.31			
model1	7	165.65	187.77	-75.83	151.65	16.66	2	0.00

Table 3.9: LLRT comparing a factor for animacy but without following constituent (model2) with a model with both (model1)

3.7.4 Preceding segment

When preceding segment is included, it is not significant ($p=0.86$), and even if it were, the coefficient is marginal at best (Table 3.10). Now we must ask - how come there have been preceding segment effects in past datasets, but not in this one? Is it because of the addition of the animacy factor, or is there something different about this dataset?

⁴For instance, one way to view these effects could be that prototypicality is driving both of them, and they could both be reduced to a single effect if the type of prototypicality were more clearly defined, and made the correct predictions.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.92	1.71	1.12	0.26
Animacy: Animate	-1.11	0.45	-2.50	0.01
Foll: NP	1.73	0.63	2.77	0.01
Foll: Adj	1.26	0.60	2.10	0.04
Style: Formal	1.70	0.47	3.63	0.00
Age	-0.22	0.12	-1.86	0.06
Prec: Vowel	-0.10	0.55	-0.18	0.86

Table 3.10: Model including preceding segment

Without animacy being included in the model (Table 3.11), we see that preceding segment, while still nowhere near significant, has both a smaller p-value (0.22) and a higher coefficient (-0.60). Perhaps previous studies did not isolate NP subjects when investigating the preceding segment effect, and the high frequency of *he/she* pronoun subjects, and their confound with ending in a vowel, led to a more significant preceding segment effect than expected. Or perhaps there is a confound in this data, such that the effect is there, but is not coming out.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.49	1.62	0.92	0.36
Foll: NP	2.07	0.61	3.41	0.00
Foll: Adj	1.37	0.59	2.31	0.02
Style: Formal	1.72	0.46	3.74	0.00
Age	-0.22	0.11	-1.99	0.05
Prec: Vowel	-0.60	0.48	-1.23	0.22

Table 3.11: Model without animacy, but with preceding segment

I describe here a strange confound in this data, such that inanimate subjects almost all end in consonants (Table 3.12 for raw token count, and Table 3.13 for percentages). Thus, preceding vowel tokens are more likely to be animate. In other words, animacy could account for why preceding vowel has been found to condition deletion/contraction

in AAVE⁵. When these forms are separated, there does still seem to be a trend toward preceding vowel increasing zero forms in the raw data. There does not appear to be an effect on contraction, however, which could be a result of zero forms bleeding contraction (as in Labov Contraction/Deletion). It is an empirical question whether more data, with fewer confounds, would re-introduce the preceding segment effect into the conditioning of AAVE copula.

	c	v
n	107	8
y	45	33

Table 3.12: Raw tokens of subject animacy by segment immediately preceding copula

	c	v
n	93%	7%
y	58%	42%

Table 3.13: Percentage count of subject animacy by segment immediately preceding copula

3.7.5 Subject Type Constraint

While the rest of this case study has dealt only with non-pronominal subjects, in this subsection I compare the contraction/deletion rates of NPs with those of *he/she* subjects. I include a total of 373 pronoun subjects in combination with the 191 DP subjects previously discussed, for a total of 570 tokens. First, I run multinomial models to determine if contraction and deletion remain parallel in their conditioning effects. With full as the treatment level (Table 3.14, we see similar patterns as when this model was run without pronouns: contraction does not significantly differ from full forms with regard to following constituency, but does for everything it did before (animacy, style, subject length), as well

⁵Although it should be noted that identical conditioning exists in MAE contraction, and animacy did not explain it away.

as pronominal status. With large and significant coefficients for pronouns, both contraction and deletion are more likely than full forms after pronouns.

full	(Int)	Pro	Animate	Foll:NP	Foll:Adj	Formal	Subjlen
contract	-1.24	1.58***	1.40*	-0.86	-0.94	-2.08***	1.48***
zero	-0.02	5.83***	1.53**	-2.10**	-1.49*	-2.85***	2.70***

Table 3.14: Multinomial model with full copula as treatment

In contrast to previous models, the model with zero as the treatment variant does reveal a significant distinction between zero and contracted: pronouns prefer the zero form over the contracted form (Table 3.15). Combined with the information from Table 3.14, there is **a hierarchy for variants pronoun subjects**, from order of most preferred to least: **zero > contracted > full**. While for full NPs the collapse between contracted and deleted variants was justified, this collapse is not justified when pronouns are included. However, this is not at odds with the Labov Contraction/Deletion interpretation, and in fact further supports it. Given that the hierarchy is zero > contracted > full, with 99% of pronouns taking zero forms, we can draw a parallel to contraction effects in MAE. In MAE contraction of *is*, selection of the most phonologically reduced allomorph (contraction) is also at ceiling. Thus, it is reasonable that AAVE contraction may be similar, but is being bled by the further step of deletion.

zero	(Int)	Pro	Animate	Foll:NP	Foll:Adj	Formal	Subjlen
contract	-1.22	-4.25***	-0.13	1.24	0.55	0.77***	-1.23***
full	0.02	-5.83***	-1.53**	2.10**	1.49*	2.85***	-2.70***

Table 3.15: Multinomial model with zero copula as treatment

I will return to the issue of Subject Type in AAVE copula in Chapter 5, where I analyze it as patterning according to animacy/referential hierarchies.

3.8 Conclusion

The animacy effect on AAVE copula is not theory-specific, and is robust when all three surface forms are taken at face value. Secondly, if we employ the methodology of predicting derivations from conditioning patterns, animacy gives us an additional diagnostic. The multinomial models provide evidence that the best analysis for AAVE copula is Labov Contraction/Deletion, as it makes the most consistent predictions about the conditioning effects on the three surface variants.

Chapter 4

AAVE Verbal -s

4.1 Introduction

Like copula absence, verbal -s absence is a core feature of AAVE. Unlike AAVE copula, verbal -s is not well-understood, and has been the subject of intense linguistic investigation and controversy since its initial description as a hypercorrected form not present in AAVE grammar (Labov et al., 1968). In studies since, AAVE verbal -s has been characterized as a variable agreement marker, an aspectual marker, and a marker of narrative present. **I argue that verbal -s is part of the grammar based on animacy conditioning effects: AAVE verbal -s is subject to the same kind of animacy conditioning that we saw in AAVE copula and MAE contraction.**

4.2 Literature review

4.2.1 Defining the variable

Verbal -s alternation with a zero form is not specific to AAVE. It also occurs in other nonstandard varieties of English, English-based creoles, early AAVE, and older varieties of

English. The origins question has particularly driven study of dialects that are the potential sources of modern-day AAVE, which include English dialects on the Anglicist side, and African languages and creoles on the Creolist side. This dissertation will focus on verbal -s variation in contemporary AAVE.

The status of 3rd singular -s in AAVE has been debated since the start of AAVE linguistic analysis (cf. Poplack and Tagliamonte, 2004, Labov et al., 1968, and Fasold, 1972). Educational outcomes related to this issue have become a significant research question in the fields of linguistics, psychology, and Education (cf. Terry et al., 2010, Labov and Baker, 2010, de Villiers and Johnson, 2007, and Beyer, 2006, among many others).

Unlike MAE, overt 3rd person singular -s is not obligatory in AAVE. AAVE speakers use the null -s form and the overt -s form, as well a mix of both in the same contexts (24-26, respectively):

(24) **Null:** My momma **get**∅ over reactive.

(25) **Overt:** Our season **starts** in the summer.

(26) **Mixed:** I want a stretch doll that **stretches** and **get** my size.

Verbal -s can also occur on persons other than 3rd person singular, called non-concord -s (27).

(27) **Non-concord -s** [Dayton, 1996: 493]

a. Speaker A: What time do you want me to call?

b. Speaker B: Oh Buff, I **bes** up early. You just call when you get up. I **gets** up early.

When verbal -s occurs on plural subjects (28), referred to forthwith as plural verbal -s, and is documented in both early white Southern speech and early AAE (Aguilar, 2005).

(28) **Plural -s:** Lotsa people calls it. [Aguilar, 2005: 24]

Labov characterizes AAVE speakers as having a rate of over 75% absence (2010). Various studies on AAVE have similar results on the percentage of -s absence, but, crucially, none of them indicate categoricity to verbal -s absence, even in the most casual interview contexts.

- Wolfram 1969: 76%
- Fasold 1972: 65%
- Labov 1972: 72%
- Rickford et al. 1994: 73%

From this definition, we see that there are multiple possible types of verbal -s presence in AAVE: 3rd person singular, non-concord, and plural. 3rd person singular is the type that matches MAE, while non-concord and plural may have roots in nonstandard English dialects and/or creole origins. This dissertation will focus on 3rd person singular instances of verbal -s presence, due to a sparsity of non-concord and plural -s occurrences in this dataset, indicating that other sources of verbal -s presence are not as crucial in this set of speakers.

4.2.2 Theoretical explanations

There are three main explanations for the high level of variation in verbal -s usage in AAVE: **hypercorrection**, **Creole origins**, and **English origins**. The hypercorrection theory defines AAVE as not having subject-verb agreement in the present tense, and any that does occur is the result of dialect contact with the standard (Labov et al., 1968; Fasold, 1972) This predicts that variation is truly random, with no relationship to the origins of AAVE, the phonological or morphosyntactic context, or the aspectual meaning.

The historical background of AAVE has been used to explain AAVE's current form in two distinct ways: as originating from early nonstandard English dialects (the Anglicist tradition), or as originating from an English-African language creole (the Creolist hypothesis). The Anglicist tradition posits that -s usage in Early AAE and its subsequent appearance in AAVE can be explained by its origins in historical non-standard dialects of English, but does not make predictions about its variability in contemporary AAVE. In contrast, the Creolist hypothesis states that -s is an intrusion from a separate grammatical system. This explains the usage of verbal -s as aspectual in WPA Ex-slave Narratives (Brewer, 1986, Bickerton, 1975), and extends to contemporary AAVE such that verbal -s has an aspectual meaning. However, whether or not AAVE has a creole origin does not necessitate that verbal -s is aspectual, and vice versa.

A fourth possibility is that variability in verbal -s usage is based on **conditioning factors** that have not yet been discovered. Conditioning factors that have been investigated, both as effects and as non-effects, are detailed in the section below (Section 4.2.3).

Regardless of the theoretical framework for verbal -s, social variation is still predicted. In the rest of this literature review, I summarize social variation on verbal -s, further details of the grammatical constraints described above, and possible extra-grammatical constraints.

4.2.3 Effects and non-effects

Verbal -s has also been investigated for grammatical effects, but has evidenced very few consistent internal constraints in contemporary AAVE. This section details previous findings as well as non-effects, including: verb type, aspectual meaning, narrative constructions, phonological conditioning, subject type, and possible extra-grammatical conditioning like subject adjacency and weight.

The main observation is that **verb type** influences verbal -s presence, such that main

verbs have zero -s less often than auxiliaries (Labov et al., 1968). In an intra-speaker study of style-shifting, Rickford & McNair-Knox find the same effect of auxiliary versus main verb (1994). They additionally find that some individual verbs act differently than one another within and across contexts. Here, they are separated out into auxiliaries *have*, *do*, and *don't* and the verb *say*, all in contrast to regular verbs like *walk*. Auxiliaries and *say* are more likely to have -s absence than regular verbs, which Rickford & McNair-Knox argue is evidence of internal grammatical conditioning. This conditioning is also apparent across intraspeaker style shifting, except for the verb *say*, which is at ceiling for -s absence. Aside from the examination of main verbs versus auxiliaries, Rickford & McNair-Knox's more specific findings on individual verbs and verb types has not been generalized across speakers. They further discuss how these effects can be disentangled from intra-speaker variation by demonstrating their continued effect across stylistic contexts. My own results in Section 4.3 focuses on the verb type that remains the most mysterious with regard to how verbal -s is conditioned: main verbs.

Early AAE and AAE-related varieties have also evidenced possible **aspectual effects**, and many researchers believe that verbal -s presence in contemporary AAVE may be related to aspectual meanings. Poplack & Tagliamonte point to Comrie 1976, saying that a “‘pure’ aspectual function for -s could not be distinguished from its tense function,” because present tense in English is inherently associated with habituality (2004: 216). They also point to Walker's 2001 proposal that, in early AAE, overt -s is habitual, and null is durative, similar to Brewer 1986 and Bickerton 1975. However, there have been no corpus studies to my knowledge of contemporary AAVE verbal -s demonstrating aspectual effects. There have been other conditioning factors proposed, however, such as discourse characteristics like within **narratives**. Overt verbal -s has been associated with narrative clauses in Philadelphia, without being specific to 3rd person singular (Labov, 1972, Myhill and Harris, 1986), but this has not been replicated in other communities (Rickford 1999,

Moody 2011).

Previous researchers **have not found any phonological conditioning** effects on -s absence (Labov, 1998, Wolfram, 1969, Fasold, 1972, Labov et al., 1968), which led to the hypercorrection proposal that -s was not part of the underlying grammar, but rather due to dialect contact. Phonological conditioning has been reported for Early AAE verbal -s (Poplack and Tagliamonte, 1989, Poplack and Tagliamonte, 1991; Schneider, 1983, Schneider, 1989), but not replicated in modern AAVE, which has been a key piece of evidence for analyzing overt verbal -s as hypercorrection rather than part of the underlying grammar (Labov et al., 1968, Fasold, 1972).

There are also several factors that are reminiscent of effects on MAE and AAVE contraction, namely subject type, distance from verb, and weight. These are clustered together into the Northern Subject Rule (NSR), which conditions verbal -s in nonstandard English varieties (Montgomery, 1994), and has been argued to condition verbal -s in early AAE and AAE-related varieties (Poplack and Tagliamonte, 2001). This rule consists of several parts: **subject type** (such that verbal -s is more likely after NPs than pronouns); and **subject-verb adjacency** (such that non-adjacent verbs are more likely to have -s). While many studies show no effect of subject type, or pronoun vs. NP (such as Labov et al. 1968), in some studies, pronouns are less likely to have overt -s than full NPs (Bailey and Maynor, 1989; Alim, 2004). However, Cukor-Avila notes that the effect is lessening over time, to the point that it may no longer be applicable (1997). There has been no evidence of NSR in modern AAVE (Cukor-Avila, 1997). Given that these factors match closely with extragrammatical factors I examined for the previous case studies, and that there is no evidence that the NSR is still active in AAVE as a grammatical rule, I will discuss these as possible processing effects in my results section.

4.2.4 Social variation

Intra-speaker variation

In this section, I describe intra- and inter-speaker variation effects on AAVE verbal -s. Understanding how verbal -s varies across contexts and speakers allows for better control of the potential social factors in the data in the results section. Crucially, it also enables clearer boundaries between grammatical constraints and style shifting, codeswitching, and inter-speaker variation.

In research on intra-speaker variation of verbal -s, Rickford and McNair-Knox's 1994 analysis of Foxy Boston is the most detailed case study. Two of the interviews can be directly contrasted with regard to style shifting. In one interview, (Interview III, or "Informal"), 18 year-old Foxy Boston was interviewed by an African American researcher whom she knew, along with the researcher's 16 year-old daughter. The other interview (Interview IV, or "Formal"), was with a white researcher whom Foxy had never met. There is significant style-shifting in 3rd singular -s, such that in the informal context, Foxy's rate of absence for main verbs was 67% in the informal interview, but 31% in the formal interview.

There are multiple factors that may be causing Foxy's speech to have higher absence in the informal interview (Rickford & McNair-Knox 1994). The interviewer's race may be affecting the level of style-shifting, as the informal interview is conducted by an African American interviewer and the formal is conducted by a White interviewer. An additional factor is that Foxy is familiar with the interviewer in the informal context, but not in the formal one; familiarity is documented as affecting style-shifting in AAVE (Baugh, 1979). Another factor that may be influencing Foxy's style-shifting is the group nature of the interview; the researcher's 16 year-old daughter is present, and the interview is conducted as a conversation among the three of them. Group interviews often cause style shifting toward the less standard variant (Labov et al., 1968).

Thus, we can expect a range of verbal -s presence across the style shifting spectrum in the data presented in the results section, and need to be aware of the stylistic contexts in the interviews.

Inter-speaker variation

In inter-speaker variation, previous research has indicated predictable verbal -s variation based on **speaker class, speaker sex, familiarity with interlocutor, age and contact with white speakers.**

For **speaker class**, Wolfram finds extreme class stratification in verbal -s usage among African American speakers in Detroit (1969). Lower-working class speakers have 71% absence, while upper-working class speakers have 57%, lower middle class speakers have 10%, and upper middle class speakers a striking 1.4%. For **speaker sex**, Wolfram 1969's Detroit study found that male speakers used about 18% more vernacular forms than female speakers. Rickford & McNair-Knox, however, found that female teenagers overall used higher rates of AAVE features than males (1994), although they note that this could be due to interviewer effects. Renn finds that female speakers style shift toward the standard in formal contexts more than males as they go from childhood to adolescence (2010). With regard to **interlocutor familiarity**, Baugh 1979 investigated which factor produced more verbal -s absence for AAVE speakers; whether they were acquainted with him or not, or whether he initiated a conversation using vernacular or non-vernacular features. He found that familiarity produced a stronger effect than his own speech features, which he interpreted as social context being more important on verbal -s variation than grammatical constraints (1983).

Verbal -s is also subject to **age-grading** (Rickford and Price, 2013, Baugh, 1996, Van Hofwegen and Wolfram, 2010). Van Hofwegen & Wolfram describe age-grading from age four to 16 in a longitudinal panel study of 32 AAVE speaking children in North Carolina

(a subset of the FPG corpus used in Renn 2007, Renn 2010, and my results in this chapter). As Van Hofwegen & Wolfram point out, verbal -s absence is part of English language acquisition in children. Van Hofwegen & Wolfram postulate that the particularly high rate of verbal -s absence that they find in four year-olds could be the result of both AAVE variation and typical language development stages. From there, there is a huge dip in verbal -s usage after a few years of schooling, particularly by the 4th grade (also observed in Craig & Washington 2006). One of the predominant interpretations for this elementary school dip in vernacular variants is that students are being corrected to prescriptive norms by teachers (Van Hofwegen and Wolfram, 2010).

There is a large range of verbal -s variation across speakers depending on the **level of contact with the black or white speech communities**. Blacks who have high rates of contact with white speakers use low rates of null -s (Ash and Myhill, 1986). These speakers are contrasted with black speakers with low white contact, who have high rates null verbal -s. This finding is replicated in this dataset, as African American speakers who attend schools with higher percentages of European Americans style shift more than speakers who attend less integrated schools (Renn, 2010).

4.2.5 Summary

Theoretical explanations for the place of verbal -s in the AAVE grammar are based on constraints, or lack thereof, that have been found in verbal -s variation in modern AAVE and related varieties. The primary analyses of verbal -s can be generalized to two broad ideas: **1) verbal -s is not part of the underlying grammar**, due to the lack of phonological and grammatical constraints on its variation (Labov et al., 1968, Fasold, 1972); or **2) verbal -s is part of the grammar as an aspectual or agreement marker** (indicating present tense, habituality, or narrative present), whose roots can be traced to either Anglican or Creole origins. These are all in the context of verbal -s also being subject to intra- and

inter-speaker variation, resulting in the need for controlling for both context and speaker in any dataset.

4.3 Introduction to results

4.3.1 Overview

In general, internal grammatical constraints do not appear to be significant for the third person singular -s absence at this point, however, they remain a challenge open to future studies. -Alim, 2004

Verbal -s in AAVE is both controversial theoretically and difficult to predict quantitatively. This dissertation will demonstrate additional constraints on verbal -s, and corroborate previous findings that verbal -s is subject to social variation such as style shifting. **In light of these new constraints, many of which are parallel to constraints on AAVE copula, I argue analyze verbal -s is part of the underlying grammar.**

4.3.2 Methodology

The data are a subset of the longitudinal Frank Porter Graham Corpus of African Americans from age 1 to 18 in Chapel Hill, NC. The data was coded for verbal -s presence as part of the FPG project in collaboration with NCState, which has been used in studies such as Van Hofwegen and Wolfram, 2010, Renn, 2007, and Renn, 2010. A subset was coded specifically for this project to include subject, subject animacy, and verb; auxiliaries were excluded. Quotations were excluded to avoid any imitated or mock usage of variants, and

to avoid overt codeswitching¹. 250 total speakers are included, with 1716 tokens (48% null -s).

I performed a coding reliability check on 60 tokens, with few repeat speakers (57 separate speakers), and from 50 separate paired interviews. Of these 60 tokens, I coded 55 of them in the same way (31 null form, 24 overt form). The 5 that I did not code the same way as the original FPG coding were all originally coded as verbal -s presence, but I coded them as absence. If my coding was in fact accurate, this type of coding error is expected when the coders are MAE rather than AAVE speakers, because there may a tendency toward coding what you expect in your own grammar (Labov, p.c.).

Like in the MAE contraction and AAVE copula chapters, only tokens whose subjects could reliably be coded by animacy are included. That means that references to animals are excluded, among other ambiguous contexts. There are several phonological contexts that make coding verbal -s presence either impossible or highly unreliable, and are excluded. This includes verbs before words starting with -s or other sibilants, as in 29. Verbs ending in the consonant clusters [st], such as *insist* and *consist*, are also excluded (30).

Statistical methods are the same as those used in previous chapters. In the mixed modeling for verbal -s, I use random effects for the speaker, the verb, and the subject head.

(29) He break-? stuff.

(30) (Like) she be wrong but still she insist-? that she right.

I limit the discussion of verbal -s to main verbs only, as previous research has indicated that auxiliaries act differently than main verbs (Rickford and McNair-Knox, 1994). Main verb *have* is excluded as well, for ease of coding. In various subsections, I subset or exclude certain types of tokens to investigate specific questions as conservatively as possible. For

¹Quotations were particularly excluded because some of them are quotes from white teachers, and would require coding different from the broad informal versus formal contextual coding I am using here.

instance, in the transitivity subsection, I exclude tokens that were ambiguous with regard to transitivity.

4.4 The animacy effect

In this section, I look at the core effect in this dissertation: that of animacy on verbal -s. First I demonstrate that **animacy is a significant and robust quantitative predictor of verbal -s variation**. Then, I investigate several other factors to determine if there is evidence for animacy effects being related to other possible explanations, and find that it is a robust and independent effect.

In AAVE, stigmatized features are subject to style shifting, codeswitching, and differentiation by sex (among many other effects, such as self-construction of identity). I test if there is any evidence that animacy is correlated with or potentially caused by overt stylistic and identity-based effects like formality of context and sex. The prediction is that a grammatical or processing effect should not interact with these stylistic effects, but instead be apparent across-the-board. Indeed, **animacy effects are evident regardless of style or sex**, and do not interact with either, indicating that **animacy is not part of the social domain of linguistic variation**.

We can see that the coefficient of animacy (-0.87) is not as high as that of formality (2.49), but is still quite large.

Past studies have quantitatively focused on social effects on verbal -s variation, which is shown in Table 4.1 of the data used here. Social effects on language in the FPG corpus are discussed more at length in Renn, 2007, Renn, 2010, and Van Hofwegen and Wolfram, 2010. I demonstrate that animacy of the subject head (Table 4.2) is highly significant in determining verbal -s presence or absence, and significantly improves the model (as shown in the LLRT Table 4.3).

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-3.48	0.69	-5.06	0.00
Age	0.21	0.04	4.74	0.00
Formality: formal	2.66	0.28	9.65	0.00
Sex: M	-0.36	0.26	-1.39	0.16

Table 4.1: Verbal -s selection by social and stylistic factors (N=1755)

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-2.59	0.70	-3.69	0.00
Animacy: human	-0.87	0.21	-4.21	0.00
Age	0.20	0.04	4.58	0.00
Formality: formal	2.49	0.27	9.13	0.00
Sex: M	-0.37	0.25	-1.47	0.14

Table 4.2: Verbal -s selection by animacy of subject, as well as social and stylistic factors (N=1755)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model0	7	1789.78	1827.33	-887.89	1775.78			
model1	8	1780.96	1823.87	-882.48	1764.96	10.82	1	0.00

Table 4.3: LLRT where model1 includes animacy as a factor and model0 does not

4.5 Additional results: grammatical effects

4.5.1 Subject type: wh- words

Although pronoun vs. NP is not predicted to affect verbal -s from most of the previous literature (such as Labov et al., 1968), there has been at least one observation that it could (Alim, 2004). I check this factor for this reason, as well as to maximize comparability with MAE contraction and AAVE copula. I find that the only subject type category that is relevant is wh- word subjects, which condition overt -s.

I separate subject types into pronouns (*he, she, it*), pronoun-like subjects (*mine, that, this*, wh- subjects (*what, which, who*), quantifiers (*all, any, anybody, each, every, everybody, everyone, everything, nobody, none, one, somebody, someone, something, whoever*), and noun phrases (such as proper names, “your teacher”, and “the food class”). Noun phrases with relative clauses such as “the big circus wheel that go” are coded as NP subjects (and are also coded as relative clauses in a separate factor discussed in Section 4.5.2). There are no tokens with existential *here* or *there* as subject heads.

This first pass results in a subject type effect such that both pronouns and wh- words condition overt -s (Table 4.4) in comparison to the treatment level of NP. This model improves on the model without subject type (Table 4.5).

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-1.95	0.61	-3.21	0.00
Animacy: human	-1.00	0.16	-6.14	0.00
Subject type: wh-	1.79	0.46	3.91	0.00
Subject type: pro	0.32	0.16	1.97	0.05
Subject type: pro-like	0.05	0.35	0.13	0.89
Subject type: quantifier	-0.03	0.27	-0.10	0.92
Age	0.15	0.04	3.93	0.00
Formality: formal	2.19	0.23	9.41	0.00
Sex: M	-0.46	0.24	-1.89	0.06

Table 4.4: Subject type effects on entire dataset

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model1	8	2086.28	2130.49	-1035.14	2070.28			
model2	12	2075.30	2141.61	-1025.65	2051.30	18.99	4	0.00

Table 4.5: LLRT comparing model1 without subject type to model2 with subject type

These subject type effects might in fact be the result of NPs being affected by subject length in a way that pronouns (and other subject types) are not, because they are one-word

subjects². To test this, I subset out to only one-word subjects (N=1703), and rerun the model. In Table 4.6, there is no longer any pronoun vs. NP effect, but there is still a strong wh- effect, such that verbal -s is much more likely to be present after wh- subjects. Including subject type in the model significantly improves it from the model without subject type (Table 4.7).

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-1.97	0.71	-2.76	0.01
Animacy: human	-1.10	0.19	-5.75	0.00
Subject type: wh-	1.33	0.50	2.65	0.01
Subject type: pro	-0.05	0.26	-0.20	0.84
Subject type: pro-like	-0.49	0.42	-1.19	0.23
Subject type: quantifier	-0.37	0.38	-0.98	0.33
Age	0.19	0.05	4.13	0.00
Formality: formal	2.20	0.28	7.77	0.00
Sex: M	-0.46	0.25	-1.83	0.07

Table 4.6: Subject type effects on one-word subjects only (N=1703)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model1	8	1739.03	1781.66	-861.52	1723.03			
model2	12	1732.81	1796.75	-854.40	1708.81	14.22	4	0.01

Table 4.7: LLRT comparing model1 without subject type to model2 with subject type in one-word subjects

Can the other subject type categories be collapsed into two groups, so that they simply represent whether a subject is a wh-word or not? The collapsed model in Table 4.8 is not significantly different than the previous, uncollapsed model (LLRT in Table 4.9), indicating that the collapse is justified.

²Although there are the occasional multi-word pronoun-headed subjects in the form of appositives like “John he.”

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-1.98	0.68	-2.91	0.00
Animacy: human	-1.05	0.18	-5.90	0.00
Subject type: wh-	1.42	0.44	3.21	0.00
Age	0.18	0.05	4.01	0.00
Formality: formal	2.15	0.28	7.74	0.00
Sex: M	-0.48	0.25	-1.90	0.06

Table 4.8: Subject type collapsed to binary levels: wh-word vs. other

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model2	9	1729.66	1777.61	-855.83	1711.66			
model3	12	1732.81	1796.75	-854.40	1708.81	2.85	3	0.42

Table 4.9: LLRT comparing model2, with full subject type categories, and model3, with subject type collapsed to wh-word vs. other

Thus, wh- words condition verbal -s differently than a combined category of pronouns, pronoun-like subjects, NPs, and quantifiers. One possible reason could be that 39 of the 60 tokens of one-word wh- subjects are questions, and that wh- questions condition verbal -s. There are too few non-question wh- subjects to investigate this with confidence, but I do a preliminary investigation here by further subsetting the data to the 60 wh- subject tokens. From the raw data in Table 4.10, the trend appears to be that wh- question and non-question contexts do not differ by verbal -s absence (24% absence for wh- and 23% absence for wh-q). Subject type is not significant in the model (Table 4.11). Wh- vs. wh-q as a factor does not improve the model (Table 4.12). Note that animacy still is robust and significant, which is in line with the rest of this dissertation, and indicates that I might expect strong effects to still be apparent in this subset. However, given the sparsity of data, these preliminary observations should be further investigated with larger and less skewed sample sizes of wh-subjects.

	*3s	3s
wh	5	16
wh-q	9	30

Table 4.10: Raw tokens of wh and wh-q verbal -s coding

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.97	3.90	0.25	0.80
Animacy: human	-1.98	0.99	-2.01	0.04
Subject type: wh-q	1.28	0.94	1.36	0.17
Age	0.10	0.28	0.36	0.72
Formality: formal	0.77	1.23	0.63	0.53
Sex: M	-1.09	0.80	-1.36	0.17

Table 4.11: No subject type effects in wh- words

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model0	8	66.23	82.43	-25.11	50.23			
model1	9	66.68	84.91	-24.34	48.68	1.55	1	0.21

Table 4.12: LLRT between model0 with no factor for question contexts, and model1 with factor for question contexts

4.5.2 Non-effects: Relative clauses and conjunctions

There are 58 verbal -s tokens after relative clauses (“the big circus wheel that **go**”) and 38 tokens after conjunctions (“because he smoke and **drink**”). Neither are significant factors or improve the model when run on the entire dataset. However, this could be a small data problem. To narrow the dataset, I use the subset of non-wh NP subjects to further investigate relative clauses and conjunctions. 40 of the 58 relative clause tokens are in this subset (9% of all NP tokens), and 18 of the 38 conjunction tokens are in this subset as well (4% of all NP tokens). These still fail to show any statistical indication that they are

affecting verbal -s. However, the raw data tokens for conjunction in particular may indicate that a verb following a conjunction may be more likely to have an overt -s than a verb not following a conjunction (Table 4.13), but the number of tokens is quite limited (Table 4.14).

In contrast, there does not appear to be a major trend of differentiation in the raw data between subjects with and without relative clauses, as shown in the raw data (Table 4.16) and the percentages of the raw data (Table 4.15)

The lack of clear findings here is a small data problem, and more definitive results would require a detailed investigation on a larger dataset of relative clauses and conjunctions.

	*3s	3s
conjunction	33.33%	66.67%
other	48.24%	51.76%

Table 4.13: Percentage of verbal -s by conjunction status

	*3s	3s
conjunction	6	12
other	205	220

Table 4.14: Raw tokens of verbal -s by conjunction status

	*3s	3s
relative clause	42.50%	57.50%
other	48.14%	51.86%

Table 4.15: Percentage of verbal -s by relative clause status

	*3s	3s
relative clause	17	23
other	194	209

Table 4.16: Raw tokens of verbal -s by relative clause status

4.6 Additional results: extra-grammatical effects

4.6.1 Subject length

Previously, we saw that subject length has an effect on contraction rates in both MAE and AAVE. Given that subject length may affect other morphosyntactic variation, I test and demonstrate that subject length also affects verbal -s selection. This is particularly interesting because, unlike in contraction, the subject is not adjacent to the agreement marker in question.

In Table 4.17, we see that subject length does indeed have a significant effect, such that the verbal marker is more likely to be null the longer the subject is. Due to convergence problems, the model is fixed rather than mixed effects. The LRT in Table 4.18 demonstrates that the model with subject length is significantly better.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.38	0.25	1.54	0.12
Animacy: human	-0.99	0.12	-8.08	0.00
Subject type: wh-	1.09	0.37	2.91	0.00
log(subjleng)	-0.33	0.15	-2.21	0.03
Age	0.02	0.02	1.09	0.27
Formality: formal	1.54	0.16	9.49	0.00
Sex: M	-0.21	0.11	-1.88	0.06

Table 4.17: Fixed effects, with animacy and subject length

	Resid. Df	Resid. Dev	Df	Deviance	Pr(>Chi)
1	1593.00	2004.92			
2	1592.00	1999.99	1.00	4.93	0.03

Table 4.18: LRT: model0 without subject length, model1 with subject length

To be as conservative as possible, I also subset out non-wh NP subjects (N=443). Of these, 55% (N=246) are inanimate. Table 4.19 demonstrates that both animacy and subject

length are still significant effects. The LLRT in Table 4.20 confirms that the model with both animacy and subject length is better than a model without (or a model with only one of these effects).

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-1.99	1.23	-1.62	0.11
Animacy: human	-0.83	0.33	-2.48	0.01
log(subjleng)	-0.82	0.35	-2.36	0.02
Age	0.17	0.08	2.07	0.04
Formality: formal	2.72	0.55	4.97	0.00
Sex: M	-0.28	0.39	-0.70	0.48

Table 4.19: Animacy and NP subjects (N=443)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model0	8	496.80	529.01	-240.40	480.80			
model1	9	493.05	529.28	-237.53	475.05	5.75	1	0.02

Table 4.20: LLRT on non wh- NP subjects: model0 without subject length, model1 with subject length

Now I have a curious conundrum where subject length and animacy effects act differently in relation to one another in verbal -s than they do in MAE contraction. In MAE contraction, higher subject length conditions less contraction, while animate subjects condition more contraction. In verbal -s, higher subject length conditions less verbal -s, and animate subjects likewise condition less verbal -s. I return to this difference in Chapter 5 and discuss possible implications for locus of the animacy effect in grammar or processing.

4.6.2 Non-effects: Subject frequency

One possible explanation for the animacy effect could be that animate subjects are more frequent, and that frequency is the true conditioner of variation. Given that frequency,

although a significant but small effect on MAE contraction, did not change the animacy effect, I do not expect frequency to alter the core of our findings. However, it is important to check this, and our results are in line with what we would expect, where frequency does not replace the animacy effect. In fact, frequency does not have a significant effect at all, as is demonstrated below. Neither the frequency of the subject head nor the frequency of the verb itself appears to have any effect on the variation in verbal -s in this data.

In Table 4.23 I replace animacy with subject frequency as a fixed effect, in order to compare the resulting models with an LLRT (Table 4.22). If animacy were entirely epiphenomenal of a subject frequency effect, I would not expect either model to outperform the other. Instead, we see that the model with just animacy is significantly better than the model with just subject frequency. However, this does not necessarily mean that frequency³, defaultness, or markedness is not playing an important role in the animacy effect, but that these measures are not capturing that effect. Below I further discuss subject frequency, and in Chapter 5 I discuss these issues at more length.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-2.33	1.01	-2.30	0.02
subj.freq	-0.01	0.02	-0.62	0.53
log(subjleng)	-0.43	0.30	-1.42	0.16
Age	0.17	0.07	2.59	0.01
Formality: formal	2.61	0.40	6.44	0.00
Sex: M	-0.71	0.37	-1.92	0.06

Table 4.21: Model without animacy, with subject frequency

³It is possible that frequency of subject verb collocations, or other types of expectedness by frequency, may have an effect on verbal -s. I leave this question to future research.

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
mod.freq1	9	788.72	829.27	-385.36	770.72			
mod.freq0	9	776.04	816.59	-379.02	758.04	12.68	0	0.00

Table 4.22: LLRT where model1 has subject frequency instead of animacy, while model0 has just animacy

In Table 4.23, subject frequency is added to the model with animacy. However, at $p=0.45$ it is nowhere close to reaching significance (and even if it were, the coefficient is a marginal -0.01). The LLRT comparing the model without subject frequency to the model with it demonstrates that there is no significant improvement on the model when subject frequency is added (Table 4.24). It is possible that this may be the result of a small data problem, or that mixing NPs with pronouns as subject heads is affecting the results. I test just NP subject heads ($N=421$) and find the same results, where subject frequency does not affect the model.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-1.47	1.01	-1.45	0.15
subj.freq	-0.01	0.02	-0.75	0.45
Animacy: human	-1.02	0.28	-3.67	0.00
log(subjleng)	-0.64	0.28	-2.29	0.02
Age	0.16	0.07	2.41	0.02
Formality: formal	2.42	0.40	6.09	0.00
Sex: M	-0.73	0.36	-2.02	0.04

Table 4.23: Subject frequency and animacy

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
mod.freq0	9	776.04	816.59	-379.02	758.04			
mod.freq1	10	777.47	822.53	-378.73	757.47	0.57	1	0.45

Table 4.24: LLRT of model0 without subject frequency and model1 with subject frequency

4.6.3 Non-effects: Verb frequency

Some verbs may be more likely to have animate subjects than others. There are 113 unique verbs in this dataset

Just like with subject frequency, I tested verb frequency alone without animacy as a factor. The model with just animacy significantly outperformed the model with just verb frequency (Table 4.25). Verb frequency does not reach significance when added to the model with animacy (Table 4.26, nor does it significantly improve the model (Table 4.27). Finally, verb frequency was equally unimportant in models that looked exclusively at NP subjects as models that included both pronoun and NP subjects.

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
mod.freq2	9	785.69	826.24	-383.84	767.69			
mod.freq0	9	776.04	816.59	-379.02	758.04	9.64	0	0.00

Table 4.25: LLRT where model2 has verb frequency instead of animacy, while model0 has just animacy

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-0.71	1.19	-0.60	0.55
verb.freq	-0.09	0.07	-1.32	0.19
Animacy: human	-0.94	0.28	-3.36	0.00
log(subjleng)	-0.59	0.27	-2.20	0.03
Age	0.16	0.06	2.41	0.02
Formality: formal	2.38	0.40	6.02	0.00
Sex: M	-0.71	0.36	-1.97	0.05

Table 4.26: Verb frequency added to the model

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model0	9	776.04	816.59	-379.02	758.04			
model3	10	776.32	821.38	-378.16	756.32	1.72	1	0.19

Table 4.27: LLRT: model0 without verb frequency, model3 with verb frequency

4.7 Ruling out alternative explanations

4.7.1 Style

We know from multitudes of research on verbal -s that verbal -s variation in AAVE is subject to style shifting and codeswitching, and to class, sex, contexts, audience, and topic differentiation, among many others. Here, I demonstrate that animacy effects are still present in both informal and formal contexts, and therefore not due to stylistic context. First, I describe the dataset with regard to formality, and possible confounds in the data. Then, I demonstrate that the animacy effect is still significant and robust even when controlling for style.

There are far fewer verbal -s tokens in formal contexts (N=316) than in informal contexts (N=1398). This is partly due to fewer words transcribed for formal contexts in general. Furthermore, formal contexts have far fewer deleted verbal -s: in formal contexts, only 19% of the tokens are null, while in informal contexts, 55% of the tokens are null.

Furthermore, formal contexts in this dataset are less likely to contain discussion of animate subjects: 48% of verbal -s tokens have animate subjects in formal contexts, as opposed to 73% animate subjects in informal contexts. Thus, there is a confound between animacy and formality. Given that animate subjects are more likely to have null than inanimate subjects, and that informal contexts are also more likely to elicit null tokens, the animacy effect could feasibly be an artifact of formality. To control for formality, I subset into just informal, and just formal, subsets, and reran the same models as in the basic animacy effect in the previous section. Tables 4.28 and 4.30 show that animacy is still a robust and significant effect, even when style is controlled for (informal and formal subsets, respectively). The LLRT's in Tables 4.29 and 4.31 demonstrate that informal and formal models (respectively) are significantly improved by adding animacy as a factor.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.04	0.42	0.10	0.92
Animacy: human	-1.07	0.18	-5.97	0.00
Age	0.03	0.03	1.18	0.24
Sex: M	-0.15	0.25	-0.61	0.54

Table 4.28: Animacy effects in informal contexts (N=1398)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model0	6	1553.81	1584.76	-770.91	1541.81			
model1	7	1543.62	1579.73	-764.81	1529.62	12.20	1	0.00

Table 4.29: LLRT: model0 without animacy, model1 with animacy, in informal contexts

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	2.61	1.30	2.01	0.04
Animacy: human	-1.28	0.49	-2.62	0.01
Age	0.06	0.09	0.70	0.49
Sex: M	-1.16	0.59	-1.95	0.05

Table 4.30: Animacy effects in formal contexts (N=316)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model0	6	295.06	317.56	-141.53	283.06			
model1	7	288.13	314.37	-137.06	274.13	8.94	1	0.00

Table 4.31: LLRT: model0 without animacy, model1 with animacy, in formal contexts

4.7.2 Age

This effect is significant throughout the age groups in the dataset, from ages 4-16. The lack of distinction between ages may indicate that the conditioning factor of animacy (if it is internal to the grammar rather than a processing effect), is acquired before age 4.

One interesting question is about the acquisition of the animacy effect. Is it a complicated enough effect that it is acquired late? Likewise, speakers of all ages should demonstrate the animacy effect as well.

I investigate if there is evidence for when this conditioning effect is acquired by looking at the age distributions of speakers (ages 4-16) and if the animacy effect is evident across ages. Unfortunately, there is less data in general from speakers under age 12, and there is an additional effect (discussed in Van Hofwegen & Wolfram) of an extreme decrease in null verbal -s from ages 7-9.

There are no inanimate subjects at age 11. Also note that at earlier ages, it is unclear if the animacy effect is still important. From the raw data in Figure 4.1, it appears to be trending in that direction. When models are run on ages 4-9 (N=264), animacy is significant but with a high p-value at $p=0.05$ (Table 4.32) Note that sex is not included, because the model is not significantly better with sex than without. When comparing a model with and without animacy, the model with animacy is barely significantly better, again with a p-value of 0.05 (Table 4.33). These p-values indicate that there is either not enough data here (quite likely), and/or that the animacy effect is weaker in younger ages. Note that formality is not taken into account in this chart of the raw data, indicating that the animacy effect is strong enough to come through even without controlling for style.

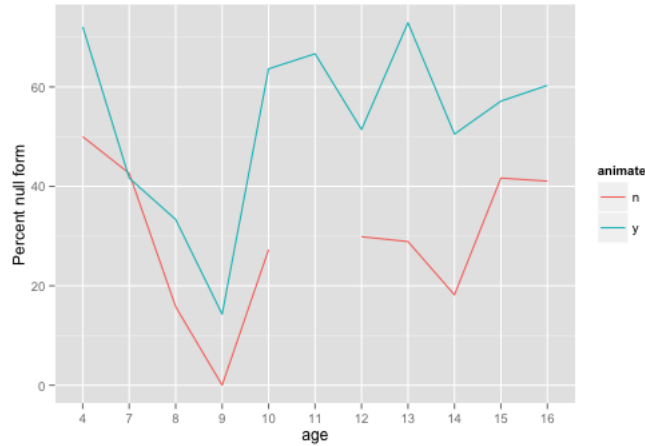


Figure 4.1: Percent absence of verbal -s by animacy across age

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-2.94	0.92	-3.19	0.00
Animacy: human	-0.72	0.36	-1.98	0.05
Age	0.56	0.13	4.20	0.00

Table 4.32: Animacy effects in ages 4-9 (N=264)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
model0	5	309.62	327.50	-149.81	299.62			
model1	6	307.82	329.28	-147.91	295.82	3.80	1	0.05

Table 4.33: model0 without animacy, model1 with animacy

Animacy is a robust and significant predictor of verbal -s variation, without interaction with style or sex. This supports my argument that **animacy effects are either rooted in the grammatical structure itself, and/or in extra-grammatical processing effects, but not contained in style shifting or codeswitching.**

4.8 Conclusion

In addition to revealing the animacy effect and demonstrating that, unlike previous quantitative predictors for verbal -s, animacy is not in the social domain, I also demonstrate an additional non-social effect: subject type.

Chapter 5

Implications of animacy conditioning

As we have seen, animacy effects account for a great deal of variation in English. However, what is left open is *how* and *why* animacy affects these case studies. Is it possible to unify these patterns into a single, generalized explanation? Furthermore, is it possible to expand that generalization to patterns seen in other languages and other domains? Animacy effects in English link properties of the subject to markings on the verb, therefore this chapter details contemporary analyses for how subject properties are linked to verb properties, including analyses from domains as diverse as linguistic typology, psycholinguistics, and neurolinguistics. Depending on the theoretical framework, inanimate subjects are viewed as non-default, non-canonical, marked, unexpected, containing more information, etc., but *no* framework views inanimate subjects as the norm in non-specialized contexts (Becker, 2014), which is an assumption I will refer back to repeatedly. While conclusive answers to how and why animacy affects variation are not possible with the types of datasets used here, it *is* possible to point to research questions and interpretations that are either compatible or incompatible with my results, and to propose future investigation into specific areas.

5.1 Semantic vs. syntactic animacy

Here I test if animacy in these case studies is semantic or syntactic. Animacy in the semantic sense is generally predictable from observable facts of biology. Furthermore, we know that children from a very young age categorize the world according to living versus non-living entities (Opfer and Gelman, 2010). At the edges of these systems, however, there is sometimes arbitrary categorization, which also maps onto similar categories of referents. In such languages, animacy status is unpredictable and lexically encoded. In other words, for any given word, it may not be predictable from biological animacy where that item falls in the animacy hierarchy. This type of animacy is actual a noun categorization, along the lines of grammatical gender. Although we have no reason to believe that there is extensive noun categorization of this type in English, there are ambiguous cases where one possibility that should be considered is that ambiguous cases, such as *one*, or *they* may not be categorized by their semantic referent but instead arbitrarily categorized as animate or inanimate. If any of these subject heads are arbitrarily categorized, that would be evidence for animacy being lexical or syntactic, rather than semantic.

To preliminarily test whether such tokens are conditioned by semantic versus syntactic animacy, I turn to the case study with the most possible tokens – MAE contraction of *is* – and subset tokens with *one* as the subject head. The structure of the coded data from the corpus does not allow the analyst immediate access to non-adjacent discourse, therefore I select tokens where the semantic referent is clear from the immediate context.

There are 61 instances of *one* as the subject head. Of these, 11 are ambiguous with regard to animacy, and 41 are decipherable from the immediate context. If the referent to *one* is included in the previous sentence, it is clear if it is animate or inanimate. For instance, in (31), *library* is the referent, and is inanimate. In (32), the referent is talked about later in the sentence, and is coded as inanimate (*a smokers' survey*).

(31) I'm kind of sort of surrounded I've got three different libraries that are within oh I don't know it's uh ... I guess the furthest one away is maybe two miles one of them's only about a half mile away the other one's about a mile and a half.

(32) ... one of them is supposed to be a smokers survey ...

From the raw data in Table 5.1, we see that there may be a large effect of animacy on these, but that the small number of tokens makes this finding preliminary and in need of further investigation. Due to the small dataset, a more complicated model is not possible, but a Chi-square test indicates that there is a significant difference between contraction rates across animacy categories (Chi-square = 5.55, $p=0.02$).

Animacy	Percent contracted	Contracted	Full	Total
inanimate	21%	6	23	30
animate	58%	7	5	12

Table 5.1: Raw data distribution of *one* as a subject head by animacy of its referent and contraction rates

This analysis is dealing with animacy from the production side. There are interesting connections to be made with the comprehension and parsing element of animacy and language. For instance, it is controversial in the psycholinguistic literature exactly when animacy plays a role in English processing and production. One analysis is that animacy is available for semantic interpretation, but not for the initial syntactic parsing (Frazier, Lyn, and Janet Fodor, 1978, Ferreira and Clifton, 1986). This is contrasted with interactive, constraint-based models where animacy affects the initial parsing because both semantic and syntactic information is available at that early stage (cf. Trueswell and Tanenhaus, 1994). A further avenue of research could be to incorporate these newfound animacy effects into processing studies.

Thus, evidence from *one* as subject head indicates that, even though animacy condi-

tioning affects morphosyntactic selection, it is based on semantic reference. This may be productive in future psycholinguistic studies investigating the role of animacy in parsing.

5.2 Animacy as more than universal processing

An empirical question is whether animacy can be reduced to a high level processing effect, such that animacy effects in English are consistent, predictable, and match cross-linguistic patterns. In other words, can animacy be reduced to extra-grammatical, universal processing mechanisms, in which case it would not need to be specific in the discussion of variation English (Wolfram, 1975). In this section I describe relevant theoretical frameworks and assess the predictions they make for these case studies, assuming that inanimates are easier to process than animates. I argue that the case studies here are not satisfactorily predicted from universal mechanisms.

5.2.1 Prototypicality

In theories using **prototypicality** and **prominence hierarchies**, the subject and the verb are linked by the hypothesis that non-canonical subjects prefer more marking on the verb (originally discussed in Silverstein, 1976). This assumes that 1) there is such a thing as a non-canonical subject; and 2) verbs can be “more” or “less” marked. For the present case studies, these assumptions are extended to: 1) inanimate subjects are non-canonical subjects; and 2) the full and overt forms of each variable are more marked than the reduced or null forms.

Under the assumption that inanimate subjects are non-canonical, and therefore prefer “more” marked verbs, the basic animacy results in these case studies match the predictions made by prototypicality accounts. Non-canonical, inanimate subjects, prefer full auxiliaries for MAE contraction, full copula for AAVE copula contraction/deletion, and overt -s

for AAVE verbal -s. However, a problem for the prototypicality analysis is the definition of “more” versus “less” marked, and whether this is a binary versus gradient concept. The prominence prediction for AAVE copula is that inanimates should prefer the three possible copula variants on a hierarchy of more to less marked, such that inanimate subjects would prefer full > contracted > deleted. Instead, inanimate subjects prefer the full form in contrast to both reduced forms. A possible way out of this is to appeal to arbitrary grammatical structures, specifically Labov’s Contraction/Deletion analysis. However, such an account loses the universal quality of prototypicality predictions: why is prototypicality necessary when internally grammatical structures are the final explanation? Thus, for prominence predictions to work, there needs to be a binary between marked versus non-marked verbs that is not dictated by phonological content alone. At this point, the reasoning can become circular, and the predictive value of prominence for this specific location starts to break down.

Another theory that utilizes prototypicality is **Uniform Information Density** (UID), which argues that it is rational for speakers and listeners to maintain a uniform transmission of information over speech in real time (Frank and Jaeger, 2008). This predicts that spikes of high information content, as operationalized by unexpectedness, will be followed by words with low information content. The UID literature makes the assumption that reduced or deleted forms are higher in information density, and are therefore less likely to occur when preceded by unexpected words. MAE auxiliary contraction of *is* and *have* have been previously analyzed in this context, with two pieces of evidence for UID: 1) contraction is less likely when the auxiliary is more unexpected from the previous context; and 2) contraction is less likely when the following context is more unexpected (Frank and Jaeger, 2008). Could this type of reasoning give an explanation for animacy effects?

Under a UID interpretation, the unexpected form of the subject, the inanimate subject, is higher in information content than the animate subject, and thus is expected to be fol-

lowed by unreduced forms. This is indeed the case for each of the three case studies, with the same problem described above for prominence theories – UID predicts a contrast between contracted and absent forms in the AAVE copula, but no such contrast exists. If, as the literature describes, full auxiliaries have lower information density than reduced auxiliaries, then a variant that is lacking any phonological form (the AAVE null copula), should have the highest information density of all the forms. Thus, while UID makes accurate predictions for the majority of these variables, it does not predict the animacy conditioning on AAVE copula.

Role prototypicality has also been analyzed as producing specific ERP responses. For instance, Bornkessel-Schlesewsky & Schlewsky contrast English, German, and Chinese, which were believed to not have grammatical animacy effects, with Tamil, which case-marks objects differentially by animacy (2009). Because speakers of all four languages evidence N400 responses (associated with semantic mismatches) to inanimate subjects, Bornkessel-Schlesewsky and Schlewsky argue that inanimate subjects are atypical cross-linguistically, and furthermore that “the brain’s reaction to a particular dimension of prominence is independent of that dimension’s language-specific weighting/degree of grammaticalisation” (2009:34). They use this as evidence for semantic information of prominence features like animacy being functionally equivalent to syntactic information.

However, with the new findings that animacy probabilistically affects English morphosyntax, it is can no longer be assumed that there is a clear distinction between English and Tamil regarding the morphosyntactic relevance of animacy. Perhaps the convergence of N400 effects across languages indicates not that prominence information produces neural responses regardless of grammatical relevance, but instead that animacy may be grammatically relevant in more languages than was previously thought. The discovery of animacy effects on English verbal paradigms implies that theories that assume that animacy is not morphosyntactically relevant in English need to be reassessed.

Testing prototypicality: Transitivity

Given that prototypicality is a possible source of the animacy effect (operationalized as “unexpectedness” by UID), it is necessary to investigate more extended types of prototypicality that can occur. One of these is transitive versus intransitive contexts, where a more specific version of prototypicality would predict that inanimate subjects in transitive contexts would be more likely to be overtly marked than inanimate subjects in intransitive contexts. However, this is not the case. This preliminary study on transitivity in verbal -s code transitivity on a binary scale, such that “transitives” are verbs that take an object argument, and “intransitives” are verbs that do not. Note that subject type is not included in the model, as there was no variation in this subset (all subjects were non-wh subjects). The prediction is that an interaction between transitivity and animacy should produce significant results if prototypicality of the entire argument structure is the source of the animacy effect. This is based on the concept that there should be a “boost” to the rate of overt marking when atypical subjects (inanimates) are also in argument structures that are atypical for inanimate subjects (transitives). However, there no significant effect of transitivity, nor of the interaction between transitivity and animacy, (Table 5.2), and adding transitivity does significantly improve the original model in an LLRT. Therefore, prototypicality does not appear to make accurate predictions when expanded to include transitive/intransitive argument structures.

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.20	0.57	0.35	0.73
Animacy: animate	-1.15	0.39	-2.94	0.00
Intransitive	-0.14	0.39	-0.35	0.73
Age	0.03	0.03	0.91	0.36
Formality: formal	2.04	0.25	8.15	0.00
Gender: M	-0.23	0.26	-0.87	0.38
Interaction: animates & intransitives	0.10	0.44	0.23	0.82

Table 5.2: Transitivity in model (N=1329)

Another testing point for prototypicality predictions is subject and object relationships within transitive contexts, under the assumption that the prototypical subject is animate, and the prototypical object is inanimate (Comrie, 1989). The prediction for overt marking, from highest to lowest, is: inanimate subject/animate object > inanimate subject/inanimate object > animate subject/animate object > animate subject/inanimate object. If we extend UID to make predictions for objects like its predictions for subjects, then deviations from prototypical transitive structures would be unexpected, transmit higher levels of information, and be preceded and followed by less reduction.

However, neither of these predictions are met by the preliminary data presented here. In a subset of transitive verbs (N=287), there is no significant effect of object animacy, nor an interaction between subject animacy and object animacy. In further subsets comparing animate subjects with animate versus inanimate objects, and inanimate subjects with animate versus inanimate objects, there is no effect of object animacy.

One possible explanation for these non-effects of transitivity and object animacy is that in English, there is a relationship between subjects and verbs through subject-verb agreement, but no relationship in which object properties affect verb marking. Thus, prototypicality predictions for languages with ergative and split ergative systems include transitivity and object relationships, while prototypicality predictions for languages like English in-

clude subject-verb agreement but not transitivity or object effects. One implication of these results is that animacy effects do not reflect generic prototypicality – even though canonical argument structures for transitive constructions have animate subjects and inanimate objects, deviation from this canonical form does not appear to influence morphosyntactic selection. This result converges with the non-effects of subject frequency and verb frequency in verbal -s, indicating that higher-level abstractions of frequency and prototypicality do not appear to be causing the animacy effect. This case study has implications for UID, which, under this implementation of expectedness, inaccurately predicts that unexpected objects would influence morphosyntactic selection.

5.2.2 Processing load

Is this just codeswitching?

One of the central questions in AAVE research, and the study of the linguistic variable in general, is whether or not variation stems from codeswitching¹ rather than internal grammatical constraints (Wolfram, 1975). In this section, I assume that processing load can decrease codeswitching ability, and use this as a diagnostic for whether animacy conditioning could be related to codeswitching rather than inherent variability.

Previous research has indicated that there may be increased cognitive load for AAVE speakers in processing the standard (overt) variant of verbal -s (Terry et al., 2010). This interpretation argues that dialect switching produces a variable cognitive load that adversely affects some AAVE speakers' performance on math tasks written in MAE. This analysis is in line with previous research that high levels of AAVE features correlates with poor test scores, while codeswitching ability between AAVE and MAE is correlated with increased performance (Craig and Washington, 2006). Here I unpack if a cognitive load interpretation

¹Note that this explanation would be unsatisfying with regard to MAE contraction, where no one claims that full and contracted forms are in separate grammars.

can account for the animacy effect, and find that the predictions go in the opposite direction from my results.

In order for cognitive load to account for animacy effects, either inanimate or animate subjects need to be interpreted as increasing cognitive load. The subject type with higher processing load would then be predicted to occur with the variant associated with less cognitive “work,” while the lower processing load subject type would leave more processing effort available for the more difficult variant. Terry et al. interpret verbal -s presence as the variant associated with increased work, thus for this extension to be convincing, the subject type that prefers verbal -s presence should be the one associated with less processing work. However, this is not the case. Inanimate subjects, not animate subjects, are associated with verbal -s presence. Unless we want to analyze inanimate subjects as lower processing work, which would be undesirable due to the preponderance of evidence that inanimate subjects are more difficult to process than animate subjects, then we cannot apply codeswitching cognitive load effects to our explanation of the animacy effect.

This highlights an important point regarding codeswitching and animacy effects, that further supports animacy effects as evidence of underlying -s in AAVE. For any given standard variant used in natural speech by an AAVE speaker, it is currently implausible to confidently identify if the source of that variant is codeswitching in a diglossic context, style shifting within AAVE grammar, or simply the use of that variant from within the AAVE grammar itself. While I do claim that the standard variants in both AAVE copula and AAVE verbal -s are underlyingly part of AAVE grammar, I do *not* claim that every use of a standard variant is from this specific providence. In other words, hypercorrection and codeswitching may still be occurring and affecting verbal -s rates. Crucially, however, any impact of those would function as noise as far as animacy-based variation is concerned. **The fact that there are clear animacy effects despite such potential noise further bolsters that the conditioned variation relates to something real in the language, which I**

argue is the underlying status of overt -s in AAVE.

Testing processing load: Subject length effects

Given that subject length effects are analyzed as online processing (MacKenzie, 2013), they allow us to compare and contrast these case studies with regard to processing load. Tables 5.3-5.5 give raw token counts by subject length for each variable. Note that the number of tokens for one-word subjects in verbal -s is boosted by including pronouns. However, pronoun status does not condition verbal -s, and subject length effects are still significant for verbal -s when tested on a subset of 382 NP subjects, therefore including them is justified. I present the results here with the caveat that, for AAVE copula contraction/deletion, there may not be enough tokens nor enough of a range of subject lengths for more than a preliminary analysis of subject length effects across all three case studies. However, there are sufficient tokens for MAE contraction and AAVE verbal -s.

Words in subject	Contracted	Full
1	97	73
2	279	332
3	43	91
4	11	50
5	8	26
6	3	27
7	1	14
8	1	9
9	0	7
10	0	7
12	0	3
13	0	1
14	0	1
15	0	1
16	0	3
18	0	1

Table 5.3: Token count of MAE *is* variant by subject length

Words in subject	Zero	Contracted	Full
1	17	7	60
2	53	12	21
3	2	0	13
4	0	0	1
6	1	0	0
8	0	0	1

Table 5.4: Token count of copula variant by subject length

Words in subject	Null	Overt
1	678	734
2	101	94
3	26	39
4	11	14
5	4	2
6	7	2
7	0	2
8	1	1

Table 5.5: Token count of verbal-s variant by subject length

The key finding about subject length effects is that AAVE verbal -s and copula go in the opposite direction from MAE contraction. In MAE contraction, longer subjects prefer the full form. In both AAVE variables, longer subjects prefer the null form. This is a crucial point in analyzing if animacy is a grammatical or a processing effect. If animacy effects were a type of processing effect resulting from processing load, then it would be reasonable to predict that animacy effects would go in the same direction as a known processing effect like subject length. However, **animate subjects prefer reduction across all three case studies, but subject length effects are not parallel across studies**: longer subjects prefer reduction for AAVE variables while preferring the full form for MAE.

5.2.3 Style

The stylistic categories in this dissertation are coarse, and, while they serve the purpose here of testing animacy within different stylistic contexts, they do not allow us to test animacy with an eye toward finer-grained stylistic conditioning. I briefly discuss some possibilities for how animacy and style may be intertwined, and possible ways to disentangle them.

Microstyle can be defined as the social context surrounding a specific token, rather than the social context surrounding an entire interview (which I will refer to as macro style, and is how the formality conditioning in this dissertation is described). Microstyle may capture far more nuanced distinctions, such as topic-based stylistic shift (Rickford and McNair-Knox, 1994), or a shift in audience or perceived audience (Bell, 1984). It may even capture the intuition that animate subjects are more basic, default, or casual, than inanimate subjects. If this is the case, then animacy may be a fantastic stand-in for such micro style effects, but it becomes increasingly hard to unpack whether the source is animacy itself or micro style more broadly. However, there has been no indication or pattern in the data suggesting that micro style is the source of this animacy effect. For instance, in casual contexts, there may be no intuitive difference between pronouns *he*, *she* and *it* in terms of stylistics, but this difference remains apparent in animacy effects. Similarly, a subject like “the teacher” is a thematically more formal than “the boy”, and yet still patterns within the category of animate subjects. This could, however, be the result of insufficient tokens of this type, that, because they are from natural speech, are insufficiently controlled. One way to test this could be in a targeted psycholinguistic study controlling for audience, topic, etc., while varying animacy, to determine if, within the most controlled possible micro style context, animacy continues to have an effect. If it does not, this may have serious implications for animacy effects cross-linguistically, and would imply much stronger connections between style, grammar, and processing, than is currently thought.

5.2.4 Is structure necessary?

One possibility is that animacy processing constraints apply to language regardless of the underlying structure. This would predict that animate entities condition reduction across-the-board, without reference to the role of that entity in the argument structure. One way to test for this is to pinpoint the study of *is*, which we has the largest token count, and investigate if there is an effect of animacy of nouns that are closer to the verb than the subject.

The subset of the 1089 tokens of *is* with NP subjects was further subsetted to subjects with nouns intervening between the head and the auxiliary that were clearly animate or inanimate, leaving 166 tokens. However, the range of words in these subjects is 3-18, with a mean of 6 words in the subject. This is already well beyond the number of words for short allomorphy to be unlikely, and this is evidenced in the short allomorph rate of only 13% for this subset (as opposed to 40% for the entire set of NP subjects). The data is also skewed such that there are few animate heads with intervening nouns (see Table 5.6). I ran mixed effects models on this entire set together, and while animacy remained a significant and robust predictor, the animacy of the intervening noun did not affect the model.

	Intervening animate	Intervening inanimate
Animate head	9	10
Inanimate head	71	76

Table 5.6: Distribution of head animacy and intervening noun animacy

Even if there were results of intervening nouns, it would not necessarily indicate that animacy was not structurally-based. In MAE subject-verb agreement, nouns intervening between the subject and verb can cause “attraction” effects such that the verb agrees with that noun rather than the subject (Bock and Miller, 1991). Although subject-verb agreement is obligatory in MAE, it is sometimes not followed due to processing errors. Thus, if we had

a larger dataset, we might expect some effects from the animacy of any noun that linearly intervenes between the subject head and the auxiliary, particularly if there is an animacy mismatch between the intervening noun and the subject head. Thus, there is no evidence that animate entities affect lenition without regard for linguistic structure.

For instance, Bock and Miller found that errors are more common after plural than after singular local nouns, a phenomenon which they call attraction. In both observed and experimentally elicited errors, between 80 and 90% of the errors follow plurals, as in 33 (Bock and Miller, 1991, Pearlmutter et al., 1999).

(33) The time for fun and games **are** over. [Bock & Miller 1991: 46]

It would be interesting to investigate this further with either larger corpus studies or detailed psycholinguistic studies. It is possible that additional data would demonstrate a processing effect of “agreeing” with the animacy of the intervening noun rather than the head noun, especially combined with memory tasks to increase processing load. Because the intervening effect in subject verb agreement is for a categorical variable in MAE, it would be interesting to test for analogous effects in a probabilistic alternation.

5.3 Evidence for default variants

One of the possible explanations for differences across subject length effects is that there is some notion of “default” in the grammar, and in morphosyntactic variation produced by the grammar. This assumes that every variable has an arbitrary default that takes less cognitive processing to produce than the other possible variants. I investigate what the defaults could be for each case study using subject length effects, and for AAVE verbal -s in particular using persistence effects.

Subject length effects

One possible interpretation of subject length effects is that longer subjects produce higher cognitive load, and that under the context of higher load, the grammatical default for a variable is more likely to occur. Under this assumption, we can use results from subject length effects across case studies to point to possible defaults in each variable. In MAE contraction, the longer the subject, the more likely the full form. Thus, the interpretation from the assumptions above is that the full form is the default for MAE auxiliaries. This contrasts with AAVE copula², where the longer the subject, the less likely the full form is. The interpretation is that the reduced forms, contracted and deleted, are the default for AAVE copula. AAVE verbal -s results are parallel to AAVE copula, such that longer subjects prefer the null variant. These results may point to a critical contrast in the underlying grammars of AAVE and MAE, such that the default variants are different, even in similar variables conditioned by parallel constraints.

Persistence

Another way to analyze possible default status is to investigate the effects of persistence of each variant. Persistence effects³ may be a useful diagnostic of variants that are underlying in the grammar (Tamminga, 2014). I demonstrate that verbal -s is persistent, and present this as evidence that both the overt and null variants are stored in the grammar as variants of verbal -s. Secondly, under the assumption that variables have default forms, I use persistence as a possible diagnostic for identifying the default variant.

Many linguistic variables are conditioned by persistence, or the tendency to reuse a recently-used variant. The data here is from 583 interviews with African American children

²It would be interesting to investigate if there is similar the patterning of *will* and *has* in AAVE, which, like copula, can be full, contracted, or deleted.

³The analysis of persistence in this dissertation represents joint work with Meredith Tamminga, some of which is presented in Tamminga and McLaughlin, 2013, and in Tamminga, 2014. Any errors are my own.

in the Frank Porter Graham Corpus. To measure persistence, each token (target) is coded for the presence or absence -s in the previous token (prime), and the distance between target and prime in orthographic words. Persistence of primes and targets was coded by tagging every token of verbal -s presence/absence with the value of the previous token of verbal -s. Previous tokens were not coded across interruption by interlocuter.

Persistence strength is calculated as the following: for any given subset, relative change with respect to the unprimed variant is the equation in Figure 5.1.

$$\text{persistence strength} = -\log \left(\frac{\text{subset (primed) rate}}{\text{baseline (unprimed) rate}} \right)$$

Figure 5.1: Equation for persistence strength

Figure 5.2 shows that third singular -s (N=1773) is subject to a robust persistence effect. The upper line shows that previous absence of -s depresses the probability of using -s subsequently, while the lower line shows that the previous presence of -s increases the probability of subsequent -s. Persistence decays over distance from the prime, as shown in the x axis, which displays the number of orthographic words between the prime and the target. These results indicate that verbal -s is subject to persistence effects, and, under the assumptions previously described, indicates that both variants are encoded in the grammar.

These results may also point toward a default variant. Note that at approximately the 50 word lag mark on the x axis, the line representing the null prime plateaus, while the line for the overt prime continues to dive until it converges with the null prime. Rather than converging at the average baseline (the dotted line), null -s appears to be the preferred form. I propose that this supports the default status of the null variant, particularly when combined with the results of the subject length effect.

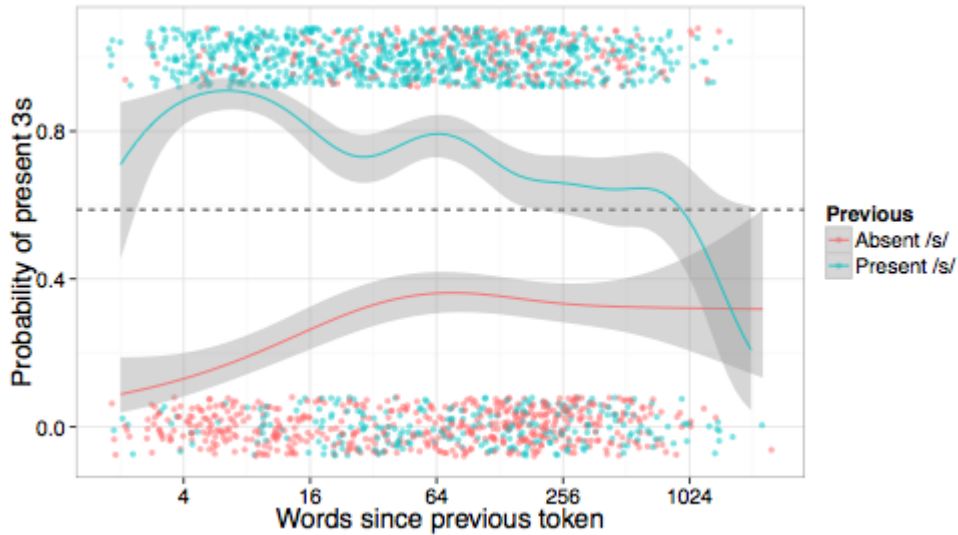


Figure 5.2: Persistence of 3sg -s by lag distance

The convergence of subject length and persistence results toward the null variant of verbal -s being the default is also compatible with other studies. For instance, it predicts results such as Terry et al.'s, in which higher rates of overt -s are cognitively taxing for some AAVE speakers. However, this would also predict that overt copula would also be taxing in similar ways, which Terry et al. tested for but did not find. More specific research is necessary on the interaction between working memory load, subject length, and possible default variants. The possible existence of default variants that are arbitrary and language specific indicates that attempts to universally predict effects on variation still need to appeal to a basic notion of language-specific grammars.

5.4 Animacy and inverse frequency effects

Animacy effects can also contribute to the study of the relationship between linguistic constraints and processing effects. Here, animacy conditioning sheds light on more detailed persistence effects, and answers previously outstanding questions about the nature of gram-

grammatical context on frequency effects.

Factors that determine the strength of the persistence effect include: (1) inverse frequency; and (2) similarity between the prime and target. The inverse frequency effect is such that the less-frequent variant more strongly promotes its own reuse, and has been identified experimentally and in corpus data (Ferreira, 2003, Szmrecsanyi, 2006, Jaeger and Snider, 2007). It has not been previously tested, however, whether the inverse frequency effect reflects which variant is less frequent *overall* or which variant is less frequent *within a linguistic context*. To answer this question, this section investigates if the inverse frequency effect is sensitive to the grammatical conditioning of a variable by looking at persistence effects across animacy conditioning in AAVE verbal -s. I demonstrate that this variable is persistent in a way that shows contextual sensitivity to the effect of animacy on -s realization. Furthermore, the inverse frequency effect depends on the context of the prime rather than that of the target. Similarity, the second boost for persistence effects, can be operationalized as lexical similarity between the prime and the target, as well as contextual similarity between the prime's context and the target context's context. I investigate if persistence strength is increased by overlaps in the grammatical context, and find evidence that this is the case. Most importantly in the context of this dissertation, animacy effects condition persistence both in terms of inverse frequency effects and in terms of similarity boosts. The predictions based on animacy effects and on previous work on persistence and processing effects are supported by the results presented here, giving us confidence that the animacy effect intersects with other cognitive mechanisms.

As we see in Figure 5.3, there is a strong animacy effect on verbal -s, such that animate subjects have approximately 50% overt -s, while inanimate subjects have approximately 75% overt -s. The inverse frequency prediction is that the rare variant, given the prime's subject type, should be facilitated more strongly in the target variant. Animate subjects do not favor one variant over another, as both null and overt -s occur at approximately the

same rates. Therefore, persistence effects for each variant will be equivalent after animate primes. Inanimate subjects, in contrast, *do* favor one variant, the overt -s (Figure 5.3). Therefore, the prediction is that there will be increased priming after inanimate primes with the minority variant, the null form. The prediction regarding the lexical boost effect is that there should be greater persistence in cases where the prime and target overlap in subject animacy than in cases where they do not. These predictions are borne out, as described below.

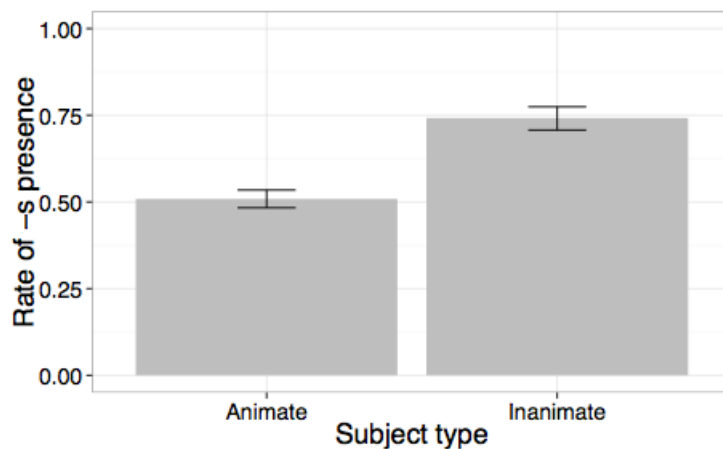


Figure 5.3: Basic animacy -s rates (N=2345)

The results are split by the animacy of the subject in the prime. In Figure 5.4, we see that when the prime has an animate subject, the persistence effects are equivalent. In other words, within animate targets, previous null and previous overt are approximately equal distance from the mean. Within inanimate targets, the same holds. These results are line with our expectations that the equal rates of each variant for animate primes would produce equivalent persistence effects.

In contrast, tokens with inanimate primes have asymmetrical rather than equivalent persistence effects (Figure 5.5). The expected variant, overt -s, does not produce strong persistence effects (note how close the confidence intervals are to the mean). In contrast,

tokens with previous nulls are more likely to also select null forms, especially when the animacy of the target is inanimate as well.

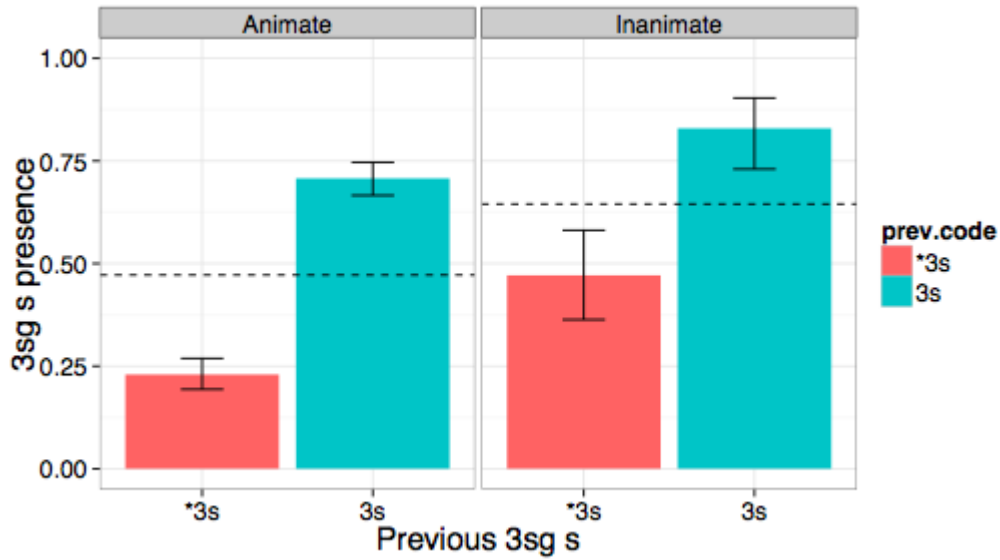


Figure 5.4: Effect of an animate prime on 3sg -s

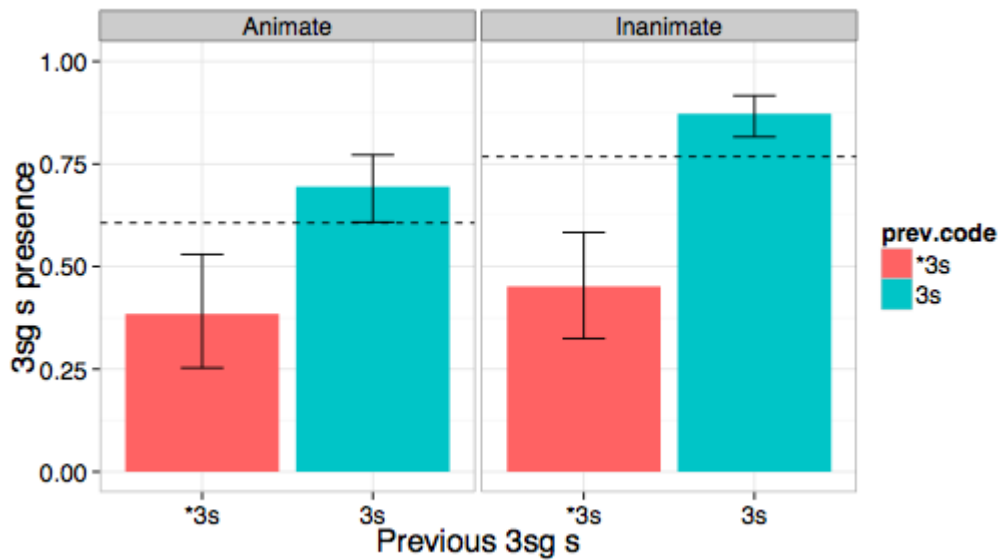


Figure 5.5: Effect of an inanimate prime on 3sg -s

This case study demonstrates that the persistence observed in this natural speech cor-

pus shares traits with experimental priming, namely, the inverse frequency effect and the similarity boost. We can see effects of psycholinguistic processing in the production of variation, and we can predict processing effects based on structural conditioning found in sociolinguistic variation. These findings are novel in several ways: persistence has not previously been documented for third singular -s or AAVE. Furthermore, this demonstrates the new finding that the inverse frequency effect applies at the level of conditioned variables. These results boost our confidence in the psycholinguistic reality of persistence as well as the validity of the animacy effect introduced by this dissertation.

5.5 Making connections across variables and varieties

In the study of comparative variation, parallel effects of a conditioning factor on multiple variables is often used as evidence of underlying grammatical connections (Wolfram, 1975, Tagliamonte, 2002). I argue that the parallel connections between MAE contraction, AAVE copula, and AAVE in Figure 5.6 can be interpreted as indicating grammatical connections between the three features, and possibly between MAE and AAVE.

In comparative sociolinguistics, shared constraints are interpreted as a window into shared underlying grammars, and thus shared origins (Tagliamonte, 2002). Should this data be interpreted as indicating shared underlying structure across these variables and varieties? I have argued yes and no. Yes, in that animacy is being employed in parallel ways by multiple variables in two different grammars. No, in that there is evidence that the default variants are different across these grammars. Thus, we have a situation where the underlying structures may be crucially different but share the conditioning factor of animacy. I present these results as relevant to the question of AAVE origins, but it is as yet unclear which origin is most compatible with shared animacy conditioning.

Further research is necessary to investigate if there are other animacy effects in En-

English and its varieties, as well as similar effects cross-linguistically. I argue that animacy effects cannot be reduced simply to a language-specific effect in English, due to animacy's prominence across the world's languages. Nor can animacy effects be reduced to universal processing, due to the inability of pure processing accounts to fully predict English morphosyntactic variation. Instead, I follow Becker 2014 in arguing that animacy effects are universally salient in human cognition, and therefore are utilized by language-specific grammars in structuring linguistic constraints. However, the differentiation between universal processing and specific language structure has yet to be fully defined.

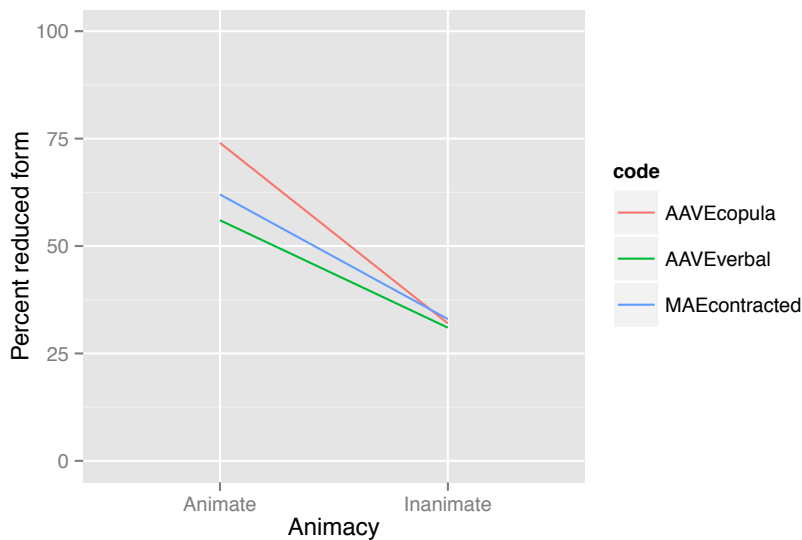


Figure 5.6: Parallel animacy effects across English morphosyntax

5.6 Conclusion

This dissertation demonstrates that, contrary to previous assumptions, animacy has a clear and robust effect on English morphosyntax. These results have **updated the analysis for each variable**: MAE auxiliary allomorphy selection is sensitive to animacy, and AAVE contraction/deletion and AAVE verbal -s also follow this pattern. With this evidence, I ar-

gue that MAE contraction and AAVE contraction are parallel, and that the lack of differentiation between AAVE contraction and deletion best supports Labov Contraction/Deletion rather than other possible underlying structures. Finally, I argue that verbal -s is part of AAVE grammar.

In addition to contributing to each variable's analysis, **the results also implicate a broader analysis for connections between these linguistic varieties.** While corpus results like those used here cannot conclusively speak to the relationship between MAE and AAVE, they can pinpoint new loci for further investigations.

I have argued that there are three possible explanations for animacy results in English, such that animacy effects could be:

- 1) **language-specific**
- 2) **entirely predictable from universal processing constraints**
- 3) **domain-general privileging reflected in language-specific structures**

In considering each possibility, I have argued that the third is the best option for the following reasons. Calling animacy effects language-specific is inadequate because it ignores the cross-linguistic importance of animacy, and fails to make connections and generalizations with other domains. Under this analysis, animacy would not be predicted to be privileged cognitively, or to be a consistent motivator of cross-linguistic language effects. Reducing the animacy effect to a universal processing constraint is also empirically unsatisfying. These case studies are not straightforwardly predictable without appealing to grammatical structures. Instead, I argue for animacy as a domain-general bias that individual grammars co-opt and reify. This approach acknowledges animacy's privileged status in human cognition, while also acknowledging that animacy effects cannot be fully explained without appealing to grammatical structures.

These animacy effects in English shed new light on old variables. From a sociolinguistic perspective, we see that initially unintuitive and unexplored factors like animacy

in English are robust predictors of variation. Furthermore, these results allow us to make progress on controversial aspects of grammatical analysis in AAVE, as well as refine our understanding of MAE morphosyntactic variation. These results may also be brought to bear in future discussions of the relationship between MAE and AAVE grammars. Finally, this dissertation contributes to the ongoing question in linguistic and psychological literature about the place of animacy in language, and how processing and grammar interact in linguistic conditioning. With animacy so significantly conditioning variation and having such profound theoretical implications, it is clear that future studies should give careful consideration to the role of animacy in language variation.

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