

The Perfect Approach to Adverbs
Applying variation theory to competing models

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Abstract

The question of adverbs and the meaning of the present perfect across varieties of English is central to sociolinguistic variationist methodologies that have approached the study of the present perfect (Winford, 1993; Tagliamonte, 1997; van Herk, 2008, 2010; Davydova, 2010; Tagliamonte, 2013). This dissertation attempts to disentangle the effect of adverbial support from the three canonical readings of the present perfect (Resultative, Experiential and Continuative). Canadian English, an understudied variety of English, is used to situate the results seen in the Early Modern English data. Early Modern English reflects the time period in which English has acquired the full modern use of the present perfect with the three readings.

In order to address both these questions and current controversies over statistical models in sociolinguistics, different statistical models are used: both the traditional Goldvarb X (Sankoff, Tagliamonte and Smith, 2005) and the newer mixed-effects logistic regression (Johnson, 2009). What is missing from the previous literature in sociolinguistics that advocates logistic mixed-effects models, and provided in this dissertation, is a clear statement of where they are inappropriate to use and their limitations.

The rate of adverbial marking of the present perfect in Canadian English falls between rates reported for US and British English in previous studies. The data show in both time periods that while adverbs are highly favored in continuative contexts, they are strongly disfavored in experiential and resultative contexts. In Early Modern English, adverbial support functions statistically differently for resultatives and experientials, but that difference collapses in the Canadian English sample. Both this and the other linguistic contexts support a different analysis for each set of data with respect to adverbial independence from the meaning of the present perfect form. Finally, when the focus of the analysis is on linguistic rather than social factors, both the traditional and newer models provide similar results. Where there are differences, however, these can be accounted for by the number of tokens and different estimation techniques for each model.

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Contents

Abstract	i
Acknowledgements	ii
List of Figures	vii
List of Tables	viii
1 Introduction	2
1.1 The Present Perfect and Adverbs	5
1.2 Canadian English and the Perfect	6
1.3 Statistics in Sociolinguistics	9
1.4 Dissertation Structure	10
2 The Present Perfect in English	11
2.1 Introduction	11
2.2 Linguistic Approaches to the Present Perfect in English	12
2.2.1 Resultatives	13
2.2.2 Experiential	16
2.2.3 Continuative	16
2.2.4 Other Systems	17
2.2.5 Theories of Present Perfect Meaning	18
2.3 Lexical Aspect and the Present Perfect	21
2.4 Quantitative Studies of the Present Perfect	25
2.4.1 Corpus Linguistic Studies of the Present Perfect	25
2.4.2 Variationist Studies of the Present Perfect	30
2.4.3 Competition of Past Temporal Reference Forms	35
2.5 Summary	37
3 The Historical Development of the Present Perfect	39
3.1 Introduction	39
3.2 The Development of the Present Perfect	40
3.2.1 Old English	41
3.2.2 Middle English	43
3.2.3 Early Modern English	45

3.2.4	Lifetime Constraints	46
3.2.5	The Present Perfect as Preterite in Earlier Englishes	49
3.2.6	BE Perfects	51
3.2.7	Summary	55
3.3	Grammaticalization of the Present Perfect	55
3.3.1	Cross-Dialectal Variation in English	59
3.4	Adverbs and the Present Perfect	63
3.5	Summary	66
4	Data and Method	67
4.1	Introduction	67
4.2	Data	67
4.2.1	Canadian English	68
4.2.2	Early Modern English Data	69
4.3	Adverbs with the Present Perfect	76
4.3.1	The Variable Context	77
4.3.2	The Broader Context of Past Temporal Reference	79
4.4	Linguistic Contexts that Influence the Appearance of Adverbs	80
4.4.1	Present Perfect Reading	81
4.4.2	Lexical Aspect	83
4.4.3	Negation	85
4.4.4	Clause Type	86
4.4.5	Grammatical Subject	87
4.4.6	Sentence Type	87
4.4.7	Voice	88
4.4.8	Overt Adverbial Modification and Meaning	88
4.5	Summary	89
5	Results and Discussion	90
5.1	Introduction	90
5.2	Distributional Results	92
5.2.1	Overall Frequency	92
5.2.2	Present Perfect Reading	93
5.2.3	Lexical Aspect	96
5.2.4	Negation	100
5.2.5	Clause Type	102
5.2.6	Grammatical Subject	105
5.2.7	Voice	108
5.2.8	Summary	109
5.3	Sociolinguistic Statistics	110
5.3.1	GOLDVARB X	111
5.3.2	Modern Canadian English	115
5.3.3	Early Modern English	118
5.4	Modern Logistic Regression	119
5.4.1	Background	119

5.4.2	Parameterization of Logistic Regression	121
5.4.3	Contrasts	124
5.4.4	From Goldvarb X to GLM	125
5.4.5	Logistic Regression with Random Effects	128
5.4.6	GLM and Random Effects in Sociolinguistics	132
5.4.7	Statistical Significance	136
5.4.8	GLM and Mixed-effects Results	138
5.5	The Perfect Approach to Adverbs	141
5.6	Which Statistical Model?	146
6	Conclusion	151
6.1	The Present Perfect and Adverbs	151
6.1.1	The Future of Adverbs and the Present Perfect.	152
6.2	Canadian English and the Perfect	154
6.3	Statistical Models	155
6.3.1	Furthering Statistics in Sociolinguistics	156
6.4	Summary	157
A	SAS Code	159
B	R code	164
	Bibliography	168

List of Figures

1	% of Adverb Support in Present Perfect	7
2	Adverb Modification by Reading	95
3	Adverb Modification by Negation	101
4	Adverb Modification by Clause Type	104
5	Adverb Modification by Grammatical Subject	107
6	Adverb Modification by Voice	109
7	Logistic Curve	111
8	Adverb Modification for Reading, Lexical Aspect and Clause Type	115
9	Adverb Modification for Person, Voice and Negation	116
10	Graph of Factor Weight Estimates in Canadian English data by Method	140

List of Tables

1	% of Adverbial Support for Present Perfect	8
2	Present Perfect Readings (adapted and expanded from Brinton (1988:11)	13
3	Vendlerian Lexical Aspect from Olsen (1997)	23
4	Corpus Studies of the Present Perfect	26
5	Corpus Linguistic Studies of the Present Perfect	28
6	Present Perfects with Adverbial Specification. Data from Elsness (1997:278-279) .	30
7	Variationist Studies of the Present Perfect	31
8	Data from Elsness (1997:294-295)	36
9	Data from McFadden & Alexiadou (2010:416)	54
10	The Present Perfect in Boethius Translations	65
11	Canadian English Distribution of Speakers	68
12	Data from 15th Century	74
13	Data from 16th Century	75
14	Data from 17th Century	76
15	Vendlerian Lexical Aspect from Olsen (1997)	84
16	Adverbial Modification in Canadian English.	92
17	Adverbial Modification in Early Modern English.	92
18	Rate of Adverbial Modification by Reading in Canadian English	93
19	Rate of Adverbial Modification by Reading in Early Modern English	94
20	Rate of Adverbial Modification by Lexical Aspect in Canadian English	97
21	Rate of Adverbial Modification by Lexical Aspect in Early Modern English	97
22	Vendlerian Lexical Aspect from Olsen (1997)	98
23	Rate of Adverbial Modification by Negation in Canadian English	100
24	Rate of Adverbial Modification by Negation in Early Modern English	101
25	Rate of Adverbial Modification by Clause Type in Canadian English	102
26	Rate of Adverbial Modification by Clause Type in Early Modern English	103
27	Rate of Adverbial Modification by Grammatical Subject in Canadian English . . .	105
28	Rate of Adverbial Modification by Grammatical Subject in Early Modern English .	106
29	Rate of Adverbial Modification by Voice in Canadian English	108
30	Rate of Adverbial Modification by Voice in Early Modern English	108
31	Multi-factor analysis of the linguistic factors contributing to the selection of overt adverbial modification with the present perfect in Canadian English.	116

32	Multi-factor analysis of the linguistic factors contributing to the selection of overt adverbial modification with the present perfect in Early Modern English	118
33	Differences between Goldvarb X and GLM-LR	126
34	Factor Weights from Goldvarb and GLM-LR in Early Modern English	138
35	Factor Weights from All Three Statistical Models in Canadian English	139
36	Post-Hoc Comparisons for Reading in Both Data Sets	141
37	Hypotheses	143
38	Distribution of Data by Speaker for Canadian English	148
39	Percent Adverbial Support for Present Perfect across Varieties of English	155

Chapter 1

Introduction

There are three contributions of this dissertation. The first contribution is a study of the present perfect in both modern Canadian English as in (1) and Early Modern English as in (2) and its relationship to the adverbs that modify it. Do the adverbs ¹ that modify the present perfect, as in (3)-(8), provide independent evidence of the meaning of the present perfect (separate from the form itself), a popular position among variationists (e.g. Tagliamonte, 1997, 2013; Schwenter and Torres Cacoullos, 2008; Davydova, 2011)², or do adverbs interact with the meaning already encoded by the present perfect form, a position taken by some syntacticians and semanticists (e.g. Alexiadou, 1997; Klein, 1994; Schaden, 2008; McFadden and Alexiadou, 2010)?

- (1) I **'ve gone** back and forth from either Oshawa or Whitby. (QEC/301/14)³
- (2) Your letter with ten shillings I **haue received** of Mr Simpson who **hath been** very kind to me hear;(CEEC/Fleming/311.126.2100)[Modern English Transliteration: Your letter with ten shillings I have received of Mr Simpson who hath been very kind to me here.]⁴

¹Some scholars distinguish lexical adverbs from clausal adverbials. I use the term *adverbs* to encompass both.

²If one assumes a compositional approach to meaning, then this position is represented by theories that treat the present perfect as underspecified (e.g. Nishiyama and Koenig, 2010)

³Tokens extracted from the Quebec English Corpus (Poplack, Walker and Malcomson, 2006) are housed at the Sociolinguistics Laboratory at the University of Ottawa. Codes in parentheses represent speaker number and line number of the utterance in the Quebec English Corpus. Examples are reproduced verbatim from speaker utterances.

⁴Early Modern English tokens presented here are from the Corpus of Early English Correspondence (Taylor et al., 2006) and represented with the series of letters and line number. Examples are unmodified from the corpus and followed by a transcription into Modern English (ModEng) orthography.

An example that illustrates the difference between the two approaches is in the works of Davydova (2011) and Michaelis (1994;1996) and the treatment of the adverb *already*. Davydova (2011:126) takes the adverb to reinforce the 'resultativeness' of an already resultative present perfect context. Michaelis (1996:479), on the other hand, argues that *already* generates its own 'already state' that interacts with different verbal forms (preterite, present perfect, past perfect) rather than reinforces resultativeness. Similar examples can be found for other adverbs that co-occur with the present perfect and are used by some variationists to identify present perfect contexts. The meaning of the present perfect and the contribution of adverbs is elaborated in chapter 2.

- (3) I know Andrew's **complained** many a time for things he **hasn't done**.(QEC/309/192)
- (4) Oh, we **haven't been together** eight years. (QEC/308/1311)
- (5) We've **travelled** to England different times. (QEC/311/546)
- (6) I am now at Redgraue- wher I **haue bin** ij nights **excepted** euer since my retourne- & wher I begin to grow very restless; [ModEng: I am now at Redgrave, where I **have been expected** for two nights ever since my return & where I begin to grow very restless].(PCEEC/CORNWAL/84.056.740)
- (7) He **hath not be rewardyd** as yet but by Richard Call- as he canne tell you. [ModEng: He **has not been rewarded** as yet but by Richard Call as he can tell you.] (PCEEC/PAS-TON/307.102.3066)
- (8) My fellow watchers **have bin** a sleep too till just now. [ModEng: My fellow watchers **have been** asleep too till just now.](PCEEC/OSBORNE/37.017.777)

The answer to the question of the relationship between the present perfect and adverbs has the potential to extend our knowledge of linguistic variation in general and tense and aspect in English in particular. First, a quantitative study of this relationship can shed light on the contentious issue of what other past temporal reference forms to include when examining the domain of present

perfect meaning in different varieties of English (Tagliamonte, 1997; van Herk, 2008, 2010; Davydova, 2011). Second, the delimitation of the variable context, presented fully in Chapter 4, to the presence or absence of adverbs is an understudied area in variationist sociolinguistics. Third, a quantitative study of the relationship between the present perfect form and adverb modification from the period of Early Modern English to Modern Canadian English entails a perspective on the development of the present perfect that has not been applied before.

The second contribution is the new information furnished by this thesis on the present perfect in Canadian English, extending the conventional focus on the present perfect in British and American English to another major national variety that has been less extensively researched (Clarke 1993: vii; Brinton and Fee 2001: 424). Finally, the third contribution is a critical assessment of various statistical models proposed recently in variationist sociolinguistics. Several recent studies, such as Johnson (2009) and Drager & Hay (2012), have questioned the appropriateness of statistical models such as the Goldvarb program developed by Cedergren and Sankoff (1974), recommending that these be replaced by models based on mixed effects logistic regression with speakers as a random effect. The advocates of these newer statistical models, however, focus on the differences these analyses provide for extra-linguistic (i.e. social) effects. What has not been clearly established in the literature that advocates mixed-effect logistic regression models is whether such techniques offer distinct advantages over alternatives such as Goldvarb when assessing linguistic (as opposed to social) effects on morphosyntactic variation. Further, missing from much of the recent literature is a clear statement of not only the technical assumptions of these competing models, but the effects these assumptions have on the analyst's interpretation of the data. The study of the co-occurrence of the present perfect with adverbs offers an important opportunity to evaluate these models and especially their utility in evaluating the linguistic conditioning of variability as opposed to the social constraints that have figured so prominently in recent critiques of conventional analytical techniques such as Goldvarb.

1.1 The Present Perfect and Adverbs

Whether the present perfect form (HAVE + Perfect Participle)⁵, in (1) and (2), has a core meaning separate from the surrounding adverbial context is currently debated in linguistics (Klein, 1992; Nishiyama & Koenig, 2010; Yao & Collins, 2013). Through the use of a variationist framework, this dissertation develops a methodology to test whether or not the present perfect form itself has a core meaning as some linguists claim (Winford, 1993; Tagliamonte, 1997, 2013; Davydova, 2011) or if it is what grammarians and some variationists would call a ‘semantically underspecified’ form that derives its meaning from the surrounding context (mainly adverbs) (Nishiyama & Koenig, 2010:611-612; van Herk, 2010; van Rooy, 2009). In some linguistic studies, adverbial marking is taken to be an independent assessment of semantic (and more specifically, aspectual) meaning of different verb forms (e.g. Tagliamonte, 1997,2013 cf. Tagliamonte, 1998). From a variationist perspective, the present perfect form in English has proven controversial as there is no consensus on what forms constitute the other part of the variable context, those non-present perfect forms which may have a present perfect meaning (van Herk, 2008).

If the present perfect form itself encodes a broad present perfect meaning without requiring adverbial or contextual support to do so, then adverbs that modify the present perfect are not independent evidence of a present perfect meaning in non-present perfect forms (e.g. most semantic accounts of the perfect-Klein, 1994; Portner, 2003, Schaden, 2008). On the other hand, if there are a set of adverbial or contextual cues that present perfect meaning, then we could rely on those cues to provide a variable context (e.g. Tagliamonte, 1997:344-345; Davydova, 2011:67-70). Moreover, present perfect meaning constitutes a broad array of functions, presented in chapter 2 – each of which may or may not prove to be reinforced with independent adverbial marking. In order to test these competing theories, I draw on the infrastructure of variationist sociolinguistics, supplemented by insights from the theoretical syntactic and semantic literature. Synchronic data from modern Canadian English, as in (1), supplemented with diachronic data, as in (2), from Early

⁵The alternative auxiliary for the present perfect construction in some varieties of English, BE, is discussed in Chapter 3

Modern English are examined with a view to providing a more detailed picture of the relationship between the present perfect and overt adverbial specification.

The present perfect form can surface with and without adverbial specification. We fully elaborate the variable context in Chapter 4, but provide some initial discussion here. In (9)-(14) below, the present perfect itself is bold and the adverbial support underlined. There are two variants: those present perfect forms that occur without adverbs as in (9)-(11) and those that occur with adverbials as in (12)-(14).

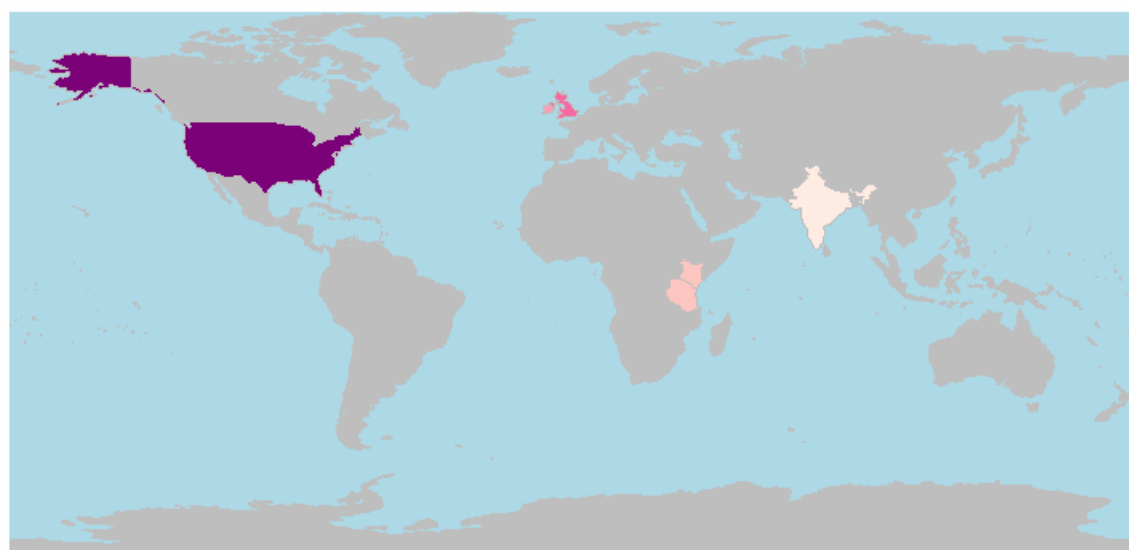
- (9) Jennifer's in-laws have a cottage in Haliburton, we **'ve cottaged** there with them.(QEC/311/1125)
- (10) Oh I 'm done- I **'ve done** all the concept paper.(QEC/315/648)
- (11) We have been on- we **have crossed** the Channel with Missy's parents. (QEC/311/1187)
- (12) I**'ve been** out to the bars once there.(QEC/304/601)
- (13) I **have spoken** it since I was grade-one, so, it was six years I **'ve been** speaking French.(QEC/301/2094)
- (14) Should I see the doctor and tell him or not, I **'ve already booked** with the thing.(QEC/306/1466)
- (15) I don't think I **'ve ever taught** a saxophone lesson. (QEC/308/198)

The presence or absence of adverbial support meets the traditional definition of a linguistic variable (Labov, 1972), where not only the tokens which include an adverb are included, but the tokens of present perfect forms where an adverb could occur but does not are also included. There is considerable variability in where adverbs could occur that has not been accounted for in previous variationist studies and this lacuna is addressed in the present work.

1.2 Canadian English and the Perfect

Many descriptive accounts of the status of the present perfect in current English (as well as corpus linguistic studies) focus on a British-US dichotomy (e.g. Foster, 1968: 210; Schlüter, 2006;

Figure 1: % of Adverb Support in Present Perfect



Overall % Adverb Specification of Present Perfect

- 15
- 23
- 25
- 26
- 31
- 33

Variety of English	Total Number of Present Perfects	% with Adverbial Marking
Indian English	182	15
East African English	247	23
Irish English	1283	25
British English	1812	26
Singaporean English	532	31
US English (Hundt and Smith, 2008)	1376	33

Table 1: % of Adverbial Support for Present Perfect

Elsness, 2009; Hundt and Smith, 2009). We see in Figure 1 a map of data adapted from Davydova (2011) across data from the International Corpus of English with the US data from Hundt & Smith's (2009) study of the BROWN and FROWN corpora.⁶ The relationship between the present perfect and adverbial specification has been studied in many varieties of English, with the lowest rate reported for Indian English and the highest reported for US English in Table 1. These rates indicate a robust amount of variation that has not been accounted for from a variationist perspective (or in Canadian English).

One benefit of a variationist analysis over standard corpus linguistic approaches is that we can uncover not only the overall rate of adverb modification but also underlying conditions that motivate the adverbial modification (Poplack and Tagliamonte, 2001:85-92). Our data, as described in Chapter 4, would provide at least one point for synchronic comparison with the results reported for other modern varieties while our component of the Early Modern English corpus would allow us to provide some diachronic depth to the reported rates for other varieties. Moreover, by documenting the relationship between contemporary and diachronic varieties of English for the present perfect, I can elucidate the evolutionary mechanisms that give rise to the contemporary relationship between the present perfect and adverbial specification (see Milroy and Gordon, 2003: 176-179).

⁶This map was produced using the `rworldmap` procedure in R based on the rates reported for differing varieties of English.

1.3 Statistics in Sociolinguistics

Variationist approaches to (socio-)linguistics habitually make use of multiple regression⁷ to assess the statistical significance and relative magnitude of the respective extralinguistic and linguistic constraints on variant choice. Saito (1999) originally critiqued the use of Goldvarb⁸ in the field of second language acquisition and, more recently, Johnson (2009) has revived some of the same arguments. Their main argument is that by failing to account for the statistical repercussions of multiple tokens from individual speakers, the models sociolinguists use may produce incorrect and misleading results. A response to Saito was provided by Young and Yandell (1999) and was not based on the underlying statistical models, but argued instead against solely data-driven models that ignore important theoretical questions and assumptions. This dissertation's findings supports Young and Yandell's main conclusion, but buttresses the argument with an examination of the underlying technical assumptions and results for both the model generated by Goldvarb and the newer proposed models. This controversy has informed many conference talks, workshops and recent publications (e.g. Campbell-Kibler, 2009; Drager & Hay, 2012; Paolillo, 2013). Detailed consideration of the utility of competing models for assessing the impact of linguistic (rather than social) factors on variant choice reveals that Goldvarb can yield more accurate results than alternative models. This finding calls into question recent claims that Goldvarb should be abandoned in favour of competing methods of statistical analysis. Chapter 5 presents a detailed discussion of these issues, exemplifying with the present perfect and adverbial modification.

⁷I use the term 'multiple' where some variationists would use multivariate. Multivariate in most modern statistical literature is broadly used to discuss data where there are multiple *dependent* variables, not just independent factors. In fact the standard regression approach is applied for multiple independent variables, as there are more powerful alternatives when there is just one independent variable

⁸Goldvarb is the current incarnation of the Varbrul family of programs initially developed in the 1970's and elaborated on in Chapter 4 where the underlying statistical models are discussed

1.4 Dissertation Structure

A review of the literature on the present perfect in chapter 2 is presented. Chapter 2 includes not only a description of the major readings of the present perfect, but also touches on broader theoretical accounts as well. Corpus linguistic and sociolinguistic studies of the present perfect are presented and discussed in this chapter as well. Chapter 2 transitions from a synchronic to a diachronic discussion of the present perfect in chapter 3. In this chapter the development of the present perfect is discussed for English. Chapter 3 also offers a synopsis of the grammaticalization of the present perfect in varieties of English, and explores similar pathways of change in other languages. Chapter 4 presents the data, its motivations and the methodologies applied in this thesis. Formal hypotheses regarding the nature of adverbs and the present perfect are presented and operationalized in detail. The application of the methodology to our data provides the results discussed in chapter 5. Further, chapter 5 includes a review of the statistical methods tested in this work near the results for each model. The distributional and statistical results for each of our data sets are analysed. The final chapter of this dissertation summarizes the major findings and proposes future directions for each of the main contributions of this work.

Chapter 2

The Present Perfect in English

2.1 Introduction

The present perfect in English has been studied from a number of different methodological and theoretical perspectives (e.g. McCawley, 1971; McCoard, 1978; Fenn, 1986; Elsness, 1997; Schlüter, 2000; Portner, 2003; Pancheva, 2003). This chapter provides a foundation for the methodology in chapter 4 and an overview of scholarly work on the present perfect that is relevant to my research objectives. Sections 2.2-2.3 present the standard overview of the present perfect in English from a descriptive perspective informed by modern semantic contributions to the study of the present perfect. Section 2.3 provides the background for lexical aspect used in this work. Section 2.4 is an overview of both broad corpus linguistic studies and variationist studies of the present perfect across different varieties of English. Concerns with the methodological approach adopted in earlier studies of the present perfect are also discussed. The primary focus of 2.4 is a critical evaluation of how both corpus and variationist studies delimit the forms or functions that comprise the present perfect. This chapter mostly focuses on a discussion of the present perfect in contemporary varieties of English. A diachronic perspective on the historical development of the present perfect is given in Chapter 3.

2.2 Linguistic Approaches to the Present Perfect in English

There are a number of taxonomies associated with the present perfect meaning in Modern English. For this section, I present the terminology followed in this work and explicate the tripartite taxonomy of meaning I use (also found in other variationist studies of the perfect (Winford, 1993; Tagliamonte, 1997, 2013; Davydova, 2011)). For the present perfect form in modern English, there are three kinds of readings: RESULTATIVE, EXPERIENTIAL and CONTINUATIVE (see Table 2). I define each of these three main readings and provide relevant examples. The fourth type of reading that may appear in studies of the present perfect, the *hot news perfect*, is considered here a kind of resultative and is discussed at the end of section 2.2.1. A number of semantic analyses of the present perfect do not attempt a classification of the various readings or meanings that HAVE+Past Participle can encode. For example, McCoard (1978) discusses unifying theories of the present perfect and avoids labelling the various uses of the perfect. In a similar manner, Hataav (1993: 218-220) only analyses the present perfect as the combination of the present tense with the perfect aspect rather than categorizing types of perfect meaning. Modern semanticians also take a broader view of how the various readings associated with the present perfect arise from a core meaning of the present perfect that can be flavored with surrounding context to produce one of these three readings. Yet, here I focus on the three main readings that have informed variationist studies of the present perfect function (Winford, 1993; Tagliamonte, 1997, 2013; Davydova, 2011).

Brinton (1988: 11) presents a summary of the different readings and labels of the present perfect in English, which are adapted and expanded in Table 2 with the first column consisting of the terminology used here. While many names appear for the different readings, the lexical terms reflect notational variance.

RESULTATIVE PERFECT	Permansive present or retrospective variety of the present (Jespersen, 1924:269) Resultative perfect (Kruisinga, 1931:390; Bauer, 1970:189; Portner, 2003; Nishiyama & Koenig, 2010; van Rooy, 2012) Resultative past (Leech, 1971: 34-35) Stative perfect (McCawley, 1971: 104)
CONTINUATIVE PERFECT	Inclusive past-and-present (Jespersen, 1924:271) Continuative perfect (Kruisinga, 1931: 391; Bauer, 1970:189; Winford, 1993; Tagliamonte, 1997, 2013; Portner, 2003; Nishiyama & Koenig, 2010; van Rooy, 2012) State-up-to-the-present and habit-in-a-period-leading-up-to-the-present (Leech, 1971:31-34) Universal perfect(McCawley, 1971:104) The Extended-Now Perfect (McCafferty, 2005; Davydova, 2011)
EXPERIENTIAL PERFECT	Perfect of Experience (Zandvoort, 1932; Brinton, 1988) Indefinite past(Leech, 1971:32-33) Existential Perfect (McCawley, 1971:104) Experiential Perfect (Comrie, 1976:58-59; Winford, 1993; Tagliamonte, 1997, 2013; Portner, 2003; Nishiyama & Koenig, 2010; Davydova, 2011) Iterative Perfect (van Rooy, 2012)
RESULTATIVE (HOT NEWS)	Recent indefinite past (Leech, 1971: 33) Hot News Perfect (McCawley, 1971: 104; Schwenter, 1994; Portner, 2003; Nishiyama & Koenig, 2010) Perfect of Recent Past (Comrie, 1976:60-61; Brinton, 1988; Winford, 1993; van Rooy, 2009; Davydova, 2011)

Table 2: Present Perfect Readings (adapted and expanded from Brinton (1988:11)

2.2.1 Resultatives

- (1) And it 's like, "Oh, yeah, I know them." Or, I 've at least **heard** the name. (QEC/301/256)
- (2) They've **built** two more since I've left. (QEC/301/617)
- (3) Now that I 've **been** to Durham, I 've got frien– and I've made other friends in Whitby that are older.(QEC/315/285)

The first reading available to the present perfect form is the resultative one. Comrie (1976: 56) defines the resultative use of the perfect (in his terms, *the perfect of result*) as when "a present state is referred to as being the result of some past situation." The implications of this according

to Comrie is that the results of an action still hold. Thus, for (2), for example, the implication is that the event of leaving is still true at present time. The speaker has not returned. This reading is made available by the since-clause adjoined to the “they’ve built two more”. Bybee, Perkins and Pagliuca (1994:81-87) present resultatives as the first step in a past temporal reference form’s path toward perfectiveness. According to these authors, the English present perfect is on the “anterior” part of the path where it has acquired an indefinite past meaning tied to speech time (e.g. something happened before *now* that is important *now*). McFadden and Alexiadou (2010: 392) find quantitative evidence in their corpora of Old English, Middle English and Early Modern English indicating that “resultative constructions grammaticalized to become perfect-constructions with anterior temporal-aspectual meanings are not restricted to resultativity” (i.e. the experiential and continuative reading, discussed below). This path of development is explored more fully in Chapter 3. Finally, when we examine the acquisition of the present perfect functions in L1 English, the resultative is the first use of the present perfect children acquire (Gathercole, 1986; Slobin, 1994). Resultative constructions are often the prototype for what develops into a subsequent present perfect cross-linguistically (McFadden and Alexiadou, 2010; Ritz, 2012:884). Thus, if the present perfect form encodes this meaning, we would expect the present perfect form itself to occur less frequently with adverbs that encode this meaning (and that other past temporal reference forms would have to occur with these adverbs in order to encode a resultative meaning). In (4) and (5) we see examples of such use with preterites.

- (4) I just- I have fun with them, and y– I-mean, we **talked already** about the inappropriateness.
(QEC/313/1158)
- (5) I **said** party probably about twenty times **already** on this.(QEC/315/547)

Mittwoch (2008) discusses how the resultative meaning is what she terms a *conventional implicature* and allows for both the present perfect form and the preterite to obtain in contexts as above: where the result state of the event (*talked* and *said*, respectively) holds at speech time. The only way the analyst can arrive at perfect reading for (4) and (5) is via the adverb *already*, which is

contained in both. We return to this alternation later in this chapter.

There are a number of other readings mentioned in the literature that seem to be beyond merely a resultative. For example, Comrie (1976: 60) adds the “perfect of recent past” as an expansion of the resultative reading that includes the result state of events that just happened to a speaker. There has been a discussion in the literature about whether what are termed ‘hot news’ perfects (encoding a type of recency) are really another type of perfect. McCoard (1978) and McCawley (1981) see the hot news/recent reading of the perfect as a sub-category of the experiential perfect. Kiparsky (2002) argues that the events described by experiential perfects may repeat and that cross-linguistically, there are languages in which experiential perfects cannot have recent readings. Kiparsky, building on a statement from Michaelis (1994:127 fn 4), considers the recency reading to be a sub-part of the resultative reading of the present perfect. He finds cross-linguistic evidence of this in that a number of resultative forms also can yield a recency reading and he cites the Vedic Sanskrit Aorist as an example (Kiparsky, 1998). Michaelis (1998: 158) continues the analysis of ‘hot-news’ as a resultative reading by demonstrating that both present new information into the discourse - a change of state, broadly defined. There is also a component to both the hot-news and resultative future that hints at the possibility of future actions based on the event. Her example, in (6), is that the speaker might utter this as a response when they notice the web during a picnic outside, but that (6) is ungrammatical as a response to the question “Why are your glasses over there?”. The resultative or hot news reading implies that future action in response to the event is still possible, but in English only the preterite can be used when a response to the event has taken place. For example, if the speaker has cleaned the glasses and set the glasses by the wall, then (6) would be ungrammatical, under Michaelis’ analysis¹.

¹From a variationist perspective, recency could be considered a conditioning factor, rather than an independent reading of the present perfect. Claims of this reading are never really explicated with a definition of recency: how recent is recent? (Comrie (ibid: 60) defines the recent past as “the past situation is very recent.”—see Torres Cacoullos & Walker (2009) for a similar discussion around proximity in the future). In the examination of recency, we have arrived at a subset of the larger question in this dissertation: does specification with a temporal adverbial indicating recency (eg. *three hours ago*, *just now*, etc.) reinforce a meaning that is already inherent in the present perfect itself, or does it create this meaning? This claim, however, can be operationalized as a constraint on the occurrence of the adverb with the present perfect as discussed in chapter 4.

- (6) A spider has built a web on my glasses.

2.2.2 Experiential

The second category of meaning for the present perfect is the experiential one. Comrie (1976: 58) defines the experiential perfect as marking “a given situation that has held at least once during the time in the past leading up to the present.” Mittwoch (2008:324) defines the experiential perfect in a more precise manner: “There is at least one event of the type denoted by the base sentence in the interval terminating at evaluation time.” Gathercole (1986) finds that children acquire this use after the resultative perfect, but before the continuative perfect.

- (7) Uhm, and the farthest I’ve been in the States is, I went to Washington on a school trip.
(QEC/301/1095)
- (8) They never really trusted me with parties after that. But they’ve let me had like a couple like small parties (QEC/305/798)

Both (7) and (8) have an experiential reading. How is (7) experiential and not resultative? First, the result state (being in the States) is no longer true. The speaker is (at the moment of utterance) in Canada not the States. While experiential perfects may indicate eventualities that are currently relevant, they do not hold at the moment of utterance. A resultative result state holds at the moment of utterance. In Example (2)(from section 2.2.1), a resultative reading is that the friends are friends at the moment of utterance. While an experiential reading would preclude the “other friends” from still being friends with the speaker and, in the absence of contradictory evidence, the implication that speaker and “other friends” are still friends is presumed true.

2.2.3 Continuative

The continuative (or universal reading) of the present perfect is one of the three main readings, as shown later, to occur mostly with adverbs. Comrie (1976:60) terms this reading as the “perfect

of persistence” and defines it as a state or event begun in the past that continues through speech time, seen in (9). Although Bauer (1970) and Crystal (1966) claim that it is impossible to obtain a continuative reading without adverbial support, Schlüter (2001) finds that while continuatives have almost double the adverbial specification of other present perfect readings with 66% of continuatives in his data (of US and British English) occurring with adverbial specification, there is variability in adverb marking as in (10).

(9) for the last forty years I **'ve been** in the insurance business. (QEC/310/614)

(10) We took the train, probably there would be the best holiday we **'ve had**. We took the Canadiana across Canada from Toronto to Vancouver.(QEC/311/1240)

2.2.4 Other Systems

There are several other systems that present versions of the three readings discussed above (with and without recency as a separate reading). Table 2 categorizes the three readings of perfect (plus recency) with different names across the literature (expanded from Brinton, 1988:11). Declerck (1991) divides the readings of the present perfect into two categories: Indefinite Past and Continuatives. The indefinite past subsumes any present perfect that references a temporally unspecified past event. Continuatives take the same meaning as discussed above. Binnick (1991:99) separates the present perfects into two broad readings: Existentials and Statives. Existentials are those present perfects in which the result state no longer holds while statives are those which do. These accounts do not generally form the basis of approaches to the present perfect in variationist sociolinguistics, corpus linguistics and first language acquisition. In this study, the division between resultative, experiential and continuative readings of the present perfect are retained in order to facilitate systematic comparison with the results of other studies

2.2.5 Theories of Present Perfect Meaning

The main unifying feature of the present perfect, repeated again and again in the literature, is current relevance. Bybee, Perkins, and Paliguca (1994:61) find that “the definition generally agreed upon for anterior (Present Perfect) is a ‘past action with current relevance.’ ” Yet an abiding problem with the notion of current relevance involves reliably and systematically distinguishing the past with current relevance from the past with non-current relevance (Brinton, 1988: 12; Klein, 1993; Depraetere, 1998). For variationist sociolinguists it is important to delineate, as much as possible, where this current relevance can be found and with it the array of forms that can mark current relevance. Current relevance(CR) is the *sine qua non* of perfect meaning, but while it is easy to assert that the present perfect denotes a past action with current relevance, it is considerably more difficult to demonstrate objectively that this is the case every time the present perfect is used. In each of the above mentioned cases, however, we can see that adverbial modification features prominently in the adduction of a CR meaning.

While current relevance is often mentioned as a meaning for the present perfect (e.g. Michaelis, 1994) , it does not, currently, seem to form the fundamental meaning of the present perfect in any published semantic framework that could be located within the last 10 years. Proponents of the INDEFINITE PAST and EXTENDED NOW theories, two theories elaborated on at the end of this section, mention current relevance as a by-product of their preferred fundamental meaning. Finally, current relevance has been criticized as unreliable as a categorical concept, but if the underlying function of the present perfect is to denote some kind of CURRENT RELEVANCE then we would expect linguistic contexts which access some function of this meaning (i.e. serve to mark relevant facts) to predict the preference of the present perfect.

Scholars have previously noted that the concept of CURRENT RELEVANCE lacks clarity(e.g. Brinton (1988: 12), Lakoff (1970: 844), Palmer (1974: 52), Vermant (1983: 20-22), Klein (1992) and Depraetere (1998)). There is a general sense that in discourse, all predicates are somehow relevant, but there is an immediate relevancy implied by *current relevance*. Klein (1992: 531) criticizes this label and states ‘it is always possible to find a reason why the event is still of particular

relevance to the present’ and that such a criterion eludes falsifiability. Brinton (1988:12) begins by criticizing the notion of current relevance, but concludes (ibid:14) that “despite the fuzziness or vagueness of the notion of ‘current relevance’, it probably has to be retained. Whereas the perfective views a situation as discrete, the perfect views it as somehow *connected* to the present state.” While there is not a clear consensus in the literature on how the general present perfect meaning in English generates each possible reading, several variationist studies use *current relevance* as a label to unify all of the three readings (e.g. Schwenter and Torres Caoulló, 2010:19; Davydova, 2011:4).

There are two other major semantic theories of the present perfect. One theory treats the present perfect as an *indefinite past* (Reichenbach, 1947; Klein 1992,1994) and claims the present perfect has an undefined past meaning that extends the time interval of an event through to the moment of speech. The other theory of the present perfect, the *extended now* theory (Dowty, 1979; 1986; Mittwoch, 1988; Stechow 1999; Pancheva and Stechow, 2004), indicates that the present perfect functions as a marker of the “extended now” or, more precisely, the extended moment of speech time. More recently, Nishiyama & Koenig (2010) have suggested that the present perfect in English is largely lacking in semantic specification and that meaning for each perfect perfect comes not from the semantic form itself, but the contextual information. Specifically, Nishiyama & Koenig (ibid: 640) state that present perfect in English “is underspecified semantically.” where the contextual cues and pragmatic environment “lead hearers to appropriately fill in the value of that variable.” While these theories have not informed variationist approaches, I do incorporate results and claims from studies that use these theories later in this chapter and the next chapter.

Some recent semantic work has focused on where the present perfect and preterite can overlap in meaning. More specifically, these studies discuss where the preterite can have an overlap in meaning with the present perfect. Studies that discuss the overlap where the present perfect acquires preterite use are presented in Chapter 3. Both Mittwoch (2008) and Schaden (2009) argue that the present perfect “competes” with the preterite in simple past in specific contexts. Mittwoch’s (2008) analysis focuses on the ambiguity between the Experiential meaning of the present perfect

and the Resultative meaning. In (11), (reproduced from *ibid*: 325), the present perfect's ambiguity between the experiential or resultative meanings derives from Ann's first sentence and subsequent clarification in her second. The resultative reading of "I have lost my passport" includes the speech time in the event time (thus, the passport is still lost).

The Experiential reading locates the event time wholly in the past (comparable with "At one time in the past, I lost my passport.")

(11) Ann: I have lost my passport.

Beth: Oh dear. What are you going to do?

Ann: Oh no, I meant in the past.

Schaden's analysis is a response to a contemporary research interest in modern semantics: The Present Perfect puzzle. The crux of Portner's (2003) puzzle is the cross-linguistic semantic distribution of the present perfect. According to Portner (based on prior semantic analysis) some languages did not allow the present perfect (HAVE or BE in combination with a participle) to combine with a localizing temporal expression, an adverb or adverbial phrase that pinpoints the predicate's event. English and Spanish are said to follow this pattern. Schwenter and Torres Cacoullos (2008), however, convincingly demonstrate that not only do some varieties of Spanish not follow this restriction, the default (or unmarked) past tense form in varieties do differ. Schaden's (2009:139) claims that present perfects "become more and more past-like" and should shift toward the default marker of past tense.

Schaden (2009) proffers "*I think that nobody would deny that there are at least some contexts in which one can chose more or less freely between a simple past tense and a present perfect tense. Yet, in other contexts, one has to chose one form rather than the other.*" What has not been clearly established, however, is where in speech the present perfect form itself can occur and where we can detect overlapping meaning with the preterite. A first step towards doing this is to fully describe where the present perfect form does occur and how adverbial specification contributes to

the readings of the present perfect.

Underspecification

Many of the theoretical accounts discussed in section 2.2.5 presuppose a fully specified meaning of the present perfect. Nishiyama and Koenig (2010) propose that the present perfect introduces an under-specified operator into the discourse (ibid:614) that references a state of an event. The recognized meanings of the perfect are created by the co-occurring elements in the ambient discourse (adverbs, plurals, topic, etc.). These discourse elements fill in the gap between this underspecified state introduced by the present perfect and the present perfect readings discussed in Section 2.2.1 - 2.2.4. This would be one possible theoretical account of how a reading of the present perfect could be created with adverbial support.

Even if one does not assume the under-specification of the present perfect, there are still accounts, cross-linguistically, where different elements of the discourse interact with the present perfect and change the use of the present perfect. In Portuguese, for example, Amaral and Howe (2013) claim that the present perfect form has a default iterative reading that they explain as a transfer of nominal plurality onto the present perfect as verbal plurality (i.e. iterative reading). This work focuses on the contribution of adverbs to the meaning in sentences with a present perfect, but the underlying semantic specification of the present perfect is not available in corpus data (discussed further in Section 2.4 and Chapter 4).

2.3 Lexical Aspect and the Present Perfect

Any study of the present perfect (and aspect in general) has to acknowledge the division between lexical and grammatical aspect. Many of the early descriptivists notice that there is a substantive difference between aspect morphologically marked in some manner and a kind of aspect that is incorporated into the lexical verb itself. This section first contains a discussion of the definition of lexical and grammatical aspect used in this work. There is a vast literature on lexical aspect (e.g.

Verkuyl, 1993; Smith, 1997; Rothstein, 2008, *inter alia*)), but for concreteness and convenience, I adopt the terminology (and ultimately the system) proposed by Olsen (1997) for use in this dissertation.

I use the term *lexical aspect* to mean the component of “internal temporal constituency” (Olsen, 1997:8) contributed by the lexical verb itself versus *grammatical aspect* which is the overt morphology that combine with the lexical verb to create temporal meaning² Lexical aspect contains the argument of *v* in syntactic terms and includes the grammatical object, subject and prepositional adjuncts. Grammatical aspect, in English, includes the affect of progressive versus perfect versus simple morphology on an utterance.

Vendler (1967) proposes the familiar taxonomy of (English) lexical verbs that is often employed in the discussion of the present perfect: States, Activities, Achievements, Accomplishments. States are those predicates that involve no dynamic movement on the part of the grammatical subject but simply describe a state, as in (12). Activities describe events that involve no inherent end point as in (13). Accomplishments denote activities that have a natural culmination (or end) as in (14). Achievements denote a punctual event that has an near-instantaneous inherent culmination as in (15). Although there are a number of tests that distinguish between these categories (e.g. Dowty, 1979 and the *imperfective paradox*), we discuss in this section a system of privative features that enables our data to be readily classified into these traditional groupings.

- (12) Charles knows John. I live in Houston.
- (13) Sally walks in the park. Martha screams at her children.
- (14) Julia builds houses. Mark reads the book.
- (15) Jim lost the race. Sam found the house.

Olsen (1997) proposes that Vendler’s classes be decomposed into three privative features: telicity, dynamicity and durativity. The privative component of these features is due to each feature’s

²Lexical aspect has several other names that reference the same idea: situation aspect, Aktionsart, verb class, etc.

presence being an entailment (i.e. unable to be overridden via context or pragmatics) whereas the absence of each feature is an implicature which can be overridden. The presence of each feature is indicated with a '+' in Table 3 along with the Vendlerian class to which each feature maps. Olsen's system is based on a number of features that combine into the traditional Vendlerian classes—so that any hypotheses that are framed in terms of the Vendler's traditional classes can be deconstructed and can be used to translate claims made about the present perfect and lexical aspect in Olsen's system.

Class	Telic	Dynamic	Durative
States			+
Activities		+	+
Accomplishments	+	+	+
Achievements	+	+	
Semelfactives		+	
Stage-level state			+

Table 3: Vendlerian Lexical Aspect from Olsen (1997)

Telicity under Olsen's analysis includes lexical verbs that entail an end state or result without, for English, considering tense (and grammatical aspect). Thus, (17) has [+Telic] feature while the sentences in (16) and (18) do not. Durative situations are those "that take an interval of time". This separates states, activities and accomplishments from achievements. While some have noted that achievements can still coerce a durative meaning (Dowty, 1988 and Smith, 1991:31) the reverse is not true: states, activities and accomplishments cannot coerce a punctual meaning and thus, durativity is privative. For example, *John lost the wrestling match* has a punctual reading, but we can modify this with *in an hour* and obtain a durative reading. Punctuality, however, cannot be similarly coerced from durative verbs. The dynamic feature is what separates states from the other three classes and is indicated by an event of change. We have [+dynamic] predicates in (16) - (19) and a stative in (20).

(16) I run.

(17) I ran to the store to get milk.

(18) I run races.

(19) I lost the race.

(20) I love races.

This ontology of lexical aspect, like that presented in Tenny (1994), Verkuyl (1993), Smith (1991) *inter alia*, comprises the bare verb and concomitant arguments and distinguishes adjuncts and arguments for the verb. Thus, the sentences in (21)-(23) all have the same lexical aspect. The bare verb, *run*, is itself an activity or [+Dynamic,+Durative] under Olsen's analysis. The argument, *down the road*, however, adds another component to the lexical aspect, [+Telic], and makes the predicate an accomplishment, rather than simply an activity. Semelfactives represent a category not discussed in Vendler's original conception of lexical aspect and include verbs such as *knock*, *cough* that are instantaneous and punctual. Stage-level states (Olsen, 1997:48-49; Dowty, 1979:129) differ from states in that telicity in some languages is a feature inherent in their meaning and are made necessary by events that have to end (e.g. *John is in the house*). These are often copula sentences (e.g. *be drunk/alive/available/here*) that include an end state. For English, however, telicity is unmarked for Stage-Level States.

(21) The dog runs down the road.

(22) The dog is running down the road.

(23) The dog has ran down the road.

Lexical aspect interacts with the present perfect in that certain readings become unavailable to different lexical classes or become ambiguous between two or more readings for others. Olsen (1997:176) states that [+dynamic] verbs produce an existential reading, but those without this feature (i.e. achievements) are ambiguous between existential and universal readings. Those without the [+Telic] feature can be continuative or resultative. The [+Durative] feature is not thought to distinguish possible readings. These claims have a direct bearing in the broader research ques-

tion addressing the nature of the relationship between the present perfect and adverbs. If adverbs serve to reinforce present perfect meaning, we could expect that the different classes which are ambivalent between two readings to require (or as we discuss in chapter 4, favor) the appearance of adverbs to disambiguate the produced meaning.

2.4 Quantitative Studies of the Present Perfect

In this section, studies that focus on the present perfect (sometimes considered in isolation from other exponents of past temporal reference, sometimes not) are examined. The two major classes of studies of the present perfect are corpus linguistics studies and variationist sociolinguistic studies. Both differ from descriptive and semantic accounts presented above, by focusing on usage based data. Corpus linguistic studies tend to use large corpora of data from several genres (written and spoken) while variationist studies focus on vernacular speech (or proxies thereof). Finally, the quantitative methodology each uses to study the present perfect leads to different outcomes and is discussed in this section.

2.4.1 Corpus Linguistic Studies of the Present Perfect

There have been a number of studies of the present perfect conducted within the framework of corpus linguistics. As the methodology underpinning corpus linguistics frequently necessitates automated extraction of the target feature of interest, the focus of this approach has either been on the just the present perfect itself, or the present perfect considered in conjunction with other tense-aspect form (e.g., preterite, past progressive, etc.). These studies can be categorized into four major types, as depicted in 4 below.

Type	Forms	Examples
TYPE I	(Present Perfect Only): All of the present perfects in finite clauses are extracted from the corpus.	Schlüter (2000;2002)
TYPE II	(Present + Preterite): All of the present perfect and preterites are extracted from the corpus.	Yao & Collins (2013) and Elsness (2009)
TYPE III	(Present Perfect + Past Progressive + Past Perfect + Preterite): All finite past tense forms are extracted.	Mindt & Cornelsen(2000) and Biber, et al (1999)
TYPE IV	(Beyond finite clauses): All finite past tense forms are extracted and non-finite aspectually marked clauses (e.g. <i>to have walked</i> , <i>having walked</i> , etc.)	Elsness (1997)

Table 4: Corpus Studies of the Present Perfect

Even though the methodological frameworks that most corpus linguists and sociolinguistic variationist employ are different, there is some similarity between variable contexts studied when examining the present perfect. Type I contexts are rejected by variationists as violating the principle of accountability (Labov, 1972; van Herk, 2008:55-56) because of the focus on only one form (the present perfect). Type II studies offer a control on the counts of the present perfect by comparison with the production of the preterite. As previously discussed, a two form approach does not exclude contexts where the preterite cannot vary with the present perfect. Vermant (1983) is the only scholar in this framework of the corpus linguistics in Table 2 who excludes tokens from the analysis (have-got constructions)³.

In a number of corpus linguistic studies there seems to be decisions made to ensure that automated techniques can be carried out without involvement from a human analyst. An example of this is Elsness' (2009) data where the present perfect is analyzed (in alternation with the preterite) for 16 verbs that were chosen because each had "distinct forms for the preterite and the past participle, which made electronic searches for these forms possible even in the untagged corpora."(ibid:97) Elsness acknowledges in a footnote that there is variability that makes the assumption of mutu-

³These constructions such as *I've got three books* are thought to represent stative possessive rather than a true present perfect (see Tagliamonte, D'Arcy and Jankowski, 2010)

ally exclusive forms questionable (ibid:97 fn 7): “It is true that some forms of these verbs have unwanted homographs (e.g. saw, fell) which would be included in electronic counts. It was assumed, however, that these homographs were sufficiently infrequent not to distort distributions significantly.”

The corpus linguistic studies provide some descriptive facts about the present perfect in overall rate of occurrence in disparate sources of data. What is not present in these studies however is an analysis beyond the overall rates or surface forms- these studies do not control for the various linguistic contexts that constrain the present perfect. For example, we do not know if the comparison between two corpora in these rates are due to the change in the overall amount of resultative contexts. This argument can be repeated for each kind of perfect function. By failing to control for these contexts, there is an increased likelihood that differences between overall rates across corpora are over-interpreted.

Study	Forms Included	Type	Data Source
Korsakov (1969)	Present Perfect Only	I	3 monographs, 2 novels and one book on Industrial Electricity
Peterson (1970)	Present Perfect Only	I	10 modern American plays
Dubois (1972)	Present Perfect Only	I	Brown Corpus (Sample) [Expository prose]
Herzlik (1976)	Present Perfect Only	I	3 novels, 1 play and 1 technical novel
Vermant (1983)	Present Perfect Only (no have-got constructions)	I	6 American plays and 5 British plays
Meyer (1995)	Present Perfect and Preterit	II	2.4 million words of novels, journals and newspapers.
Elsness (1997)	All finite past morphology (Perfect, simple, progressive) and overt perfect non-finite.	IV	Historical Corpora and modern English usage from a variety of genres (newspaper, academic, spoken (modern) interviews, etc.)
Schlüter (2000;2002)	Present Perfect Only	I (no have-got constructions)	British and American English (2,232,020 words) of spoken, expository prose and fiction (CEC/LOB/BROWN corpora).
Hundt and Smith (2009)	Present Perfect and Preterit	II	Brown Corpus (British and American English)
Elsness (2009)	Present Perfect and Preterit	II	
Yao and Collins (2012)	Present Perfect and Preterit	II	BROWN(FROWN) and LOB(FLOB)

Table 5: Corpus Linguistic Studies of the Present Perfect

Table 5 is a summary of corpus linguistic studies of the present perfect. Much of the goal of corpus linguistic can be seen as oriented in one of two directions. The first direction, descriptive analysis, is centred on providing a synopsis of the use of the present perfect without *a priori* assumptions using data across multiple genres and regions of English. This represents much of the earlier work and culminates in Elsness's 1997 study of the present perfect from Early Modern English through present-day English within both British and US English. Later studies (e.g.

Schlüter 2000, 2002; Elsness, 2009; Yao and Collins, 2012) begin to focus more on cross-variety differences in rates of the present perfect versus the preterite and are motivated by Elsness's work on this topic.

The description of the present perfect in use is important. These studies, however, lack a cohesive theoretical account to explain their results. Other than the assertion, which underlies any corpus linguistic study, that linguists should be more concerned with produced sentences rather than sentences generated for speakers to present intuitions about, there does not seem to be a core account of the present perfect in most of the above studies. Schlüter (2000) is the only recent corpus study that discusses the resultative, experiential and continuative readings of the perfect while the other studies focus on the descriptive statistics that arise from their data. While there are many descriptive facts contained in the studies above, we focus on those that intersect with our research question about the effect of adverbial specification on the meanings associated with the present perfect.

Schlüter (2006) provides a survey of corpus linguistics studies and the present perfect and, unsurprisingly, finds that studies based on smaller sets of data find anomalous results in terms of overall corrected counts⁴ of the present perfect and overall rates of the present perfect versus the preterite. This is unsurprising from a statistical perspective as more data provides more stable results. Elsness (1997) provides a very detailed account of the present perfect and preterite in both Modern and Early Modern English, and argues that the present perfect corresponds to an indefinite temporal reference use versus a definite temporal reference use for preterites.

A number of studies have focused on the use of definite temporal adverbs (e.g. Schlüter, 2000, 2002; Hundt & Smith, 2009; Elsness, 1997). Schlüter, (2000) examines American and British corpora for all of the functions of the present perfect and finds that 20% of resultative present perfects co-occur with adverbial specification. For experiential present perfect forms, he finds those that express one event are marked at 22%, but those that express multiple events (including iterative events) have 40% specification. Continuative perfects occur with the most adverbial specification

⁴These corrected counts are numbers of occurrence per 100,000 (or some other amount of) words (see Walker, 2010: 73-74 for criticism of this approach).

(66%). The amount of adverbial specification for Elsness (1997:278-279) is in Table 6.

Period	% with Adverbial Specification	N
Old English	14	7
Early Mid Eng	17	46
1350-1400	37	73
1550-1600	24	131
1750-1800 British Eng	37	141
1750-1800 US Eng	29	181
Contemp Br Eng	32	333
Contemp US Eng	33	148

Table 6: Present Perfects with Adverbial Specification. Data from Elsness (1997:278-279)

2.4.2 Variationist Studies of the Present Perfect

Underlying a variationist approach is Labov's Principle of Accountability (1982:30), the dictum that in order to study a form we have to count not only where the form does occur but where it could occur and does not. Labov (1975:7) elaborates on this stating "the crucial step is the precise definition of the variable itself, so that it is possible to state the proportion of cases in which a given variant has occurred out of all those cases in which it might have occurred. Only then can we count items in a meaningful way and perform mathematical operations upon the data so produced." For those studies that focus on the present perfect itself, we have Winford (1993), Tagliamonte (1997; 2013), Davydova (2011) and van Herk (2008;2010).

The Present Perfect Context

Study	Variable Context	Type	Exclusions	Variety
Winford (1993)		PERFECT CONTEXT		Trinidadian English
Tagliamonte (1997)	“the competition of variant forms used in PRESENT PERFECT contexts.” (p. 329)	PERFECT CONTEXT		Samaná English
Van Herk (2008)	“All verbs with past temporal reference real or implied.” (p.53)	PTR	“ambiguous, passive and irrealis tokens.”	Ex-Slave Letters (19th Century Liberia)
Ritz and Engel (2008)	“Tenses used to relate past situations in narratives.”	PTR		Australian English [33 hours of radio recordings]
Davynova (2010)	“Essentially, the focus was on the verb forms that surfaced in contexts in which Standard English allows the present perfect.” (p.129)	PERFECT CONTEXT		Indian English; East African English; Singaporean English; Irish English; L2 English by Russian and German speakers.
Van Herk (2010)	“all verbal tokens of the form under investigation (PresPerf) as well as all tokens of the form it is supplanting, the preterit or simple past.” (p.51)	TWO FORM		Quebec English, Early Modern English

Table 7: Variationist Studies of the Present Perfect

In Table 7 we see a summary of the studies of the present perfect within a variationist framework.

The functional approach, represented by PERFECT CONTEXT in the table, represents an attempt

to circumscribe the present perfect function. Tagliamonte (1997: 338-339) following Winford (1993) lays out the readings she adopts as defining the present perfect context as the continuative, experiential and resultative functions: “Basically, the continuative perfect makes reference to a time span throughout which an event or situation obtained... the experiential perfect refers to a situation which has occurred once or repeatedly before the present...and the resultative perfect refers to a past situation that has led to some present result or state.” Davydova (2011) extends this approach by explicitly defining criteria she uses to categorize each of these functions (as well as a new function of “recent pasts”). An approach that casts a wider net into past temporal reference forms, represented by PTR in Table 7, uses all tokens with any past temporal reference and is illustrated in van Herk (2010). The remainder of this section discusses previous studies which use the readings of the present perfect as the variable context and connects it to the broader research question in the thesis.

Tagliamonte (1997:339) extracted clauses for her Samaná English data that fell under “discourse contexts which meet the functional definition of the present perfect.” The three categories contained in the functional definition of the present perfect employed by Tagliamonte are the resultative, the continuative and the experiential. Excluded from these are (ibid:338) “contexts in which the standard present perfect morphology occurs, but does not have the semantic function of the contemporary system.” Under this circumscribed context, Tagliamonte’s (ibid: 340) data has three major variants (N=372): Preterites (25%), Present Perfects (22%) and bare verbs (17%). No other forms accounted for over 10% of the data. If we examine the preterites examples provided in the paper, however, we see an interesting pattern (ibid: 330): All of the preterites that are claimed to occur in the variable context of present perfect function are underlined:

(24) They all died out already. (013/80)

(25) But I don’t know what took her now. (015/245)

(26) They didn’t send it to me yet. (022/390)

(27) The killed a lot that time, yes they killed a lot. But today we calmed off and everything

and got calm. (002/116)

Overt adverbial marking distinguishes (24)-(27). Every preterite that is used as an example occurs with an adverb claimed to favor the present perfect: *already*, *now*, *yet* and *today*. Examples for each of the other variants occur without this adverbial marking. Thus, it seems that present perfect forms are assumed to have a present perfect function. Whether or not such adverbs occur with every non-present perfect form in her study cannot be established from Tagliamonte's description of her methodology. Nevertheless, such an approach would potentially over count present perfect forms while under counting the preterite forms. We do not know, however, what readings for the present perfect rely on adverbial support and which are embodied by the form itself.

Davydova (2011:120) expands on variable context for present perfects by including all tokens which "refer to some state at speech time which arises from some past situation." Davydova lays out what appears to be a fairly algorithmic manner (ibid:124) of extracting the present perfect tokens (of both present perfect form as well as other variants) by first determining the continuatives, then resultatives, then experientials and finally recent pasts. Once a token is not classifiable as any of those types, it is excluded from her analysis. When we attempt to apply the described context to her examples, however, we find the same indeterminacy discussed for the previous study. Consider for example the following two examples that are included in her original study (Davydova, 2010: 141):

- (28) Indian English (ICE:S1a-100): (Speaker A)-Sir, about that Chaya, I received a letter from the director of school education about Chaya Katti. Could you tell me something about it sir? (Speaker B): Even I don't know anything about it.
- (29) Irish English (HCIEL: CarroJ11): Dear Brother William, I have received your letter of the 13th November with great pleasure to hear you and your family are all well as these few lines leaves me and family at present, thank God for His goodness.

In both (28) and (29) we have the lexical verb *receive* functioning in what Davydova claims to be a present perfect context. The first example marked with preterite morphology and the second

surfaced as an overt present perfect. Davynova acknowledges that no overt marking (i.e. an adverb) takes place in the two examples above, but the event in (28) is of “a certain relevance for the speakers at the moment of utterance”(ibid:141). Further, she argues that the “discourse context unambiguously implies that the event occurred fairly recently” for both (28) and (29). There is nothing in (28) (which is reproduced verbatim and entirely from Davydova,2010) that indicates how distant the act of receiving the letter is from speech time⁵. Should speaker A in (28) add ‘yesterday’ or ‘6 hours ago’ after ‘receive’, there is nothing that would contradict this (at least in this token) and this would not render the letter less relevant. It would, however, exclude this token from Davydova’s analysis (as she earlier states that (ibid:131) ‘yesterday’ and definite temporal adverbs in general are incompatible with the function of the present perfect). So, for preterite forms, it is only the absence of a definite temporal adverb and the analyst’s assessment of current relevance at the moment of utterance for a token that render it eligible for inclusion in the variable context for the function of the present perfect. Certainly, Davydova’s approach is more circumscribed than the previous functional approach, however, there is still an indeterminacy in its application that would generate different outcomes for different analysts. The relationship between the present perfect form, present perfect meaning and adverbial modification, as stated before, affects the analysis.

In terms of examining historical change as Tagliamonte (1997) does or across multiple varieties of English influenced by contact as Davynova (2011) does, such indeterminacy might be argued to not be important since each research question is focused on the linguistic conditioning via a multi-factor analysis. The present perfect variant in such an analysis could be expected to perform the same as it would within a narrower (or more perfect) variable context. There is a counter argument in van Herk, (2008;2010) that such an approach which relies on overt marking for non-present perfect forms, but requires no such overt marking for the present perfect forms themselves, runs the risk of the non-present perfect forms appearing to be more ‘perfect’ than the present perfect form itself. In order to assess whether or not the preterite is occurring with the present perfect function, however, we have to be absolutely clear on what we are delineating as the present

⁵The *of the 13th November* modifies the letter not the event of receiving

perfect function. A wide variable context (i.e. the inclusion of ambiguous preterite forms) could lead to the conclusion that the preterite is more frequent in the present perfect context than it actually is. A narrow variable (i.e. including all present perfect forms but only the preterite forms with overt adverbial marking indicating present perfect function) could lead to similarly erroneous conclusions. The relationship between these overt markers of meaning, that is the adverbs, to the present perfect form itself needs to be fully understood before these functional approaches can be fully evaluated.

2.4.3 Competition of Past Temporal Reference Forms

One main finding that has been replicated across several corpora for different genres is the lower frequency of the present perfect in American English versus British English (Schübert, 2001; Hundt and Smith, 2009). American English uses less present perfect forms than British English in Schübert's and Hundt and Smith's data. Yao and Collins (2012) present a study of all of the varieties available in the International Corpus of English. The International Corpus of English is a mega-corpus of twelve different varieties of English. Yao and Collins find that the overall rates of present perfects (versus preterites) vary between 7% and 15% with American English at the low end and British English at the high end. It is not clear, however, if these rates are meaningful, in that the overlapping contexts discussed above are not controlled for in Yao and Collins data: that is there are claims about overlapping meaning in *some* past temporal reference contexts, not all such contexts. Further, as Poplack and Tagliamone (2001:92) argue, there are number of extra-linguistic reasons that precipitate overall rate fluctuation of a given variant such as "data collection procedures" or "interviewer technique".

A narrower finding by Hundt and Shubert (2009) in their cross-corpora study of the distribution of the present perfect versus the preterite form (while excluding modal uses of the perfect) in the context of *already*, *yet*, *never*, *just* indicates that these reported regional differences still persist within these adverbial contexts (with simple preterites occurring at a higher overall rate with these adverbs). An increase in the amount of preterites with respect to the amount of present

	Old English	Early MidE	14th	16th	18th British	18th American	20th British	20th US
% Present Perfect	0	0	0	11	42	28	53	75
Total N	1	10	5	9	12	14	15	4

Table 8: Data from Elsness (1997:294-295)

perfects might very well correlate with the encroachment of the preterite into present perfect contexts. Certainly, the studies by Schübert (2006) and Hundt & Smith (2009) have assumed so. In order to establish that the preterite is encroaching on the present perfect, we must show that the preterite is used more frequently in present perfect contexts. We, however, first need to identify the contexts and range of meanings associated with present perfect in the absence of overt adverbial specification.

One of the main conclusions of Elsness's (1997:348) study is that his "investigation has established that the frequency of the present perfect is already declining in American and quite likely also in British English, the preterite being selected instead." This implies that there is an increase of the preterite with a present perfect meaning. When we look at continuatives, for example, we find that this claim of encroachment fails to hold. In Table 8, the results from his data⁶(ibid:294-298) for continuative contexts (those events that are "not clearly separate from the deitic zero point") are reproduced with the total number of tokens and the percent of his data that are present perfect forms for each period.

We can see no decrease in the use of the present perfect diachronically for either US or British data. There are cross-dialectal differences (British using far less present perfect forms in these contexts) at different time periods. What we do not know about the preterite forms, however, is whether they truly have a continuative meaning or simply lack any evidence to the contrary (i.e. 'no clear distinction from the deitic zero (speech time)'). Both the quantitative claim that modern English speakers use less present perfect and the qualitative claim that there are contexts where the present perfect and preterite alternate freely require a more detailed understanding of what component of meaning the forms themselves contribute (i.e. the present perfect and preterite morphology) and the contribution of adverbial specification.

⁶His data are from a variety of sources that include books, letters, etc. from the time period.

From a variationist perspective, there are two ways to delimit the context of present perfect meaning (i.e. identifying not only present perfect forms themselves but also preterite forms that have a present perfect reading). If the present perfect form itself carries the entire semantic weight of the readings attributed to it, then how can we take variants such as the preterite, whose apparent meaning to an analyst only is available through adverbial or pragmatic information, as having the ‘same meaning’ (this is an extension of the argument presented in van Herk(2010) against a ‘Black Box’ approach). Further, this approach requires the analyst to take one of two possible methodologies to extract non-present perfect forms that could have a present perfect meaning. The first is a broad approach that takes all non-present perfect forms that have a definitive present perfect reading via adverbial marking. The second approach, a broader one than the first, would be to extract all non-present perfect forms that do not occur with definite past adverbs or in definite past contexts. The functional approach applied by Tagliamonte (1997) and Davydova (2011) fall somewhere between these two extremes (as discussed above). Both approaches (and those in between) rely on two unverified assumptions. First, that every present perfect form maps onto at least one reading of the present perfect and, thus, can be included in a variationist study of the present perfect function. Second, adverbial support with present perfect forms only enhances or reinforces this meaning, but may be required to generate these readings with non-present perfect forms.

2.5 Summary

This chapter reviewed the synchronic literature that is a foundation for this dissertation and our discussion of the diachronic literature in the next chapter. The tripartite distinction between the readings of the present perfect were presented and exemplified (Resultatives, Experientials and Continuatives). The components of lexical aspect from Olsen’s (1997) work were then presented. The methodologically and theoretically important question of what forms beside the present perfect can achieve present perfect function was considered from a variationist perspective. The research

question of this dissertation, however, can inform all analyses of the present perfect across the different frameworks: does the present perfect itself have a broad meaning of current relevance that is then associated with one of the main readings via adverbial modification or does the present perfect itself generate these readings with adverbial support only reinforcing the meaning in speech. The answer to this question will provide a clear context for variationist and corpus linguists to extract and trace valid alternatives to the present perfect form that yield the same reading in different varieties of English and genres of text and will also provide data to further inform syntactic and semantic accounts of the present perfect meaning in English.

Chapter 3

The Historical Development of the Present Perfect

3.1 Introduction

As discussed in the previous chapter, there is an ambiguity in where the meaning of the present perfect itself begins and what is contributed by or even requires an adverb. There has been limited discussion of how adverbs interact with the present perfect meaning from Old English through Modern English. The morphological marking of the present perfect form has existed since Old English, as seen in example (1). Comparison with historical varieties enables us to characterize synchronic variation in modern Canadian English by determining whether contemporary patterns of variation are the reflex of change or represent stable variation that has perdured for centuries (Labov, 1980:viii; Milroy & Gordon, 2003: 179). This chapter surveys what is known about the historical development of the present perfect.

- (1) Ic hæbbe nu ongiten þæt ðu eart gearo to ongitan-ne mina lara.
I have now understand-PCP that you are willing to understand-INF my teachings.
'I have now understood that you are willing to understand my teachings.'

9th Century (YCOE/coboeth/Bo:36.107.32.2111)

Section 3.2 in this chapter summarizes the development of the present perfect from Old English to Early Modern English. There is also a discussion of McFadden and Alexiadou's (2010) study of HAVE and BE as perfect auxiliaries in English and why I use their conclusion that Be-Perfects are not true present perfects. Section 3.3 provides an overview of the grammaticalization of the present perfect in both English and cross-linguistically. Section 3.4 provides a motivation for our variable context presented in the next chapter with historical data that illustrate the variation between the presence and absence of adverbial support with the present perfect.

In this chapter, I use the term *perfective* to describe a stage of the predicted grammaticalization of the present perfect. The term *perfective* has been used by scholars to describe different phenomena and features prominently in the variationist literature on the grammaticalization of the present perfect. The primary definition of a perfective event refers to “a single event as an unanalyzed whole, including its starting point and its end point” (Singh, 1998:172; Comrie, 1976; Smith, 1997) which is contrasted with *imperfective events*. Within grammaticalization studies and especially variationist studies, this term has been used primarily to contrast with the present perfect's putative function of overlapping with speech time. For example, Copple (2010:164) defines a perfective event as “completed prior to and detached from the moment of speech.” Identifying perfective use in actual speech requires identifying some marker of definite past meaning. Indications that the present perfect form had acquired perfective properties could include the use of definite past adverbs with a present perfect form (e.g. *yesterday*, *last year*, etc.) or the use of the present perfect in sequences that depict narrative events where the preterite would be expected. I retain the use of *perfective* from the grammaticalization literature in this dissertation.

3.2 The Development of the Present Perfect

As described in Denison (1993: 340), the present perfect with HAVE as an auxiliary originated in the resultative construction from the possessive use of HAVE. In modern English, we have the present perfect as in (2). The original form of the present perfect is in (3) and the second structure,

(4), is thought to have developed from it. We later discuss some of the controversy relating to the period in which this transition took place, and examine whether the full range of present perfect meanings found in Modern English were available in Old English. Whether or not both (3) and (4) were available in Old English, it is uncontroversial that by the end of Middle English, (4) is productive.

(2) John has read the book.

(3) John [_{VP} [_v has] [[_{NP} the book] [_{Adj} read]]]

(4) John [_{VP} has [_v read] [_{NP} the book]]

The present perfect has these two possible parsings or syntactic analyses associated with two different meanings throughout much of the history of English. In Old English, however, the meaning of the present perfect is claimed to be exclusively resultative, which corresponds with the syntactic analysis in (3) rather than the one in (4).

3.2.1 Old English

The present perfect in Old English is usually assumed to have originated in the resultative construction, seen in (5)-(7). The examples in this section were extracted from the York-Toronto-Helsinki Parsed Corpus of Old English Prose (YCOE) (Taylor, et. al, 2003) with the Corpus Search program.¹

This HAVE + participle construction has been taken to be a proto-present perfect or more simply a resultative construction. The loss of agreement between the participle and the object in the *have* perfect construction and the loss of agreement morphology more broadly occurred throughout the Middle English period²(Lass, 1992). Throughout the Old English period, the question of whether or not the perfect encoded the array of readings present in Modern English has been

¹The translations provided are my own.

²Yet, even during Old English, as discussed later, the agreement between the object and participle in a present perfect construction was not frequent.

debated as some scholars argue (e.g. Traugott, 1972; Visser, 1978; Carey, 1994, 1995) that the present perfect form in Old English is only resultative. There are four claims which support the opposing view that the present perfect had available all of its readings (Mitchell, 1985; Brinton, 1988; Trask, 1996; Lee, 2002; Wischer, 2004) and these are:

- The high percentage of perfect forms that lack agreement between the object and participle.
- A possessive meaning of HAVE is not present in many present perfect forms.
- Some present perfects appear with intransitive verbal participles.

- (5) **Habbe** ic +te awer **benum-en** þinra gifena þara
 Have I you-DAT.SG anywhere PAST-deprive-PCP your gift.GEN those.GEN
 ðe from me com-on?
 that.COMP from me come-PST.IND?
 ‘Have I deprived you anywhere of those your gifts that to you came from me?’

9th Century (YCOE/Coboeth/Bo:7.17.17.272)

- (6) Nu ic **hæbbe** ge-stryn-**yd** oðre twa.
 Now I have PAST-gain-PCP PART two.
 ‘Now I have gained another two.’

10th Century (YCOE/Cowsgosp/Mt:25.22.1765)

- (7) Nu ic **hæbbe** eow areht rihtne **geleafan**.
 Now I have you-DAT explain-PCP correct faith.
 ‘Now I have explained to you the correct faith.’

11th Century (YCOE/cowulf/WHom7:159.499)

The examples in (5)-(7) exhibit some components of both an adjectival relationship and some more modern features of the present perfect. In (5), the dative singular object surfaces between the HAVE form and its complement participle. In (6), the object surfaces postposed to the participle. In Middle English and through Modern English, the structure of (5) become less and less frequent, but does not disappear in all varieties of English (e.g. Hiberno English “I have the letter written.” in Harris, 1984).

Lee (2002) finds that in the 55 tokens of the *habban* + participle construction in his Old English data, 10 could have either existential or continuative readings. Six of these 10 have possible existential readings and four have possible continuative readings. A major weakness of Lee's data, however, is that the vast majority of it comes from poetry. The possibility that these reflect the underlying semantic distribution of the present perfect in Old English cannot be easily established from such data especially when the use of the present perfect form was sometimes for metrical rather than semantic purposes in Old and Middle English poetry. Whether or not the present perfect form had non-resultative readings available is, however, irrelevant to our research question. There is no disagreement on the fact that by the beginning of Early Modern English, the present perfect form was established in English with its modern readings (Carey, 1994).

3.2.2 Middle English

The present perfect form in Middle English displays a considerable amount of variability in meaning. This section presents some descriptive linguists' views about the present perfect during this time and concludes with a critique and possible alternative responses. Many of the readings, as shown in this section, represent claims about the psychological state of the writer that can be difficult, if not impossible, to assess, especially in historical data. We return to this difficulty at the end of the section. The examples in this section were extracted from the second edition of the Penn-Helsinki Parsed Corpus of Middle English (PPCME2) (Kroch and Taylor, 2000) with the Corpus Search program. The translations provided are my own.

- (8) he **haueð** muchel **idon** us & mare **bihaten**. (ca. 1230)(PCME2/cmancriw/II.283.630)
[Modern English: He **has** much **done** (for) us and greater **promised**].
- (9) Certayn- he alone to whom he **hap inspired** schuch a wil and y+gyue power to performe.
(ca. 1400) (PCME2/cmaelr3/26.13) [Modern English: Certainly, he alone to whom he **has inspired** such a will and given power to perform.]
- (10) and there he seyde- 'My synne and my wyckednes **hath brought** me unto grete dis-

honoure!(ca. 1430)(PCEME2/cmmalory/654.4446) [Modern English: And there he said:
My sin and wickedness **has brought** me to great dishonor.]

Studies of Middle English and Early Modern English usually introduce the readings available to the present perfect in Middle English under some general category of current relevance and then provide a taxonomy of more specific readings that might map on to the major readings discussed in the previous chapter or might map on to amalgamations of these categories (or to wholly unique readings). A critique of these approaches is presented at the end of this section

Curme (1931) sees the general function of the present perfect to relate a completed event to the present. He claims that the present perfect (ibid: 358) originates from Latin/Greek models. The first intransitive environments in Middle English that the HAVE perfect spread to are durative under his analysis. The present perfect form is argued to be more ‘calmer, detached’ (pg. 359) than the ‘vivid’ preterite. He presents no taxonomy. Mustanoja (1960:502-503) recognizes the general current relevance function of the present perfect in Middle English and discusses several readings that are possible. In Old English, the preterite was the morphological form used to express current relevance, but as Middle English progressed, the present perfect acquired this function, under his analysis. The first specialized reading he discusses is what he terms “psychological”. The length of the present perfect form (versus the simple preterite) gives it a “more emphatic” reading, because, under his analysis, it takes longer to say. This yields a ‘desirable’ form for indicating current relevance. He claims that a number of manuscripts written at the beginning of the Middle English period have preterite forms that, when these same manuscripts are found copied later in the Middle English period, appear as present perfects. These present perfects occur both with and without adverbial support (lexical, phrasal and clausal). Mustanoja (ibid: 500) argues that HAVE (Old English *habban*) originally occurred with only “perfective transitive verbs” but by beginning of the Middle English period, even intransitives had begun to use present perfect HAVE. Echoing the claims above, Visser (1978) finds that the present perfect is used when the past “has a bearing on the present” (ibid: 751). He observes that in narratives the lifetime constraint discussed later in this section can be overridden, especially in Middle English data. In Early Middle English and Old

English he argues for free variation between the present perfect and preterite in order to create a certain metre. In Middle English he also notes the occurrence of the present perfect form with past definite adverbs.

Many of the explanations for particular instances of the present perfect routinely invoke one of its three conventional readings (resultative, experiential, continuative). When these readings insufficiently account for the particular use of the present perfect, grammarians typically resort to explanations that appeal to some psychological state of mind or suggest stylistic motivations (i.e. metre) as justification for present perfects forms that seem to be operating outside of a modern present perfect function. These motivations are inaccessible to the modern analyst. Such criticisms are regularly rehearsed in variationist studies addressing the present perfect in English and other languages, as well in variationist research addressing tense-aspect forms more generally (e.g., Poplack & Turpin 1999). Sankoff (1989) argues that forms cannot be mapped onto one and only one function or set of functions. Although different forms may be preferentially associated with certain meanings in specific contexts, these meanings do not necessarily come into play in either the intentions of the speaker or the interpretation of the addressee each time a form is used. In such cases, the meanings or functions associated with a form can be neutralized in discourse.

3.2.3 Early Modern English

Trnka (1930:26) recognizes four uses of the present perfect during the Early Modern English period (ca. 1450-1700) after summarizing the unifying function of the present perfect as present relevance. The first reading, illustrated in (11), resembles the continuative reading in the previous chapter, with the additional stipulation that the event “will probably continue after this time.” The second use, illustrated in (12), is an immediate past where the present perfect indicates an event that has just occurred prior to speech time. The third reading, illustrated in (13), is what was termed a resultative in the previous chapter. The final use, illustrated in (14) is where the present perfect indicates an action that is not definitely anchored temporally. Missing from this taxonomy is the experiential reading of the present perfect. Denison (1993) notes that by Early Modern English

(ca.1450), most of the bracketed constructions (where the object occurs between the participle and HAVE) have almost disappeared. During the Early Modern English period, the present perfect is characterized as having the same range of meanings as in Modern English (Carey, 1994; Rissanen, 1999).

- (11) I **haue** not **bine** so well for aboue this weake as I use to be- [ModEng: I **have** not **been** so well for above this week as I used to be.] (CELY/137.111.2447)
- (12) Deare mother May it please yow- I **have** this day according to your command **beene** with my brother Barrington. [ModEng: Dear Mother, May it please you – I **have** this day according to your command **been** with my brother Barrington (PASTONK/77.047.841)
- (13) They **have** allready **been** uppon the stage- and heertofore so playd their parts-as the same is again to be expected; [ModEng: They **have** already **been** upon the stage- and heretofore so played their parts as the same is again to be expected.] (PASTON/316.105.3201)
- (14) and moreouy I **haue ben** x tymes in lyke case ore werse wyth-in thys x wekys. [Mod-Eng: Moreover, I **have been** 10 times in like case or worse within this 10 weeks.] (OXIN-DE/122.074.1045)

3.2.4 Lifetime Constraints

Much of recent semantic discussion of the present perfect focuses on various instantiations of what is termed the *lifetime constraint*, which I define below, and seems to have come from historical descriptive accounts of the present perfect. I provide in this section a broader overview of lifetime constraints and trace the origin of these constraints back to the assertions of eighteenth and nineteenth century grammarians.

An eighteenth century grammarian, White (1761:84) states that the present perfect has to be used "with persons now existing" and Pickbourn (1789:32) extends this by allowing for dead grammatical subjects, but only if their work (art, poetry) being discussed is extant: the present perfect is

appropriate ”when we are speaking of the works even of those long deceased, provided they be still extant; but if those works do not remain, we cannot with propriety use it. We may say, Cicero has written orations, but we cannot say Cicero has written poems. In the first instance, by a bold figure, we suppose Cicero, as it were, still existing and speaking to us in his orations, but as the poems are lost we cannot mention them in the same manner.” Both of these 18th century grammarians’ statements are precursors to issues that have generated much discussion in the modern semantics of the present perfect. Even so, most linguists who have commented on the present perfect do not see death entirely as preventing a grammatical subject occurring with the present perfect– there seems to be a path for this constraint to be pragmatically overridden. Pickbourn’s pragmatic override occurs when the direct object is still extant even though the grammatical subject is not. The rest of this section addresses how these *lifetime* effects are dealt with in a modern framework and the pragmatic overrides that linguists create to allow for exceptions to this constraint. For the remainder of this work, I refer to the constraint against a grammatical subject who is dead or who is no longer in existence co-occurring with a present perfect form as the LIFETIME CONSTRAINT of the present perfect.

It seems that the historical descriptive accounts of the present perfect discussed above provide the basis for much of the contemporary discussion of the semantics of the present perfect. The famous set of examples for this constraint in modern linguistics comes from Chomsky (1970:86-87). (16),(18),(20) and (21) are supposed to be marginally acceptable (indicated with #). The sentence in (15) presupposes that John is alive while (17) does not presuppose that Einstein is living. The sentences (22) - (24) do not presuppose that their grammatical subjects are still in existence.

(15) John has lived in Princeton (# if John is not alive at time of utterance).

(16) # Einstein has visited Princeton.

(17) Princeton has been visited by Einstein.

(18) # Einstein has taught me physics.

- (19) I have been taught physics by Einstein.
- (20) # Hillary has climbed Everest.
- (21) # Marco Polo has climbed Everest.
- (22) Marco Polo and Hilary have climbed Everest.
- (23) Everest has been climbed by Marco Polo (among others).
- (24) Many people have climbed Everest.

Chomsky's use of these differences in interpretation and presuppositions is part of a larger discussion of surface structure versus deep structure. His main point is that some information contained at surface structure (and beyond to the pragmatics of conversation) can influence the semantics of a particular form. Thus, semantics operates at two levels (under Chomsky's analysis): one at deep structure and one at the surface (linear) readout of a sentence. In a more modern analysis, however, we would say that the present perfect operates with some basic core semantic meaning (entailments) and some implications that can be pragmatically overridden (implicatures), but still have a root in the underlying semantic reading. Portner (2003) explains that the present perfect example in Einstein would only be allowed in response to a question about nobel laureates, since he would no longer be the focused topic, but one of a list of many scholars. The *extended-now* of the discussion would be reset by the question to include all events associated with visiting Princeton. The passive-transformation (i.e. Princeton has been visited by Einstein would also have the same effect). Another example discussed by Portner (2003: 464) via McCoard (1978) is (25):

- (25) # Gutenberg has discovered the art of printing.

Portner reasons (25) is *unacceptable* due to Gutenberg extended-now no longer existing at speech time. One way, posited by Portner (ibid:506) for (25) to be acceptable is if an immortal demon uttered it. The imagined immortality would provide that the event of Gutenberg discovering the press would fall within the extended-now of the demon's utterance.

What have been termed lifetime constraints has been extended beyond the existence of the arguments to possibility as well. A regular interpretation of lifetime constraints renders the sentences in (26) and (27) from Kiparsky (2002:4) as unsurprisingly ungrammatical. If we assume that *Fred* is a real living person, then what blocks these two examples is the possibility of occurrence in the future (or recent past). *Nazi Germany* no longer exists and therefore it is not possible to visit. The same argument holds for Fred and his Parisian birth, if Fred is an adult.

(26) # Fred has visited Nazi Germany.

(27) # Fred has been born in Paris.

The difficulty that any variationist has applying the claims about lifetime constraints is based on the paucity of produced sentences that would trigger these constraints as well as the inability to distinguish when the lifetime constraints are overridden because of pragmatic inference, which many semanticists allow for, or because the semantic accounts themselves have failed to appropriately delineate the truth conditions for the present perfect. So, if it possible to override the lifetime constraints for pragmatic reasons, as in the Einstein examples above, then it becomes unfalsifiable in a study of produced speech because both explanations produce the same surface form. Further, the sentences in (26) and (27) could also be ungrammatical simply because of temporal distance of the predicates and due to lifetime constraints. It is unclear how to fully disambiguate the effect of temporal distance of an event from lifetime effects and their extension. Establishing the contribution of adverbs to the meaning of the present perfect might provide some explanation for lifetime constraints that can be operationalized in spoken data.

3.2.5 The Present Perfect as Preterite in Earlier Englishes

Several scholars have highlighted the existence of examples such as (28) in earlier varieties of English in which a definite temporal adverbial co-occurs with the present perfect. Modern English is thought to prohibit what Mustanoja (1960) terms the ‘historical perfect’. Visser(1978) claims that this occurrence ends with Middle English while Fridén (1948) claims that this continues into

the Early Modern period and Harris (1984: 315) notes such examples as *I've done a course two years ago* in modern Hiberno English. Bauer (1994: 401) claims that sentences of the type 'I've seen it last week' are increasingly used in New Zealand English, and Trudgill (1894: 42) likewise claims that there has been an increase in such constructions in southern British English.

(28) Many Greke þat day fatally **haþ lorn** His lif (Lydgate, 1420)

'Many Greeks that day fatally **(have) lost** his life.'

Grammarians routinely invoke metrical, semantic, pragmatic or psychological considerations to explain examples such as (28). Curme (1977:360) sees the present perfect as more neutral and detached (versus the preterite) and might be used when a neutral tone is desired even when there are definite past time adverbs. Visser(1978:752) claims the use of the present perfect with definite temporal adverbs happens because a speaker is relaying a story. Moreover, even lifetime constraints can be overridden under these circumstances. He also notes that many times, in Old English and Early Middle English, the present perfect might be used for metrical purposes rather than semantic ones (ibid:713). Both McCoard (1978:232) and Bauer (1970) contest this claim as there are some present perfects in past definite contexts that are not more advantageous for meter or rhyme than the preterite. Mustanoja (1960:506) suggests that the present perfect might be used to emphasize the main actions of a story even when there are definite time adverbials. He extends this claim by arguing that the present perfect (versus the preterite) is meant to cause a strong emotion in the reader. Finally, Fridén (1948) merely states that there is stylistic variation that can cause the present perfect to be used with definite time adverbials. McCoard (1978) addresses this issue in detail and argues that two separate syntactic forms (i.e. the present perfect and the preterite) must be distinguished in some manner of meaning, even if that distinction is not presently accessible. This allows the doctrine of form-function symmetry to remain intact even when the putative semantic or referential distinctions between the two forms is not available to the analyst. Such uses of the present perfect form are returned to in Section 3.3.1 as there are modern varieties of English

that display similar patterns.

3.2.6 BE Perfects

- (29) This floure for the west part **is** already **laid**. [Modern English: The floor for the west part is already laid.](PCEEC/BACON/266.185.3255)
- (30) Thay say he will not allowe the title to discend to posterity of them which **are made** alredye. [Mod Eng: They say he will not allow the title to descend to posterity of them which are made already.] (PCEEC/KNYVETT/69.009.260)
- (31) I **am** alredy **entered**. [ModEng: I am already entered.] (PCEEC/ORIGIN2/131.013.177)
- (32) He is come.
- (33) She has slain the dragon.

A form that has been ignored in the previous discussion, but is often mentioned when the historical present perfect is surveyed in English, is the so-called BE perfect as illustrated in (29)-(32). This section describes some of the claims which are made about the BE perfects in competition with the HAVE perfect in earlier Englishes and, importantly, McFadden and Alexiadou's (2010) study of the BE and HAVE perfects in earlier forms of English (This is abbreviated to MFA for the remainder of this subsection). MFA's account provides the basis for our exclusion of the BE perfect from consideration in the remainder of this dissertation.

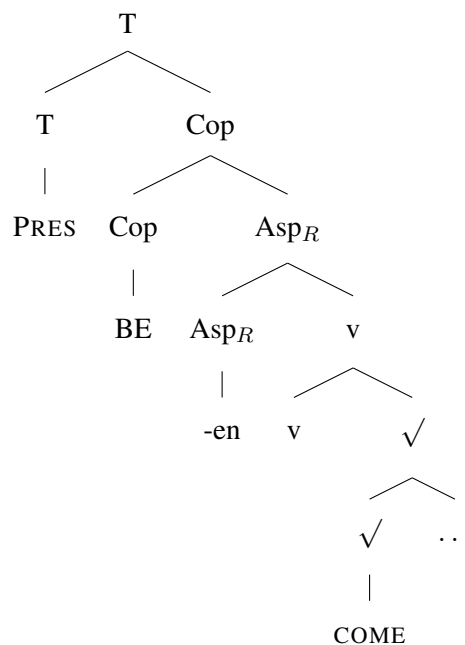
The use of BE + past passive participle in Modern English are so infrequent that Quirk, et al. (1985) label them a 'pseudo-passive' construction rather a perfect. They are thought to be much more productive in earlier English. Denison's (1993) survey of the perfect observes that the use of the BE perfect began in Old English intransitive constructions and, echoing claims from Visser (1978) and Mustanoja (1960), slowly lost ground to the HAVE perfect (which was established in transitive constructions) until its obsolescence in Standard English in the 19th century. Mutative verbs, as exemplified in (34), are thought to be a favourable linguistic context for BE perfects to

occur even in some modern varieties of English. Mutatives are copular constructions (intransitive) that represent a change of state as in (34). Denison's (ibid: 359) claim that the majority of BE perfects occur in mutative contexts has been reinforced by Tagliamonte's 1997 study of Samaná English where she found that BE perfects occur more frequently with mutatives.

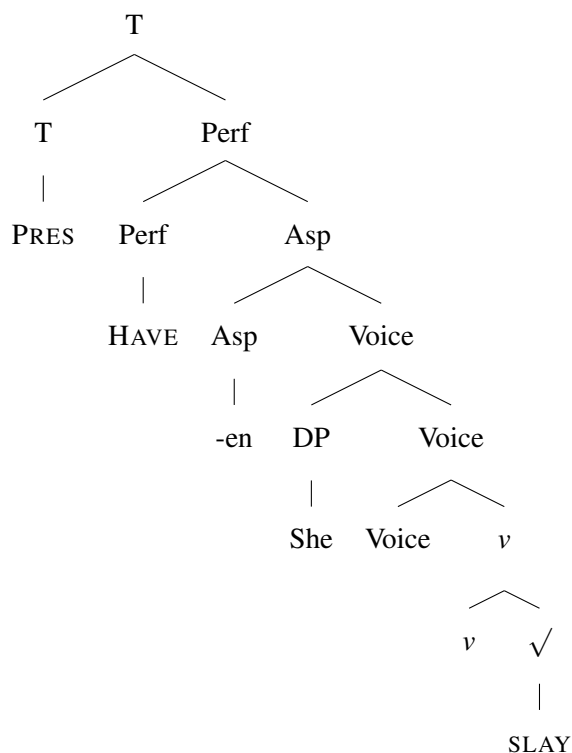
- (34) Yet Benedicke was such another; and now **is** he **become** a man. (Shakespeare, Much Ado about Nothing, III.iv.86)

The discussion above is what MFA term the 'standard account'. The principle focus of MFA's work is to establish that the perfect with BE, of the form (32), has a different syntactic structure, represented in (35), than the perfect formed with HAVE, exemplified in (33) with the structure of (36).

(35)



(36)



The major difference between HAVE and BE perfects under MFA's analysis is that HAVE has a Perf head that allows for the non-resultative readings of the present perfect to be generated whereas BE lacks this aspectual head and thus, BE perfects can only generate a resultative reading and not the broader anterior readings (i.e. continuative and experiential³). MFA observe that BE perfects retain a kind of 'proto-perfect' structure where a resultative participle is a complement to the copula BE. For HAVE perfects, MFA argue that the resultative participle combines with the Perf head (here filled by HAVE) to generate not only a resultative meaning, but the other possible perfect readings.

While others have argued that HAVE replaced BE across Middle English through Modern English in intransitives, MFA report that for their data, Penn Helsinki Corpus of Middle English, 2nd Edition and the Penn-Helsinki Parsed Corpus of Early Modern English, the frequency of BE perfects remain stable throughout Early Modern English. Their data is reproduced in the Table 9. As demonstrated by their data, the amount of BE perfect per the number of clauses is stable across

³I have not found any reported uses of BE perfects with these two readings in a variety of modern or historical English.

time which leads them to conclude that there is no major change in the structure of the BE perfect. The BE perfect did not decrease in use with the putative encroachment of the HAVE perfect, but retained a stable and low frequency from Old English through Early Modern English. In their data, the amount of BE perfects never rose above .45% of the total amount of clauses and fluctuated between .30 and .45 without a stable decrease across the time span of the corpora (the exception to this range is the beginning Early Middle English period which dipped to .13, but corresponds to a relatively low number of BE perfects (n=29) when the rest of the time periods have at least 4 times that amount).

Period	Number of Clauses	BE Perfects	% of BE Perfects
1150-1250	44,050	152	.35
1250-1350	22,958	29	.13
1350-1420	74,294	223	.30
1420-1500	39,737	145	.30
1500-1569	79,756	295	.36
1570-1639	94,378	421	.45
1640-1710	79,792	276	.35

Table 9: Data from McFadden & Alexiadou (2010:416)

Further supporting the structural distinction between the two types of perfect is a prediction that comes from the syntactic analysis: doubly marked perfects. If BE and HAVE occupy different heads, then surely they can surface together (with HAVE taking precedence)? MFA report (2010:415) they find 8 of these constructions in their data and, crucially, no tokens where BE takes precedence. The results presented by MFA are convincing and their main result, that the BE perfects are separate constructions from HAVE perfects for Early Modern English, is sustained in this dissertation. Thus, if we are interested in the interaction between present perfect readings and adverbial marking, we can set aside BE perfects as a proto-perfect form that does not manifest the broad use of the HAVE perfect in Standard English. There are some non-standard varieties of English in which the BE-perfect is still productive (e.g. Tagliamonte, 1997). For Canadian English, there is no evidence in our data, discussed in Chapter 4, that this form is still productive.

3.2.7 Summary

The history of the present perfect for English that has been presented in this section draws on several frameworks. In each, what constitutes present perfect meaning and constrains the use of the present perfect is debated. The identification of the period in which the present perfect acquired the meanings associated with its contemporary use has been the subject of much discussion in the literature. While there is some tentative evidence indicating that its contemporary meanings were instantiated as early as the Old English period, it is uncontroversial that its contemporary meanings were established by the Early Modern English period. Finally, BE-perfects occur in English, but McFadden and Alexiadou's (2010) data and analysis allow this form to be set aside.

3.3 Grammaticalization of the Present Perfect

Grammaticalization is the process by which lexical items become grammatical and grammatical items become more grammatical (e.g. Hopper and Traugott 2003:1; Traugott, 2003: 624). Recent variationist work has tried to uncover the 'micro-processes' (Copple, 2010) underlying the transitions from present perfect to preterite proposed in the literature on grammaticalization theory (Poplack, 2011). In this section, I discuss the broad path of grammaticalization reported for the present perfect cross-linguistically. Then, recent variationist work addressing the grammaticalization of the present perfect in contemporary and historical varieties of Spanish and French is discussed with a view to elucidating the grammaticalization pathway of the present perfect in English. The present perfect form and its reported semantic constraints in other Germanic languages are then analyzed briefly. Section 3.3.1 discusses specific varieties of English in which the present perfect may instantiate an advanced stage of grammaticalization vis-à-vis other varieties.

Hopper and Traugott (2003: 130-132) observe that not all forms undergo grammaticalization in the same manner: "A particular grammaticalization process may be, and often is, arrested quite before it is fully implemented and the outcome of grammaticalization is quite often a ragged and incomplete subsystem that is not evidently moving in some direction." Variationists (Torres Ca-

coullos, 2011; Poplack, 2011) have shown that variability is characteristic of all stages of grammaticalization and that, when examined from a quantitative perspective, the ragged subsystem acknowledged by Hopper and Traugott clearly emerges.

A typical development for a present perfect form which is evidenced in several languages such as French and Spanish (e.g. Bybee, Perkins and Pagliuca, 1994; Schwenter, 1994) is a shift from a resultative-like construction, to a more general anterior and then finally to a perfective meaning often times replacing the preterite (or unmarked past form) completely, as in most varieties of spoken Modern French (Acadian French, discussed below, is exceptional in this regard). Hegenvald (1989; 2011) characterizes the present perfect's development as a shift from a marker of aspect to a marker of tense.

The general cross-linguistic evolution of the present perfect from a resultative construction to a perfective has been deconstructed into 4 stages by Bybee, Perkins and Pagliuca (1994), Schwenter (1994), Squartini & Bertinetto (2000) and summarized in Copple (2011). The first stage is the formation of the resultative from the HAVE + Past Participle construction. The second stage represents the expansion of the resultative form into anterior contexts—durative and iterative events. The following stage, where the perfect completes the process of becoming a true *perfect*, occurs when the present perfect attains a reading of current relevance. The next stage represents the shift from anterior (which can overlap with speech time) to a preterite meaning where the perfect form can refer to events wholly contained in the past.

Abraham and Conradie (2000) label the grammaticalization of the present perfect into a preterite, *Präteritumschwund*. The present perfect has completely replaced the preterite form in spoken varieties of Northern French, Southern German, Northern Italian, Czech, Slovak, Slovenian and Northern Serbian and Croatian (Ternes, 1988:340). Drinka (2004) argues that the diachronic evidence suggests that this change was at least partially contact induced and part of a broader areal pattern of perfect development in European languages (cf. Sapp, 2008; see also Poplack and Levey, 2010 for a broader variationist critique of claims of contact induced change). *Präteritumschwund*, as we see in section 3.3.1, may be in progress for some varieties of English (e.g. Ritz & Engel,

2008;Ritz, 2010). Finally, in some varieties of English there are claims that the preterite itself is replacing the present perfect (Bryan, 1936;Vanneck, 1958).

For several Romance languages we have a number of variationist studies of historical and modern dialects that are examined with a view to exploring how a grammaticalization path might be evidenced in a fine grained quantitative manner.

The present perfect form in Spanish, as in (37), is thought to be undergoing the transition to a perfective in several dialects. Schwenter & Torres Cacoulllos (2008) examine both Peninsular Spanish⁴ and Mexican Spanish where the present perfect is thought to behave differently in each.

- (37) ayer **he comprado** un aire acondicionado y me da calor (BCON014B)⁵
 ‘yesterday I **bought** an air conditioner and I’m getting heat (from it)’

The present perfect form has not entirely and completely replaced the Spanish preterite in either variety of Spanish. It seems to be at different stages of grammaticalization in both varieties and the grammaticalization is claimed to be more advanced in Peninsular Spanish than Mexican Spanish. Schwenter and Torres Cacoulllos examine all preterite forms and present perfect forms for their data. In Peninsular Spanish, the present perfect form is more likely to occur with proximate events (especially those that occur with some adverb indicating hodiernality (i.e. the event happened today)) and with frequency adverbs and plurals (both of which are concomitant with experiential readings)⁶. In Mexican Spanish the major difference from Peninsular Spanish is the reversal of effect for hodiernal adverbs where *Today* (in some form) only occurs with 10% present perfect forms in Mexican Spanish (n=140), but with 96% present perfect forms in Peninsular Spanish (n=287).

The present perfect form in French has advanced further and has completely replaced the

⁴They take Peninsular Spanish as a monolithic whole. Other sociolinguistic work (for other linguistic forms) has focused on the dialect regions within Spain (e.g. Hernández-Campoy & Villena-Ponsoda, 2009).

⁵These examples come from Schwenter and Torres Cacoulllos (2008) with their corpora references.

⁶There is another context, what they label *irrelevant temporal reference* which they operationalize by assessing if the speaker can ask >cuándo? (when?), where the present perfect form is more likely than the preterite.

preterite in most spoken varieties of French (Meillet, 1912:150) and even in those varieties with the preterite form in use, the preterite still occurs with low frequency. An exception to this low frequency is found in the study of Acadian French by Comeau, King and Butler (2012).⁷ It is clear, however, from the case studies discussed above that the grammaticalization of perfectives from erstwhile present perfects interacts with type of adverbial specification. In Schwenter and Torres Cacoullos' study of Spanish, there are a set of definite past adverbs that become likely to occur with the present perfect as it becomes more perfective. What is understudied in the previous literature, however, is the relationship between adverbs that convey present perfect meaning, not just definite past adverbs, and the present perfect form itself.

Finally, if we compare the present perfect in modern (Standard) English with its analogues in other Germanic languages (Harbert, 2007:312-315; Boogaart, 1999:156), we see that the present perfect in English has not advanced as far along the cline of grammaticalization⁸. This is illustrated in the reported grammaticality of (40) versus (41).

(40) I have gone to see the Lion King.

(41) *I have gone last week to see the Lion King.

German and Dutch admit more perfective uses of the present perfect form as seen in (42) and (43) from Harbert (2007:312) and Boogaart (1999:156). A further difference is that the BE auxiliary is

⁷In their data (ibid: 329), they find the preterite accounts for 20%(N=2998) of the past temporal reference forms they examined. The preterite form is illustrated in (38) and the present perfect form is in (39) from their corpus (ibid: 319).

(38) Je lui parlais un élan, là.
I to-him speak-PST a while there
'I spoke to him for a while.' (Hector, GC-25)

(39) J' ai point parlé trop longtemps.
I have NEG spoke too long
'I didn't speak too long.' (Hector, GC-25)

Their general results for Acadian French was that the present perfect form (versus the preterite) is used more in non-narrative contexts, with adverbial specification, and with non-punctual verbs. Moreover, the present perfect form was strongly favored in contexts with definite time specification indicating even though the present perfect has not completely replaced the preterite in Acadian French, it has acquired the properties of a perfective while retaining some present perfect features.

⁸As discussed in section 3.3.1, there is evidence that this claim does not hold cross-dialectally.

productive in German for the present perfect construction seen in (42).

- (42) Ich bin gestern gekommen.
I am yesterday come.
'I came yesterday.'

- (43) Ik heb gisteren een brief geschreven.
I have yesterday a letter written.
'I wrote a letter yesterday.'

The present perfect form in German has advanced further even into imperfective uses as in (44) from Boogart (1999:155).

- (44) Sie hat gearbeitet, als ich anrief.
She has worked, when I called.
'She was working when I called.'

In German even though this construction is attested in imperfective contexts, it is reported that the present perfect form in German still is preferred in 'presently relevant' contexts (Harbert, 2007:315) as in (45) from Hendricks (1981:37).

- (45) Sie hat schon oft angerufen.
She has already often called.
'She has often called already.'

The modern use of the present perfect in other Germanic languages can inform our study by demonstrating the possibilities of grammaticalization of the present perfect in typologically close languages.

3.3.1 Cross-Dialectal Variation in English

The grammaticalization of the present perfect in Modern English is generally considered to be at an early stage (Harbert, 2007; Bybee, Perkins and Pagliuca, 1994). Yet, several studies presented below indicate that the present perfect could be developing perfective-like uses in certain varieties of English.

(46) The trained station has burned to the ground!

For Modern English, Schwenter (1994) examines the hot news perfect within a descriptive framework relying on data from a variety of spoken (but sometimes formal) sources. His primary thesis is that the hot-news perfects, such as (46), represent a shift from the main readings of the present perfect toward a definite past reading. Refining his hypothesis further, he argues that the present perfect is first used in hodiernal (i.e. same day) contexts before it evolves a perfective meaning. Schwenter (ibid:1023) hypothesizes that as the present perfect advances to a perfective it will initially collocate with indefinite temporal adverbs (such as *previously* or *formally*, but expand into more definite adverbial usage (such as *this morning* or perhaps *an hour ago*). Broadly, he claims that the 'hot-news' perfect functions as a bridging context between the anterior use of the present perfect and the perfective use. His prediction for hodiernal contexts is confirmed by Spanish data (see Schwenter & Torres Cacoullos 2008).

If we consider the present perfect in different varieties of English for the present perfect, we also find even more advanced perfective uses than those reported by Schwenter. Levey (2006) conducts a variationist study of tense variation in 56 narratives produced by 28 British children 7 to 11 years old. He finds that the present perfect form (versus preterite and historical present) in complicating action clauses serves as an episodic marker where the children were more likely to keep using the present perfect in serial procession when describing the same episode in a narrative as in (47). Levey (ibid: 148) interprets this quantitative effect as pragmatic rather than a shift in meaning for the present perfect in British English. The serial use of the present perfect in these complicating action clauses, however, does represent a place where the present perfect as a present anterior would not be expected to occur as in (47). Given the age of these children, it is not clear if this is not due to the children still acquiring and fine-tuning the use of the present perfect form – an interpretation suggested by Gathercole's (1986) study of Scottish children that places the age of acquisition of full use of the present perfect at around 10 years old.

(47) We were in the boot, we were in the boot and then she looked in and we gone, "Paul!"

I <unclear> shoved him. I've **gone** like that <PERFORMED ACTION> and then he's **gone**, "What?" and I said "Look out the window." and then we jumped out the boot and she's **caught** us. (Levey, 2006: 141, Ex 13)

Ritz and Engel (2008) and Ritz (2010) discuss similar narrative uses of the present perfect in Australian English. Ritz and Engel (2008) use a corpus of radio-chat shows and news reports while Ritz (2010) uses a corpus of police media reports published online (both from Australian English speakers). In Ritz (2010), a number of uses of the present perfect form are noted that indicate advanced grammaticalization of the present perfect, such as its occurrence with past time adverbs, as in (49), with sequences of past events, as in (48) and (50), and with events occurring simultaneously as preterites, as in (48).

(48) The victim in this case is a 15-year-old Wattleup boy who was on his way to school[....]. As he reached the the steps leading to the shops he **has been tapped** on the shoulder. As he **has turned around**, a young man **has punched** him to the face and a wrestle/fight **has taken** place during which the victim **has dropped** his wallet. The offender **has grabbed** the wallet and run off, removing his money and dropping the wallet as he ran. (Ritz and Engel, 2008:147, Ex. 16(a)).

(49) ...after a spiteful game between the two clubs on Sunday, the Lions **have lodged** an official complaint with the league yesterday. (Ritz and Engel, 2008:149, Ex. 19)

(50) Speight gunmen **have** already **murdered** an unarmed policeman during a rampage through Suva last month. (Ritz and Engel, 2008:149, Ex. 20)

In fact these uses represent 51% of the total present perfects (n=218) for her data. Ritz's analysis is conducted in a framework of explaining the data within the 'Extended-Now' semantic theory of the present perfect, but it is compatible with the idea that the present perfect form in her data is closer to a definite past use than a present anterior use.

A possible weakness of these studies is that what might be motivating the more perfective use of the present perfect form is genre, as Ritz (2010) herself mentions, and further studies of vernacular speech incorporating apparent and real-time components are needed to pursue the inference of change. Ritz's (and Engel's) work can be buttressed, however, with the results from Levey (2006) in that Levey's major finding for the present perfect in the speech of British children seems to replicate for their work. All three studies find that the present perfect form is being used to mark a sequence of events where the semantics associated with the present perfect form's *present anterior* status should prevent this. It is not clear, however, that these reflect a change in progress in either of these varieties. In Ritz and Engel's work, the data used are from a narrow genre of media speech which may not fully reflect the present perfect's use in Australian English. In Levey's work, the data come only from children and do not eliminate the possibility that the children's use of the present perfect reflects a developmental phenomenon. A criticism that can be made of all of the above studies is that they infer change from synchronic data rather than explore diachronic data.

There is considerable variation cross-linguistically in the grammaticalization of the present perfect and there is indication that past temporal reference forms have not grammaticalized in the same manner for different varieties of English (Harris, 1984). There are examples of divergent grammaticalization in Hiberno-English and African American English. For Hiberno-English, Harris (1984) finds two productive forms that have the same function as the present perfect in Standard English: the after-perfect in (51) and the SVOV construction in (52). As Harris discusses, it is not possible to map the meanings of the present perfect form for standard English to one of the two forms in Hiberno-English.

- (51) A young man's only after getting shot out there. (Std Eng: A young man has just got shot...) Harris (1984:308).
- (52) She's nearly her course finished. (Std Eng: She has nearly finished her course) Harris (1984: 307).

Another example of the divergent paths of grammaticalization in the realm of the perfect has been seen in children speakers of African American English. The past perfect seems to have encroached on uses of the preterite, particularly in narratives. Rickford & Th  berge Rafal (1996) and Ross, Oetting & Stapleton (2004) find a number of examples of the past perfect form used with a preterite interpretation as in (53) and (54).

- (53) I was riding home from school, and on my way home I was, when I was up in the driveway, a car **had** backed up and it ran over my bike and I tried to run. (Rickford & Th  berge Rafal, 1996: 230).
- (54) My mama, she was about to go to Bible study, and on the way back there, her car **had stopped**. And then she **had called** the house because somebody let her use the phone. (Ross, Oetting & Stapleton, 2004:167).

The preterite, past perfect and present perfect forms have not grammaticalized in the same manner across different varieties of English and, in some varieties, there are other competing forms.

3.4 Adverbs and the Present Perfect

In this section, I return to a major focus of this dissertation and discuss claims about the diachronic relationship between the present perfect and adverbial specification. This section summarizes the literature on those issues. While there are a number of different adverbial types in English, I define a narrow set of adverbs on which this dissertation focuses. I am concerned with adverbs that reinforce or create a present perfect reading rather than degree or manner (e.g. *quickly*, *terribly*, etc.) or locative adverbs (*In London*). Adverbs that occur with a resultative reading as in (55), a experiential reading as in (56) or a continuative reading as in (57) are the focus of our work here. The question of whether they create the actual meaning or merely reinforce the meaning embodied or encoded by the form itself affects not only variationist methodology in the study of the present perfect, but more broadly our understanding of what the present perfect actually does,

- (55) but I am very much unfurnished of all necessaries- which I am very loath to importune yow for in regard I **have** allreadie **beene** very chargeable unto yow. [Mod. English: but I am very much unfurnished of all necessities which I am very loath to importune you for in regard I **have** already **been** very chargeable to you.](PCEEC/BARRING/146.098.1663)
- (56) I **have been** often at Sprowston.(PCEEC/BROWNE/159.028.548)
- (57) Wee heare no other newes but that of certaine the French fleete and army inthem are at sea and **have beene** thease six daies and are bound for Mantua.[Mod. Eng: We hear no other news but that of certain the French fleet and army in them are at sea and **have been** these six days.] (PCEEC/BARRING/131.083.1473)

Trnka (1930: 26) notes that adverbial support in older Englishes with the present perfect occurs to indicate the “duration and repetition of the action, or pointing out a definite point in the past from which the action the has continued till the present moment.” Under Tnka’s analysis, the adverbial support is optional. In contrast, Bauer (1970) and Crystal (1966) claim that the continuative reading of the present perfect must have overt adverbial modification and, yet, this is contradicted by the data from both modern American and British English in Schlüter (2000) where the continuative present perfect occurs with a lack of overt adverbial modification in a large minority of his data’s present perfect forms. McCoard (1978: 241) notes that the relationship between tense⁹ and adverbs has changed over time, but discusses modern use of the preterite with adverbs that are supposed to indicate present perfect function (e.g. now, already, etc.). It is possible that Bauer and Crystal’s claims reflect earlier English when the continuative function was established and we address these claims in chapter 5.

Data from Roy and Drinka (2007) demonstrate the variation and development in adverbs and the present perfect across several centuries through translations of Boethius’s *Consolatio Philosophia*¹⁰. The choices of translations in each period, from the examples we see in Table

⁹McCoard’s use of ‘tense’ subsumes the present perfect form

¹⁰The focus of this paper is Chaucer’s possible authorship of a disputed Late Middle English manuscript, but this data is pertinent to the research question here

Boethius c.525	Chaucer c.1380	Colville 1556	Elizabeth I 1593	Graham 1695	Literal Modern English
quae demon- stauimus	that I have schewed	that I haue shewed	that we have shewed you	which I have shewed <u>already</u>	which we have demon- strated.
ostensum est	thow hast schewyd me <u>wel</u>	thou hast shewed	that thou hast showed <u>sufficiently</u>	thou hast <u>already</u> shewed me	it has been shown
Iam dudum uehementer exspecto	I have abyden <u>longe tyme</u> to herkne it	I greatly loked for nowe of late.	That is hit...I haue <u>long</u> lookt for	That I in- deed expect with much Impatience.	For a long time, I wait impatiently
ostendisse suffecerit	it suffiseth that I have shewed	it suffiseth that I haue shewed	hit suffiseth to shewe	Let it suffice that I have <u>hitherto</u> de- scribed	it suffices to have shown

Table 10: The Present Perfect in Boethius Translations

10, indicate that for even the same source clause across historical varieties of English, the presence or absence of adverbial modification can vary. There are a number of interesting variations that can be noticed by examining these translations of the same source text diachronically.

For each present perfect that occurs with an adverb (underlined) in Table 10 none are consistently adverbially marked in all translations. Interestingly, the adverb and even the overt present perfect form surfaces differently across many of the translations above. Further, while such alternation is possible for the four clauses above, it is not clear whether or not this alternation is available to other readings of the present perfect and what linguistically motivates or constrains the variability. The translations of *ostensum est* not only vary in the presence or absence of adverbs, but also in the lexical adverbs used—*wel*, *sufficiently*, *already*. Importantly, these adverbs also are not historically related lexically (e.g. *wel* was not the Middle English precursor to *sufficiently* or *already*).

There is also another kind of variation that applies to this study evidenced in Table 10, the tense alternation. This is most clearly seen in the translations for *Iam dudum uehementer exspecto* where *exspecto* alternatively takes the present perfect form, the preterite form and the simple present

across the translations. Identifying which preterite (or even simple present) forms are interchangeable with the present perfect form, as discussed at great length in the previous chapter, is not a simple task, without the extra support that these translations of the same exact source material provide. These same translations, however, illustrate the robust historical variation in our linguistic variable that is circumscribed fully in the next chapter.

3.5 Summary

There are a number of important facts established in this chapter that provide the foundation of the data and methodology discussed in the next chapter and as well as the analysis of the data in subsequent chapters. First, while there is disagreement over whether or not the present perfect had all of its readings available in Old English or by the end of Middle English, the present perfect has acquired its full range of use, uncontroversially, by Early Modern English. Second, each stage of development of the present perfect correlates with the acceptance of different types of adverbial modification and their frequency both cross-linguistically and in varieties of English. Third, while there have been a number of broad statements made historically about the relationship between adverbial modification and the present perfect and we can even find diachronic evidence of this variability, there are no studies of this particular variability or its possible linguistic explanations.

Chapter 4

Data and Method

4.1 Introduction

This chapter describes the data used in this thesis and the methodology applied to the data. The historical and modern data sources are described in detail in Section 4.2. Section 4.3 describes the context of variability studied in this work and explores the motivations for focusing on the target variable. Section 4.4 presents each of the linguistic contexts that are hypothesized to condition the variability apparent in the data. A comprehensive discussion of the competing statistical models and their results for this study can be found in Chapter 5.

4.2 Data

These data sources are used to explore how the relationship between the present perfect and adverbial specification is constrained in modern Canadian English as well as precursor varieties of the language.

4.2.1 Canadian English

The Canadian English data on which this study is based are drawn from the Quebec English Corpus, housed in the Sociolinguistics Laboratory at the University of Ottawa. The Quebec English Corpus was originally constructed to address issues related to contact-induced change by systematically comparing English spoken in three urban centres differentiated by the proportion of mother-tongue claimants. Quebec City and Montreal were selected as urban centres where English is a minority language in intense contact with French. Oshawa-Whitby, situated in the predominantly anglophone region in the Greater Toronto Area, was selected as a control variety, representing urban mainstream Canadian English spoken as a majority language (see Poplack, Walker & Malcomson 2006 for further details). As the focus of the present study is on English in its majority guise, the data are drawn exclusively from the Oshawa-Whitby sub-component of the Quebec English Corpus, which has 19 speakers with speaker characteristics as displayed in Table 11 (reproduced from Poplack, Walker & Malcomson, 2006:189):

Age	Male	Female	Total
18-24	2	5	7
25-30	2	1	3
31-35	0	0	0
50-64	1	0	1
65-74	4	2	6
75+	1	1	2
Total	10	9	19

Table 11: Canadian English Distribution of Speakers

- (1) Uh- when she 's **had** enough.(QEC/311/25)
- (2) How long would it have been since you've **seen** her? (QEC/314/587)

In (1) and (2) we see examples of the present perfect form from our data (the variable context is discussed in detail in Section 4.3).

4.2.2 Early Modern English Data

In order to explore the diachronic development of the variable, comparable historical data must be utilized. For English, the present perfect is claimed to have evolved its present range of readings during the Early Modern English period between the 15th to 17th centuries (Elsness, 1997; Rissanen, 1999; McFadden and Alexiadou, 2010). The Corpus of Early Modern English Correspondence (CEEC) (Nevalainen, Raumolin-Brunberg, Keröänen, Nevala, Nurmi and Palander-Collin, 2006¹) provides data that allow us to examine the relationship between the present perfect form and overt adverbial modification during this period. The entire CEEC consists of 4970 letters written from approximately 1410 to 1695.

Any variationist study of a pre-modern language variety provokes a set of methodological questions about the source of data used. Sociolinguistic interviews provide the predominant source of data for most variationist studies of modern spoken language (Milroy & Gordon, 2006:57-68) though there are some exceptions. There are two questions that need to be addressed with regard to any pre-modern source of data: how speech-like is the source of data and how reliable is the data's attributed provenance (i.e. specifically its attributed author and date)? In assessing the questions, I choose the Corpus of Early English Correspondence (Taylor, et. al, 2003) and in particular letters between family members, for reasons I present below.

A first and important problem that a variationist faces when confronting historical questions is what source of data would be most appropriate and comparable to modern data generated during sociolinguistic interviews. Sociolinguists only have access to voice recordings from the end of the 19th century and beginning of the 20th century (e.g. Bailey, Maynor and Cukor-Avila, 1991; Poplack and St-Amand, 2007). If variationists want to examine linguistic variation prior to the 19th century, they must use some kind of written source. The seminal work of Romaine (1982) addresses the problem of written versus spoken language for socio-historical linguistics. The em-

¹Parsed Corpus of Early English Correspondence, text version. 2006. Compiled by Terttu Nevalainen, Helena Raumolin-Brunberg, Jukka Keröänen, Minna Nevala, Arja Nurmi and Minna Palander-Collin, with additional annotation by Ann Taylor. Helsinki: University of Helsinki and York: University of York. Distributed through the Oxford Text Archive.

phasis and focus on actual speech in variationist studies has two sources, the linguistic origins of variationist methodology and the major focus on non-standard varieties. Variationist methodology was originally developed in relation to the study of phonological variation (Labov, 1966) and originated with non-standard dialects which were more readily available to study in spoken form (Labov, 1966; Wolfram, 1969; Fasold, 1972). In order to study pre-modern language within a variationist framework we need written data that is itself closer to the unmonitored speech central to Labovian sociolinguistics.

Speech does not exist, however, in a dichotomous relationship with writing. It is a speaker's unmonitored and unselfconscious speech (termed *vernacular* by variationists) that produces both the linguistic variation and conditioning central to sociolinguistics. Therefore, historical sociolinguists need written data that reflects unplanned and hopefully, unmonitored production of linguistic forms in order to draw comparisons with modern speech data. Tannen (1982) posits the existence of an oral-literate continuum with more speech-like genres (e.g. casual conversation) positioned at one of the continuum, and prototypical written genres (e.g. expository prose), characterized by syntactic and lexical complexity, positioned at the other end of the continuum. Elspass (2012) formalizes this continuum with the work of Koch & Oesterreicher (1985, 1994) and extends it into two components which retain the importance of the orality and writing distinction, but allow for important overlap²: language of immediacy and language of distance. Elspass's discussion centres on private letters in socio-historical linguistic studies and thus, is pertinent to our work here. The language of immediacy in his analysis is comprised of orality, informality and unplannedness. Literateness, formality and plannedness constitute its opposite, the language of distance. Elspass argues that private letters (and specifically the Corpus of English Correspondence) reflect features that are closer to the three features of the language of immediacy (i.e. more oral). Literacy rates reported by Nevalainen and Raumolin-Brunberg (2005:42) for the start of the Early Modern English period were 10% for men and 1% for women. This increases to 40% for men and 25% for women by 1700. The letters reflect varying degrees of literacy of the authors for this period.

²There is writing (e.g. television scripts) that are meant to reflect orality and speech (e.g. closing arguments in a court case) that is meant to reflect properties of writing).

Admittedly, regardless of the amount of orality, informality and unpreparedness, there are still some non-standard forms that are not evidenced in writing even by letter writers who are semi-literate (e.g. *ain't* in van Herk, 2008). Furthermore, during the historical period under consideration here, efforts to standardize the written language were relatively incipient (Milroy, 2000:15-18). The fact that the heyday of prescriptive grammar postdates the historical period under consideration in this dissertation (1400-1700) means that the normative conventions associated with the ideology of a codified standard language had not yet taken root and were unlikely during this period to have blocked many of the variants now considered non-standard in the written language. The linguistic variable targeted in this dissertation, detailed in section 6.1, occurs robustly both in the synchronic and diachronic corpora.

The issue of authenticity is presented in Elspass (ibid: 158). Many times letters of appeal or making a formal request would not be written by the same person who signed the letter (and in fact professional writers were hired for such purposes—see Schneider, 2002:76-77). For this reason, letters between non-family members are excluded from the CEEC sample.

The corpus is tagged on multiple levels. Each letter is tagged for the social characteristics (age, gender) of the writer and the recipient as well as relationship between both (Nuclear Family, Other Family, Family Servant, Friend). The historical component was further restricted in this study to letters written between family members, as those letters were more likely to relay narratives and to be personal (or informal). The topics of these letters include not only business dealings, but also the day-to-day happenings and inquires about personal information. For example, the following is the text of a letter from Richard Cely to his brother in 1488 discussing business affairs (the Cely family were merchants). As Bailey, Maynor & Cukor-Avila (1989:287) demonstrate, this family's letters represent important data from an “emerging mainstream vernacular” in Early Modern English rather than just one British regional dialect. The broader corpus (of which Bailey's (et al.) data are a component) also reflects this emergence.

Riught whel belouyd brother , I recwmennd me wnto yow wyth aull my hart , informyng
you that I hawhe resawyd ij lettys frome John Dawlton , thay bothe drecttyd to yow
, wherby

(3) I undyrstond he desyrys to hawhe bohwt for hym iij +geardys of blake pewyke,

and I hawhe pwrwhayd hyt for hym , byt I can gehyt no caryayge tyll Robard Heryke cwm at styr .

Syr , thys day I spake wyth Bryan and he says at that ys not the

(4) bastard swherd at he howlde hauhe , hyt ys yowr gylte swherd.

And my Loord Schambyrlen pwrpos to be at Calles befor Ester, and thys day I departe into Cottysowldewhard be the grase of Jhesu kepe yow, and send ws goode tydyngys frome yow.

Whryt at London the 21 day of Marche . per yowr brother , Rychard Cely.

Modern English Orthography: Right well beloved brother, I recommend me unto you with all my heart, informing you that I have received 2 letters from John Dalton, they both (are) directed to you, **whereby I understood he desires to have bought for him three gourds of black puke** and I have purchased it for him, but I can get no carriage till Robert Herk come at stir. Sir, this day, I spoke with Bryan and he says as that is not the bastard sword he would have, it is your gilded sword.

Writ at london the 21 day of March, per your brother, Richard Cely.

In the above letter, reproduced in whole from the CEEC, we see several examples of the content of the discussions that these letters contain. Spelling was not standardized at this time. The closest to a standard that was developed was the practice print shops had developed for internal use and it is not uncommon to see the same word spelled differently by the same author in one letter (Scragg 1974). In (3) above, a request for 'blake pewyke' or black puke (a type of alcoholic beverage) is made. The letter, though short, indicates the informality that these letters could have with the request for the desired malt and sword. Bastard, as in the 'bastard sword' in (4) (corrupt in some way), at the time the letter was written would have been a vulgar expression (Hughes, 2006:18-19).

The following is another letter from John Holles to his wife, Ann, written in 1627:

[SALUTATION]:To his Lady the Countess of Clare at Haughton 19 May 1627.
To my very loving wyfe the Countess of Clare, Sweet hart what my sunn Wentworth will do in this loane, I would gladly know the voyce is heer. he will lend, unwilling to be separated from his young wyfe, and young sunn, and having an infirme boddy, agreeing better with ease, and content, then with payne.

he writt to Mr. Ratcliff, who hath been in the Marshallsea this fortnett to conferr with me what he should do uppon the cumming down of the letters for his answer,

wheruppon I writt to him, it were better for him to cum up, then to give a negative in the cuntry; and so prevent sending for: by this I advysed him not to refuse, but in case he refused, to give suche answer heer, rather, then to stay there the fetching up by a Pursivant.

Peradventure he is advysed by sum hence, to delay his cumming, that in the mean time the Duke gone, the wynd may alter, for no wyse man will gallopp to a bad bargayn if this will serve the turne; I shall be glad but the Dukes going is so ofte putt of, as it is believed, it may be putt of altogether; munday next in the holydays, was the day, since, the thursday following, now, not this fortnett, and peradventure not at all, could he leape from his othes often made for his going.

Yesterday Sir Roger Townsend married my Cosen Mary Vere, he had no mony, only sum land assured in reversion.

- (5) Morgan is the most taedious taylor, I know he hath had the boys sute to make every since it came up, which I gladly would have sent you by the carrier and he sends me word it will not be done till the next week.
- (6) Jack tells me he will send for horses to bring him down, for my Lord Vere goes over within this fortnett, but my Lady, and my daughter stay till the great belly be discharged, which God grant may be to our cumforts. Jhon Coswarth hath brought his wyfe to this town and cums to yow into the cuntry. he asked me leave to keepe his footman, which I granted him.

My caws for Elseley is heard the 5 June, which past, heer I stay not. My Lady Vere and my daughter stay till shee be brought to bed, my Lord Vere goes over within this fortnett.

I forgott I had writt this before. I hope yow shall receave by the carier Foster nayls suche as yow writt for, they cost 1=s= 6=d= the hundred. I say I hope so, for Tom Osbaston hath not yet brought them. Yow shall heer more from me by Charls, who came this morning hither from my sunn Wentworth.

[VALEDICTION]The Lord of heaven grant yow health and all cumfort. Amen. Hatton hows, this 19 of May. Your most loving husband Clare.

In this letter, a series of events are relayed by Holles to his wife. In (5), he discusses a suit he is having made and the delays with the tailor. In (6), switching topics, he relays information about when his son, Jack, will be travelling. In terms of their content, these letters reveal many details about the writers' daily lives and personal preoccupations. In spite of the highly formalized salutation and valediction in each letter (excluded from analysis), the content of the letters is relatively informal and, as such, does not constitute an official or formal register.

As mentioned previously, we only select those letters which are between nuclear family members and this yields 95 authors (and 255 letters). This leaves us with following letters (by author) in Table 12 for the 15th century, Table 13 for the 16th century and Table 14 for the 17th century.

Author	Number of Letters
Margaret Paston[N.Mautby]	15
Richard Cely Jr	5
John Paston III	9
John Paston II	8
Richard Cely Sr	2
George Cely	3
John Paston I	2
Elizabeth Stonor[N.Croke]	3
William Paston Iii	3
Richard Calle	1
Agnes Paston[N.Berry]	3
Edmond Paston II	2
William Paston II	3
Clement Paston I	1
Robert Cely	1
Margery Paston[N.Brews]	1
Thomas Stonor III	1
Anny Wydeslade N. Stonor	1
Edmond Paston I	1
William Stonor	1
All 20 Authors	66

Table 12: Data from 15th Century

Author	Number of Letters
Edward Bacon	10
Nathaniel Bacon I	7
Nicholas Bacon I	4
Thomas More	2
Elizabeth D'Oyly N. Neville	4
Francis Hastings	2
Anne Bacon[N.Gresham]	2
Henry Clifford III	1
Alice Alington	1
Mary Tudor	1
Thomas Clifford	2
Henry Tudor VII	1
Robenett[Robert] Plumpton	1
Margaret Stuart[N.Tudor]	1
Thomas Wyatt Sr	1
Isabel Plumpton	1
William Plumpton Ii	1
Elizabeth Tudor	1
Nicholas Bacon II	1
Henry Tudor VIII	1
Anthony Bacon	1
Mary Tudor I	1
Catherine Parr	1
Agnes Plumpton	1
Margaret Roper[N.More]	1
All 25 Authors	50

Table 13: Data from 16th Century

Author	Number of Letters	Author	Number of Letters
Dorothy Osborne (Temple)	4	Brilliana Harley	6
Thomas Knyvett	12	Katherine Paston	7
John Holles, Sr.	7	Anne Conway	5
Thomas Brown, Sr.	6	Charles Stuart II	6
Paulina Jackson	2	Charles Hatton	6
Isaac Basire, Jr.	1	Arthur Capel	2
Samuel Pepys	2	James Oxinden	5
Thomas Wentworth	2	John Barrington	3
Nicholas Ferrar	2	Dorothy Browne	2
Francis Hatton	1	Thomas Meautys	4
John Pepys, Sr.	1	Frances Basire	4
Christopher Hatton IV	1	Frederick Corwallis	4
Adam Oxinden	1	William Wentworth II	1
Edward Conway, Jr.	1	Henry Fleming	2
Anna Collet	1	John Hoskyns I	4
Richard Oxinden, Jr.	1	Richard Haddock	2
Mary Peyton	1	Elizabeth Masham	2
William Temple	1	Robert Barrington	3
Daniel Fleming	1	John Ferrar, Sr.	2
William Howard	1	Henry Oxinden	2
Elizabeth Smyth	1	John Finch	2
Anne Howard	1	Charles Stuart I	2
Katherine Oxinden	1	Thomas Barrington	2
Arabella Stuart	1	Thomas Stockwell	1
Nathaniel Bacon II	5	Thomas Howard III	2
All 50 Authors	139		

Table 14: Data from 17th Century

4.3 Adverbs with the Present Perfect

Recall from chapters 2 and 3, there are two competing theories of the meaning of the present perfect. The first theory attributes a set of defined functions to the present perfect form itself while the second theory attributes a broad indefinite past temporal reference meaning to the present perfect that is filled in via adverbial, contextual and pragmatic information. Both theories have informed different variationist studies of present perfect meaning as some variationists examine the present perfect form within a context of present perfect functions (e.g. Winford, 1993; Tagliamonte, 1997) while others examine the present perfect form within the context of past temporal reference (e.g.

Van Herk, 2008, 2010). This thesis focuses on the present perfect form in English and whether adverbs that occur with the present perfect are independent from the meaning of the present perfect or if the present perfect form and adverbs interact to produce the meaning attributed to the present perfect form. The first subsection below describes the variable context fully used in this work while the second subsection addresses possible variationist critiques of such an approach.

4.3.1 The Variable Context

The present perfect form can surface with and without adverbial specification. The adverbial specification that we are focused on here modifies some part of the temporal structure of the predicate – we are concerned with adverbs that potentially reinforce present perfect meaning. Adverbs that are locational, for example, are not part of the variable context.

- (7) Also thy broder Rycharde hath be at zorke and at Laysetter. [ModEng: Also, thy brother Richard hath be at York and Leicester.] (PASTON/306.101.3024)

In (8) below, the present perfect itself is bold and the adverbial support underlined and italicized. The variant is represented between brackets at the beginning of each token with $\emptyset$ representing the non-application value for a variationist analysis with each token with an underlined and italicized adverb representing the application value (i.e. overt adverbial modification).

We begin by extracting all present perfect forms. Each present perfect (Have/Has + Past Participle) is included as a separate token. The tokens in (8)-(11) represent overt adverbial modification of the present perfect form. The adverbial modification surfaces in different syntactic positions: in (10) and (11) the adverb surfaces inside TP (between the auxiliary and participle), in (8) the adverb surfaces adjoined to the VP, in (9) the adverb is a clausal adjunct. Lack of modification only has one syntactic structure (i.e. there is no adverb) and is illustrated in (12)-(14).

- (8) I've **been** out to the bars once there. (QEC/304/601)

- (9) I **have spoken** it since I was grade-one, so, it was six years I 've **been** speaking French.

(QEC/301/2094)

(10) Should I see the doctor and tell him or not, I 've already **booked** with the thing. (QEC/306/1466)

(11) I don't think I 've ever **taught** a saxophone lesson. (QEC/308/198)

(12) [Ø]Jennifer's in-laws have a cottage in Haliburton, we 've **cottaged** there with them.
(QEC/311/1125)

(13) [Ø] Oh I 'm done- I 've **done** all the concept paper. (QEC/315/648)

(14) [Ø] We have been on- we **have crossed** the Channel with Missy's parents. (QEC/311/1187)

The presence or absence of adverbial support meets the traditional definition of a linguistic variable (Labov, 1972), where not only the tokens which include an overt adverb are included, but the tokens of present perfect forms where an adverb could occur but does not are also included. Statives and irrealis uses of the present perfect are excluded as they are not performing one of the present perfect functions discussed above. Each of the functions of the present perfect discussed above interacts with adverbs.

All tokens from our data in Section 2 are extracted. We exclude modal constructions as in (15) and (16) as the modal use of the present perfect does not reflect, necessarily, one of the three readings.

(15) [1] Oh right, of-course. Mhm-hmm. [311] Might **have heard** of Cayuga-Speedway?
(QEC/311/128)

(16) she must **have had** influence on it at some point. [1] Mhm-hmm. (QEC/311/591)

We also exclude non-present perfect stative possessives as in (17) which do not have the same function as present perfect stative possessives as in (18). The first example forms part of the stative possessive context that varies with the present form of HAVE and with GOT alone (e.g. Taglia-

monte, D'Arcy and Jankowski, 2010) and the second is a true present perfect form ³

(17) They **haven't** even **got** any pieces left. (QEC/319/102)

(18) Karen's never **had** a pet except for a horse. (QEC/315/1084)

4.3.2 The Broader Context of Past Temporal Reference

Other researchers might examine the above variable context and argue that there are other non-present perfect forms that convey the same meaning. The purpose of this work, however, is not to examine all forms that instantiate a present perfect function, a controversial proposition as seen in the previous literature on the topic discussed in chapter 2, but to examine what contribution to a present perfect reading that the present perfect form itself makes and what contribution that the adverbial support makes to the meaning. If the present perfect form itself encodes part or all of the present perfect meaning, then that will have consequences for how the present perfect function is studied in relation to other verbs forms. It would substantiate the assumption that all present perfect forms are part of the variable context in some variationist studies (e.g. Tagliamonte, 1997, 2013; Davydova, 2011). If, however, certain readings of the present perfect strongly favor or categorically require adverbial support, then it might be that different readings of the present perfect represent orthogonal linguistic variables with differing sets of linguistic constraints and competing variants. Moreover, if the appearance of adverbial support itself is linguistically constrained, this also has an effect on how the boundaries of the variable context of the present perfect function are drawn. As discussed in chapter 2, in order for non-present perfects forms (i.e. the preterite) to surface with a present perfect meaning in use, adverbial support is used to fill in the gap between the default non-perfect reading of the form and the present perfect reading. It becomes nearly impossible without adverbial support, as illustrated in Chapter 2, to identify preterite (or other) forms that overlap in meaning with the present perfect without the analyst trying to reconstruct the psycho-

³The question of the relationship between the present perfect form (have had) and the present possessive (have) and got-possessive forms (have got, got) is interesting, but beyond the scope of this thesis. There are no claims that I have found that HAVE HAD is anything but a true present perfect form.

logical motivations of the speaker – a process that variationists usually advocate against (Sankoff, 1989; Schwenter & Torres Cacoullos, 2008). Furthermore, if there is linguistically constrained variability in the appearance of adverbs and the present perfect form, then that same possible variability must be accounted for when using adverbs as evidence of present perfect meaning with non-present perfect forms.

4.4 Linguistic Contexts that Influence the Appearance of Adverbs

If we return to our original research question about the present perfect, we want to determine if there is a core meaning that surfaces in the present perfect form or whether there is simply a broad indefinite meaning that is refined through adverbial support. If there is a core meaning present in the form itself, we would expect some linguistic contexts to not require temporal adverbial support in order to achieve that meaning. Conversely, if there is ambiguity between readings imposed by the linguistic context, we would expect more overt adverbial specification in ambiguous contexts than unambiguous ones. If overt adverbial modification is simply an independent reinforcement of what the present perfect means, we would expect ambiguity to increase the likelihood of overt adverbial modification while non-ambiguous contexts are neutral or less likely to have overt adverbial modification. Further, we do not expect this same core reading to obtain throughout our diachronic data. For each of the time periods, we can test this same broad hypothesis. A possible criticism of such an approach could rely on Tagliamonte (1999: 212-213) which finds that in her data adverbs are counter-functional (i.e. they appear more in contexts where there is an overt marker of tense and aspect) and suggests that adverbs for her data do not disambiguate meaning, but reinforce it. The methodology imposed here tests that hypothesis directly and, as seen in the next chapter, generates different results for each time period. We include not only factors that operationalize the conditioning on the appearance of overt adverbial modification (e.g. Present Perfect Reading and Lexical Aspect), but also those broader factors that are thought to produce the present

perfect form itself (e.g. Negation, Clause Type, Grammatical Subject, Sentence Type and Voice). If adverbial modification is simply a reinforcement of the core meaning of the present perfect, we would expect more adverbs either in places where the present perfect itself is reported to be more likely from the previous literature or where the linguistic context is reported to be ambiguous. Both would provide evidence of the independence of the present perfect form and adverbial modification. If, however, the reverse happens, then we have evidence of what Tagliamonte has labelled the *counter-functional* use of adverbs and demonstrating that adverbs cannot be used as independent verification of present perfect meaning.

4.4.1 Present Perfect Reading

As presented in chapter 2, each of the three main readings (resultative, experiential, continuative) of the present perfect can occur with or without adverbial modification. Identifying the category of reading for produced tokens, however, can be problematic.

Van Herk (2008: 58) claims that most readings are not directly available to the analyst: “*Type of PP (resultative, continuative, experiential) appears to be assigned based on the interaction of adverbials, verb semantics and form choice and is thus not directly available (Zydattiss, 1978)*” Yet, Tagliamonte (1997;2013) and Davydova (2011) use these three functions as the basis of their analysis of the present perfect. Davydova (ibid: 124), in particular, employs an algorithmic approach to the categorization of ‘type’ that is replicated and adapted in our work here (with the terminology described in chapter 3). The questions below, in the order displayed, are asked of each token until a ‘Yes’ is obtained with the appropriate classification.

1. Does the clause (with the present perfect) describe a state that is indicated to still obtain at speech time? [Yes: Continuative]
2. Does the event indicate a change of state at speech time? [Yes: Resultative]
3. Can the event repeat? [Yes: Experiential]
4. No to all of the above: Ambiguous.

We include an ambiguous category and we do not consider 'recency' as a separate reading (unlike Davydova's original approach). The inclusion of an ambiguous category allows us to address van Herk's concern about the identifiability of this factor in all tokens while also allowing us to test whether adverbial support is used mainly to disambiguate readings of the present perfect. Each category is illustrated below.

In (19) and (20) we have examples of continuatives (2 separate ones in (20)).

- (19) Youre son John Paston the yonger I hope shal be wyth you thys wyke- and enforme you of mo thyngys- and howe myn hors and hys sadell and harnys ys prysoner at Coshay halle- and **haue ben** euer syn Wensday last (PCEEC/PASTON/307.102.3048).

Modern English Orthography: Your son John Paston the younger I hope shall be with you this week and inform you of more things and how mine horse and his saddle and harness is prisoner at Coshay hall and **have been** ever since Wednesday last.

- (20) I **have spoken** it since I was grade-one, so, it was six years I **'ve been** speaking French.(QEC/301/2094)

In (21) and (22) we have examples of resultatives.

- (21) They're completely comfortable with that. And we **have added** French to our environment. We play games in French.(QEC/311/946)
- (22) And my mom'd be like, "Okay, stop." like, we **'ve heard** that one. So, I don't know. I don't know. (QEC/301/956)

In (23) and (24) we have examples of the experiential meaning.

- (23) Uhm, yeah. Vacations, lyke we **'ve been** to Florida four or five times. (QEC/302/224)
- (24) And sur- you schall undyrstond that I **have be** with my Lady of Southfolke as on Thursday last was- and wayted uppon hyr to my lady the Kynges Modyr and hyrse-be hyr commaundment.(Stonor/14.049.824)

Modern English Orthography: And sure, you shall understand that I **have be** with my Lady of Suffolk as on Thursday last was- and waited upon her to my lady the King's Mother and hers-by her commandment.

In terms of its historical development, Slobin (1994) claims that the resultative meaning associated with the present perfect was the first to emerge, followed by the experiential meaning, and, later, the continuative meaning. As a later development (and by extension, a less grammaticalized function of the PP), we would hypothesize that the continuative uses of the perfect would be more favourable to adverbial support in comparison to other uses of the perfect. Further, continuatives are claimed to either require or at least strongly favor adverbial support (Crystal, 1966; Bauer, 1970; Schluter, 2001).

4.4.2 Lexical Aspect

As presented in chapter 2, lexical aspect could be predicted to effect overt adverbial modification. There are three privative features that comprise Olsen's (1997) taxonomy of lexical aspect applied here: Telicity, Dynamicity and Durativity. In practice these represent three separate factor groups.

As defined in chapter 2, [+Telic] events are those that contain an inherent end-state as in (4) and (5).

- (25) He **hath ben arestyed** sythyn +tat +ge went. (Paston/222.060.1624)

Modern English Orthography: He has been arrested since that he went.

- (26) We have been on- we **have crossed** the Channel with Missy's parents. (QEC/311/1187)

[+Dynamic] events are those that indicate an event of change (or movement) as in (6) and (7) versus states as in (29).

- (27) I **'ve made** some significant changes in my life (QEC/313/1342)

(28) And we **have added** French to our environment. (QEC/311/946)

(29) We're going to put a pool in our backyard. We **'ve loved** camping. We camped with the children. (QEC/311/752)

[+Durative] predicates are those that occur over an interval of time such as (30) and (8), versus punctual events which are instantaneous or near-instantaneous as in (32).

(30) He says, "No." He says- he says, "**I've watched** you,"(QEC/318/587)

(31) I said that to so many people that- that **I've worked with**, and that have worked with me.(QEC/317/726).

(32) Much of ye money they **have received** hath been by collectors of their owne. (Essex/88.019.528).

Modern English Orthography: Much of ye money they **have received** hath been by collectors of their own.

These combine to produce the traditional Vendlerian classes in Table 22, reproduced from chapter 2.

Class	Telic	Dynamic	Durative
States			+
Activities		+	+
Accomplishments	+	+	+
Achievements	+	+	
Semelfactives		+	
Stage-level state	+		+

Table 15: Vendlerian Lexical Aspect from Olsen (1997)

Olsen (1997:176) states that [+dynamic] verbs produce an existential reading, but those without this feature (i.e. achievements) are ambiguous between existential and continuative readings and those without the [+Telic] feature can be continuative or resultative. The [+Durative] feature is not thought to distinguish possible readings. These claims tie into the broader research question on

adverbs and present perfect meaning in that if adverbs serve to reinforce present perfect meaning, we could expect that the different classes which are ambivalent between two readings to require (or favor) the appearance of adverbs to disambiguate the produced meaning.

If overt adverbial modification functions as a reinforcement of present perfect meaning, then we can predict the following effects for the linguistic context of lexical aspect:

- +Dynamic predicates should have a neutral or disfavoring effect on the production of overt adverbial modification for the present perfect form.
- +Telic predicates should be likely to have overt adverbial modification.
- +Durative predicates should be the most likely to have overt adverbial modification.

Each component is coded as separate factors in order to best operationalize the claims made about lexical aspect. Thus, lexical aspect is operationalized as three separate binary factors:

- Telic versus Atelic
- Dynamic versus Stative
- Durative versus Punctual

4.4.3 Negation

Negation is thought to interact with aspect via a process of atelization (Schwenter and Torres Cacullos, 2008: 19) and thus generate a continuous meaning without adverbial support (Squartini and Bertinetto, 2000:412). An event that has not occurred in the past, likely still has not occurred in the present. Thus, we would expect those sentences that surface with 'not' to be less likely to need adverbial reinforcement in order to achieve a perfect reading. Elsness (1997) observes in his data that the present perfect is more likely in negative contexts for British and American English post-1750, but does not find an effect pre-1750. We coded the data for negation as in (33), and a positive sentence in (34).

- (33) there **have not been** many **issues** raised in this federal election.(QEC/311/1297)
- (34) I haue sent for mr Birch who **haue bine** heer ever since thursday last. (Paston/100.079.1666)
 Modern English Orthography: I have sent for Mr. Birch who **have been** here ever since
 Thursday last.

4.4.4 Clause Type

There are several types of clauses that are thought to influence the production of the present perfect itself. Main clauses, as in (9), have a neutral effect with respect to the production of present perfect forms (Elsness, 1997). Givón (1983) observes that restrictive relative clauses, as in (10), can encode background information about the discourse (see Fox and Thompson, 1990 for empirical verification for English, cf. Gibson, et. al 2005) and are thus more likely to have a present perfect form.

When, after and before clauses, as in (37), are thought to join events together and thus they should not be conducive to the present perfect form itself (van Herk, 2008; Elsness, 1997). *SINCE*, as in (38) follows a separate set of development according to Elsness (1997), and are kept separate from the other temporal subordinate clauses.

- (35) My fellow watchers **have bin** a sleep too till just now. (PCEEC/OSBORNE/37.017.777)
 My fellow watchers **have been** asleep too till just now.
- (36) I think that's also the way I've **been brought up**.(QEC/301/2290)
- (37) Uh- when she 's **had** enough.(QEC/311/25)
- (38) How long would it have been since you've **seen** her? (QEC/314/587)

4.4.5 Grammatical Subject

Elsness (1997) notes that with 1st and 2nd person subjects, as in (39) and (40) respectively, the present perfect is more likely than with 3rd person and NP subjects, as in (41) and (42) respectively.

(39) He says, “No.” He says- he says, “I **’ve watched** you.” (QEC/318/587)

(40) ...that you **’ve built** a relationship enough with them.(QEC/313592)

(41) Brian learned about whales, I’m thinking of what he’s **learned**. (QEC/311/1345)

(42) His sister his wyf is hear- whose convenience **hath kepp** me hear all this summer. Modern English Orthography: His sister, his wife is here- whose convenience **hath kept** me here all this summer-(PCEEC/HOLLES/518.136.3806)

4.4.6 Sentence Type

In Elsness’s (1997) study, the structure of a sentence affects the appearance of the present perfect form across all time periods in English. Transitive (SVO) sentences, as in (43), are more likely to have the present perfect form than intransitives with a complement (SVC) as in (44) and both of these types are less likely than intransitives without a complement (SV) as in (45).

(43) I **’ve created** this product.(QEC/315/727)

(44) He **hath byen** at Sent Benettys and at Norwyche- (PCEEC/PASTON/31.008.136)
Modern English Orthography: He **hath been** at Saint Bennett’s and at Norwich.

(45) and have left mee much more at liberty then I **have bin** of late- (PCEEC/OSBORNE/167.069.3914)
Modern English Orthography: and have left me much more at liberty than I **have been** of late.

4.4.7 Voice

One effect reported by Elsness (1997) is that active clauses as in (46) were more likely than passive clauses as in (47) to have present perfect forms.

(46) It's the same- nothing's **changed**.(QEC/314/493)

(47) You-know, do you really live in an ice house? I've **been asked** that. (QEC/311/1274)

4.4.8 Overt Adverbial Modification and Meaning

This subsection summarizes all of the contexts above that create ambiguous readings of the present perfect. If the present perfect form conveys an internal meaning itself, we would expect overt adverbial modification in these ambiguous contexts. We would also expect, if there are readings that are not part of core reading of the present perfect, that overt adverbial specification would be more likely for those functions than in functions that do not reflect the core meaning conveyed by the present perfect form itself. Moreover, we have two sets of predictions about our variable context: The first makes direct hypotheses about the relationship between overt adverbial modification and the present perfect; the second makes indirect predictions on likely places for the present perfect itself to occur and we can infer less likely for overt adverbial modification if modification reinforces the meaning.

1. HYPOTHESES

- Continuative clauses are more likely than Experiential to have overt adverbial modification.
- Experiential clauses are more likely than Resultative to have overt adverbial modification.
- +Dynamic predicates should have a neutral or disfavoring effect on the production of overt adverbial modification for the present perfect form.
- +Telic predicates should be likely to have overt adverbial modification.

- +Durative predicates should be the most likely to have overt adverbial modification.
- Positive clauses are more likely to have overt adverbial modification.
- 3rd Person and NP clauses are more likely to have overt adverbial modification.
- Passive sentences are more likely to have overt adverbial modification.

4.5 Summary

The two sources of data allow us to situate the linguistic variable we discussed in this chapter from the period of stabilization of the present perfect as a perfect form through to a modern variety of Canadian English. The variable context allows us to examine not only the changes which occurred with the present perfect itself for our data, but how those changes might manifest themselves with the reinforcement of overt adverbial modification. It is not only the overall occurrence of overt adverbial modification, however, that could provide the most useful information to our investigation, but how that support surfaces within different linguistic contexts.

Chapter 5

Results and Discussion

5.1 Introduction

This chapter provides the results of our investigation with an overview and discussion of the different statistical models proposed for the analysis of quantitative data in sociolinguistics. First, an overview of the distributional rates are presented for our data by factor group. Second, using the traditional sociolinguistic tool of GOLDVARB, the results of the multiple regression analysis are presented providing estimates for the effect of each factor group while controlling for other factors groups. This is followed by a discussion of newer statistical models that have been proposed for quantitative analysis in sociolinguistics. Finally, the contribution of the results to addressing the research questions is evaluated.

Over the last decade a debate has been taking place in sociolinguistics about the appropriate statistical models to analyze data. This debate is often framed as GOLDVARB versus more modern statistical programs. In particular, modern logistic regression and a logistic mixed-effects model with speakers as a random effect have been proposed as alternatives to GOLDVARB (Saito, 1999; Johnson, 2009). The criticism of GOLDVARB (and its VARBRUL predecessors) has focused on the differences between these three models in the analysis of social factors (sex, age, etc.). What is not clear from these criticisms, however, are the putative advantages associated with newer models

in terms of analyzing the linguistic conditioning of variability. This chapter provides a summary of the history of statistical models in variationist sociolinguistics as well as an overview of newer models that have been proposed. This chapter will demonstrate that some of the benefits of the traditional model (via GOLDVARB) used in sociolinguistics have been ignored by proponents of more modern techniques and/or programs. Further, many of the newer models also have limitations that are widely recognized in much of the statistical literature but are seemingly ignored or sidestepped in recent critiques of the models generated by Goldvarb. Such limitations, if not sufficiently acknowledged, could produce spurious or misleading results. The use of newer models in the analysis of linguistic variation is not wholly without merit as demonstrated via tests that are not available with GOLDVARB but provided by modern implementations of logistic regression.

We have the opportunity in our data to examine the outcomes of different statistical models: our research question is focused on the linguistic system that constrains the co-occurrence of adverbials with the present perfect form. We have to rely on the statistical model to produce some of this evidence and thus, we have an opportunity to compare the traditional statistical approach with newer models that have been advocated elsewhere (e.g. Johnson, 2009; Drager & Hay, 2012) where the research focus is on the conditioning of social effects and not the linguistic GRAMMAR. Our study allows us to demonstrate differences between these models when the focus is on the probabilistic conditioning, the linguistic GRAMMAR, rather than social factors in the analysis. The purpose of the methodological component of the second half of the chapter is to lay out in as clear as manner as possible some of the underlying assumptions of these newer models/programs and contrast them with those underlying Goldvarb. For each of the two newer models (GLM Logistic Regression and Logistic Mixed Effects Models) an overview of not only the technical assumptions, but how these assumptions manifest themselves in a statistical analysis is presented. Warnings from the literature about the limitations of logistic mixed effects models are analysed in the context of not only our data, but the broader sociolinguistic literature.

5.2 Distributional Results

This section discusses the results for our data in Early Modern English and 20th Century Canadian English and the overall frequency of adverbial modification in each linguistic context set out in chapter 4. The results are first presented in sections 5.2.1-5.2.7, and then summarized in section 6.4.

5.2.1 Overall Frequency

Modern Canadian English

Variant	%	N
Adverb	45.4	296
None	54.6	356
Total	100	652

Table 16: Adverbial Modification in Canadian English.

The results for our variable in Canadian English are in Table 16. The amount of adverbial modification is robust, at 45% for a total of 652 present perfect forms from the 19 speakers from the Oshawa-Whitby component.

Early Modern English

Variant	%	N
Adverb	40.2	253
None	59.8	376
Total	100	629

Table 17: Adverbial Modification in Early Modern English.

Our data for Early Modern English in Table 17 offers a similar rate of adverbial modification at 40% from 629 present perfect forms. Again, we have a robust amount of variation and data for further analysis.

Comparison & Analysis

There is a slight increase between Early Modern English and Canadian English of 5%. While the number of tokens for both Early Modern English and Canadian English are similar (N=629 and 652, respectively), the Canadian English tokens come from the 19 speakers comprising the Oshawa-Whitby portion of the Quebec English Corpus and the Early Modern English tokens come from the 95 authors of 255 letters in our sample from the Corpus of Early English Correspondence.

A small change in the overall rate might mask greater changes in the underlying linguistic constraints (Poplack and Tagliamonte, 2001: 85-92). The next sections that present the distributional analysis context by context demonstrate this quite clearly for adverbial modification.

5.2.2 Present Perfect Reading

We operationalized the readings available to the present perfect according to the three classes detailed in Chapter 4: Resultative, Experiential, Continuative. Tokens with an ambiguous reading are not presented in the distributional analysis or the statistical analyses in the next section (but, these tokens are included in the other factor groups). There are only a small number of such tokens from the Canadian and Early Modern data (N=11 and 29, respectively).

Modern Canadian English

Reading	%	N
Resultative	12.4	218
Experiential	19.1	162
Continuative	91.2	261

Table 18: Rate of Adverbial Modification by Reading in Canadian English

In Table 18, the rate of adverbial modification by present perfect reading is presented. The reading with the most adverbial modification is the continuatives with a rate of 91%. Experientials have fewer adverbially marked present perfect forms at a rate of 19%. Resultatives have the fewest such tokens with 12% adverbial modification. The greatest difference is between continuatives

and the other two readings as both have more than 70% percent fewer adverbs co-occurring with the present perfect. The difference between the rate for resultatives and experientials, however, is less than 7%.

Early Modern English

Reading	%	N
Resultative	27.4	222
Experiential	16.8	101
Continuative	71.2	285

Table 19: Rate of Adverbial Modification by Reading in Early Modern English

Table 19 depicts the rates from the Early Modern English data by reading. The continuatives, again, have the highest rate of adverbial specification at 71%. Resultatives have a rate of 27% adverbial modification while experientials have the least amount of adverbs with 17%. Continuatives have in excess of twice the rate of adverbial modification in comparison with resultatives and over 4 times the rate of experientials. Experientials occur with around a 10% difference from the rate of adverbs in resultatives.

Comparison & Analysis

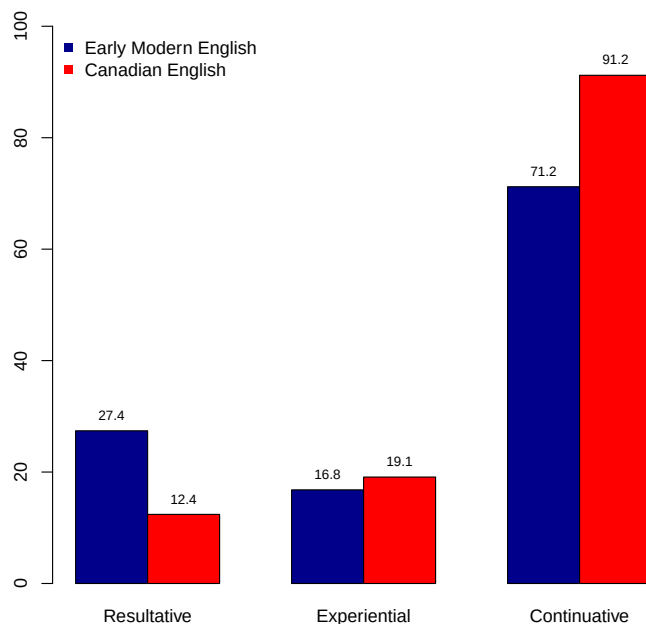


Figure 2: Adverb Modification by Reading

The overall rates of adverbial modification are graphically represented in Figure 2 by data set. There is about a 20% increase in the amount of continuatives that are marked adverbially from Early Modern English to Canadian English. Resultatives decline in adverbial support over the same period with half of the resultative contexts in Canadian English receiving the same amount of adverbial support as in Early Modern English. The ordering of constraints based on the the marginal distribution for reading in the Early Modern English is Continuatives > Resultatives > Experientials. This ordering changes in our Canadian English data to Continutatives > Experientials > Resultatives where experientials show similar rates of adverbial specification between the two data sets with only a 2% difference, but the continuatives' rate increases with a concomitant decrease in the resultatives' rate.

- (1) **Resultative:** And my mom'd be like, "Okay, stop." like, we **'ve heard** that one. So, I don't

- know. I don't know. (QEC/301/956)
- (2) **Experiential:** Uhm, yeah. Vacations, lyke we've **been** to Florida four or five times. (QEC/302/224)
- (3) **Continuative:** I **have spoken** it since I was grade-one, so, it was six years I've **been** speaking French. (QEC/301/2094)

If the rate of overt adverbial specification reflects the historical development of the present perfect form itself, we would expect the same parallel hierarchy as in Slobin (1994) to be evident in both data sets (Continuatives > Experientials > Resultatives). In Early Modern English, the relationship between Resultatives and Experientials is the reverse of the claimed historical development. A tentative explanation is that when the present perfect form shifted from being a purely resultative construction in Middle and Old English, both readings (experiential and resultative) require more adverbial support with the present perfect itself in Early Modern English as the present perfect did not fully encode these meanings at the time.¹ Modern English neutralizes this distinction (shown more clearly with the inferential statistical results in the end of this chapter).

5.2.3 Lexical Aspect

In the analysis of lexical aspect, passive states were excluded from this factor group as the lexical aspect for passive constructions are all stative, and, thus, collinear with the other factor group of voice. The results presented are for active clauses.

¹One could expect that the constraint hierarchy follows the historical development of the present perfect (i.e. Continuative > Experiential > Resultative) for Early Modern English. There is no apparent explanation for the constraint hierarchy (Resultative > Experiential) for adverbial marking of the present perfect form in our Early Modern English data, but a study of the variable for Middle and Old English might provide an explanation.

Modern Canadian English

Lexical Aspect	%	N
States	59	244
Stage Level States	47	36
Activities	42	136
Accomplishments	38	131
Achievements	20	64

Table 20: Rate of Adverbial Modification by Lexical Aspect in Canadian English

The rates of adverb modification by lexical aspect appear in Table 20 for Canadian English. States have the highest rate of adverbial modification, at 59% followed by stage-level states at 47%. Activities and accomplishments had 42% and 38% adverbial modification, respectively. Achievements had the least amount of adverbial specification at 20%. We do not see as much variation in lexical aspect as we did with the factor group of reading, with the difference between the largest and lowest rate at 39%.

Early Modern English

Lexical Aspect	%	N
States	40	532
Stage-Level States	62	56
Activities	14	14
Accomplishments	39	13
Achievements	7	14

Table 21: Rate of Adverbial Modification by Lexical Aspect in Early Modern English

For Early Modern English, Table 21 represents our results by lexical aspect. Stage-level states have the largest rate of adverbial modification at 62% with states and accomplishments at 40% and 39% respectively. Activities occur with a low rate of 14% and achievements have the lowest rate at 7%. It is important to notice the number of tokens in each context as well. While states and stage-level states have the highest number of tokens at N=56 and N=532, respectively, the other three contexts

Class	Telic	Dynamic	Durative
States			+
Activities		+	+
Accomplishments	+	+	+
Achievements	+	+	
Stage-level state	-		+

Table 22: Vendlerian Lexical Aspect from Olsen (1997)

have 13 or 14 tokens each. While the overall rates may seem different, caution, however, should be applied in the interpretation of these differences as Achievements, Accomplishments and Activities all have less than 15 tokens. One token, either adverbially marked or not, could greatly change the overall rate. The low number of tokens, however, in these contexts could be indicative of part of the historical development of the present perfect itself, as discussed in 5.2.3.

Comparison & Analysis

Statives (i.e. states and stage-level states) represent the highest rate of adverbial modification in both sets of data, while punctual predicates (i.e. achievements) represent the lowest amount of adverbial modification in both time periods. Activities and accomplishments reverse their distributional order from the Early Modern English data to Canadian English.

Recall the decomposition of lexical aspect presented in Chapters 2 and 4, in Table 22 with examples of each feature below: +Telic predicates in examples (4) and (5); +Dynamic predicates in (6) and (7); +Durative in example (8).

- (4) He **hath ben arestyed** sythyn +tat +ge went. (Paston/222.060.1624)

ModEng: He has been arrested since that he went.

- (5) We have been on- we **have crossed** the Channel with Missy's parents. (QEC/311/1187)

- (6) I **'ve made** some significant changes in my life (QEC/313/1342)

- (7) And we **have added** French to our environment. (QEC/311/946)

- (8) I said that to so many people that- that I've **worked with**, and that have worked with me.(QEC/317/726).

Olsen had hypothesized several 'ambiguous' contexts where a particular feature of lexical aspect produces two possible readings of the present perfect. If adverbial modification has an effect of disambiguating possibly ambiguous contexts, we would expect the distributional results to fall in line with these hypotheses. The first hypothesis is evident in the data, achievements (those without the +Durative feature) have the lowest rates of overt adverbial marking. The third hypothesis, that states (those predicates without +Dynamic) should have the highest amount of adverbs, is also present in both time periods. This tentatively suggests that adverbs appear with the present perfect when there is more likely, because of the attendant lexical aspect, to be ambiguity in the interpretation of the present perfect form.

+Dynamic predicates should have a neutral or disfavoring effect on the production of overt adverbial modification for the present perfect form.

+Telic predicates should be likely to have overt adverbial modification.

+Durative predicates should be the most likely to have overt adverbial modification.

The largest difference between the two data sets occurs in activities which has 14% of overt adverbial marking in Early Modern English versus 42% in Canadian English. This could be due to a difference in number of tokens that are activities in each data set (N=14 and N=136, respectively). Further, the low rate of adverbs in those contexts in Early Modern English which have +Telic feature (activities, accomplishments and achievements) could be an indication that the present perfect had not developed in non-stative (+Dynamic) predicates as much as it had in stative ones.

Another possible explanation involves the notion of 'boundedness'. A bounded predicate (Depraetere 1995: 2-3) is one in which the termination of the event is manifest in the utterance. For example, *I build houses* is unbounded because there is no inherent termination to the utterance. The sentence *I build six houses*, however, is bounded because of the termination contained in the

utterance (and culminates at the completed building of the sixth house). While telic events can be bounded or unbounded, stative verbs can only be unbounded. The example above extends to statives and as explained by Filip (2012:740) explicit quantification does not render the predicates bounded (e.g. *I love dogs* and *I love my six dogs* are both unbounded). Further, Filip summarizes previous studies that indicate different markers of grammatical aspect convey boundedness or unboundedness independent of the lexical aspect. For example, the progressive in English conveys an unbounded meaning even with verbs that have a lexical aspect of boundedness (e.g. *I was building six houses* is not bounded). Thus, the higher rate of adverbial marking for states might indicate that the present perfect form itself does not convey a bounded meaning alone and that only after Early Modern English data does the present perfect acquire the ability to transmit a [+bounded] meaning without adverbial support. Michaelis (1996: 132) claims that for Modern English the boundedness of the continuative is conveyed via adverbial support and this seems to be strengthened in our Canadian English data.

5.2.4 Negation

Modern Canadian English

Negation	%	N
Positive	46	611
Negative	44	41

Table 23: Rate of Adverbial Modification by Negation in Canadian English

The effect of negation on adverbial modification in present perfect forms in Canadian English can be seen in Table 23. For positive contexts, we have 46% occurring with adverbial modification, while the rate is only 44% in negative contexts.

Early Modern English

Negation	%	N
Positive	39	600
Negative	76	29

Table 24: Rate of Adverbial Modification by Negation in Early Modern English

In Early Modern English the results of adverbial modification by negation are displayed in Table 24. There is a large gap between adverbial modification in positive and negative contexts with 39% and 76%, respectively. There is a 37 % difference between the two contexts' rates.

Comparison & Analysis

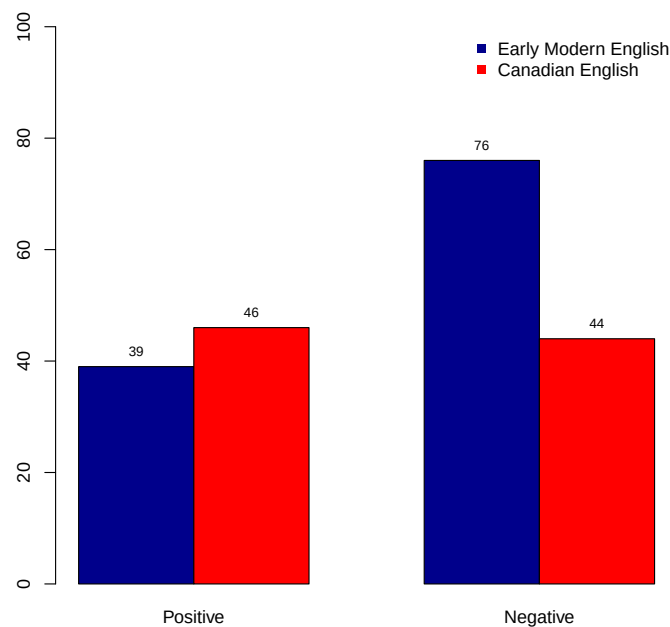


Figure 3: Adverb Modification by Negation

The graph in Figure 3 presents the rates of adverbial modification in both data sets. In Early Modern English negative contexts appear with adverbs much more frequently than positive (with

a 37% difference in rate). This distributional effect reverses in Canadian English where positive contexts appear with more adverbs and only a 2% difference in rate. The difference in Early Modern English seems to be neutralized in Canadian English.

Adverbial support with the present perfect form in negated predicates in Early Modern English might be an epiphenomenon of both the small number of telic predicates discussed in the previous section. The atelicization that is thought to occur with negation (Squartini and Bertinetto, 2000:412) could be counteracted when the predicates are already atelic. Further, the 'double' atelicity in negative contexts could reinforce the need to disambiguate the reading of the present perfect form via adverbial specification. The data validate this reasoning: all negative contexts in Early Modern English are atelic (28 are states, 1 is an activity). Once the present perfect occurs more frequently in telic contexts as in the Canadian English data, the effect reverses.

5.2.5 Clause Type

For clause type, due to the paucity of When-After-Before-Since clauses, these contexts are collapsed with the results for other subordinate clauses.

Modern Canadian English

Clause Type	%	N
Main	49	461
Relative	33	94
Complementizer	39	36
Other Subordinate	39	61

Table 25: Rate of Adverbial Modification by Clause Type in Canadian English

In Canadian English, only 3 When-After-Before clauses appear and only 7 Since clauses (1 overtly marked). The results by clause type are in Table 25. The lowest rate occurs in relative clauses at 33% adverbial modification. The next lower rates occur in complementizer and other subordinate clauses, at 39% each. The highest rate occurs in main clauses at 49%. There is only a 16 % differ-

ence in the range of rates for clause type in Canadian English. The constraint ordering based on the percentages is Main > Complementizer, Other Subordinate > Relative. The types of subordination do not seem as important as the overall distinction between main and subordinate clauses. If the types of subordination are collapsed, the rate of adverbial specification is 36 % (N=191), 13% less than main clauses.

Early Modern English

Clause Type	%	N
Main	42	363
Relative	37	84
Complementizer	27	84
Other Subordinate	46	98

Table 26: Rate of Adverbial Modification by Clause Type in Early Modern English

In Table 26, the results for Early Modern English are presented by clause type. In complement clauses, adverbs occur at a rate of 27%, the lowest for Early Modern English. In relative clauses there is a rate of 37%. Main clauses have 42% adverbial modification rate while the greatest amount occurs in other subordinate clauses at 46%. The difference between the range of rates for this data is 19 %. The constraint ordering for Early Modern English is Other Subordinate > Main > Relative > complement.

Comparison & Analysis

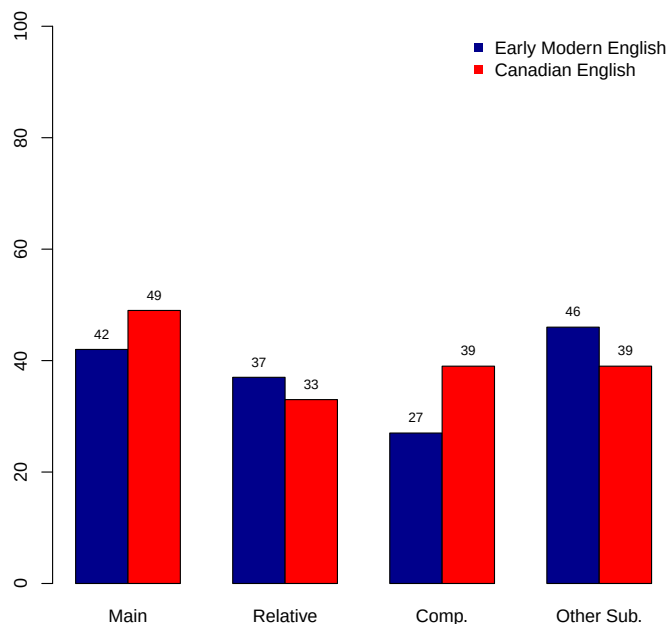


Figure 4: Adverb Modification by Clause Type

The rates for both data sets appear in Figure 4. While the distributional hierarchies for Canadian English and Early Modern English seem very different, the differences between the rates of each context themselves are not very far apart. The greatest difference is in complement clauses which show a 12 % increase between Early Modern English and Canadian English. Each of the other contexts show between a 4% and 6% difference.

There are several types of clauses that are thought to influence the production of the present perfect itself. Main clauses, as in (9), have a neutral effect with respect to the production of present perfect forms (Elsness, 1997). Givón (1983) observes that relative clauses, as in (10), can encode background information about the discourse (Fox and Thompson, 1990²) and are thus more likely to have a present perfect.

²Gibson, et. al 2005 provide evidence that there is a further distinction which should be controlled for: restrictive versus non-restrictive relative clauses. Their work finds that non-restrictive relative clause can encode new information.

- (9) My fellow watchers **have bin** a sleep too till just now. (PCEEC/OSBORNE/37.017.777)
 [ModEng: My fellow watchers **have been** asleep too till just now.]

- (10) I think that's also the way I've **been brought up**.(QEC/301/2290)

5.2.6 Grammatical Subject

Modern Canadian English

Subject	%	N
1st Person Singular	51	280
1st Person Plural	45	109
2nd Person Singular/Plural	11	19
3rd Person Singular/Plural	51	152
NP	28	92

Table 27: Rate of Adverbial Modification by Grammatical Subject in Canadian English

Table 27 shows the rate of adverbial modification by grammatical subject in Canadian English. First person singular and 3rd person subjects tie for the highest rate of adverbs at 51% each. First person plural is the second highest rate at 45 %. There is a decrease from that context in rate to 28% for NP subjects and 11% for 2nd person (only N=19, however). The range of difference in rate is 40%, but when the 2nd person contexts are excluded (due to such a low number of tokens) there is only a 23% difference in rate. The distributional ordering of constraints is 1st Person Singular, 3rd Person > 1st Person Plural > NP > 2nd Person for Canadian English.

Early Modern English

Subject	%	N
1st Person Singular	47	186
1st Person Plural	30	10
2nd Person Singular/Plural	27	30
3rd Person Singular/Plural	44	122
NP	36	281

Table 28: Rate of Adverbial Modification by Grammatical Subject in Early Modern English

Table 28 displays the rate of adverbs by grammatical subject for Early Modern English. First person singular and 3rd person occur with the highest rates of adverbs at 47% and 44%, respectively. NP subjects occur with 36% adverbs while 1st person plural subjects have a 30% rate. The lowest rate of adverbs occur in 2nd person contexts at a rate of 27%. The ordering of constraints for grammatical subject is 1st Person Singular > 3rd Person > NP > 1st Person Plural > 2nd Person for Early Modern English. The difference in the range of rate is 17%.

Comparison & Analysis

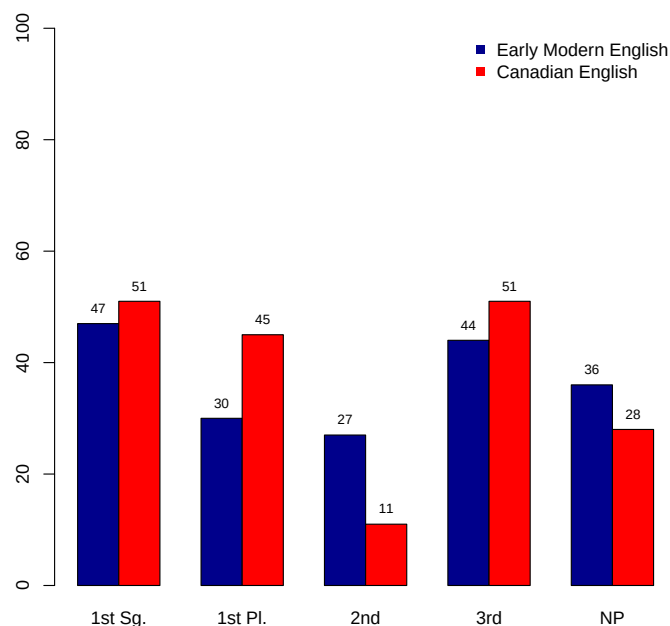


Figure 5: Adverb Modification by Grammatical Subject

The rate of adverbs is displayed by grammatical subject in Figure 5. The largest difference is in 2nd person contexts with a 16 % decrease between Early Modern English and Canadian English. The number of tokens rise from 19 in Early Modern English to 30 in Canadian English and the substantial increase in rate could be a reflection in the low number of tokens in each data set compared to the much larger amount in other subject contexts. 1st person plural contexts show a 15 % increase in rate of adverbial modification. The other contexts demonstrate small difference between data sets of 4-8%. Our results for Early Modern English are in line with Elsness's (1997) claim that the present perfect is more likely with 1st and 2nd person subjects rather than 3rd person and NP subjects. This is neutralized in Canadian English and the primary distinction is between 1st/3rd person pronominal subjects on the one hand and NP subjects on the other, with NP subjects having much less adverbial support.

5.2.7 Voice

Modern Canadian English

Type	%	N
Active	46	618
Passive	38	34

Table 29: Rate of Adverbial Modification by Voice in Canadian English

In Table 29 the results for adverbs by voice are presented for the Canadian English data. Active clauses appear with a higher rate of adverbs than passive ones at 46% versus 38% with an 8% difference.

Early Modern English

Type	%	N
Active	41	476
Passive	39	153

Table 30: Rate of Adverbial Modification by Voice in Early Modern English

In Table 30 the results for adverbs by voice are presented for the Early Modern English data. Active clauses appear with a higher rate of adverbs than passive ones at 41% versus 39% with an 2% difference.

Comparison & Analysis

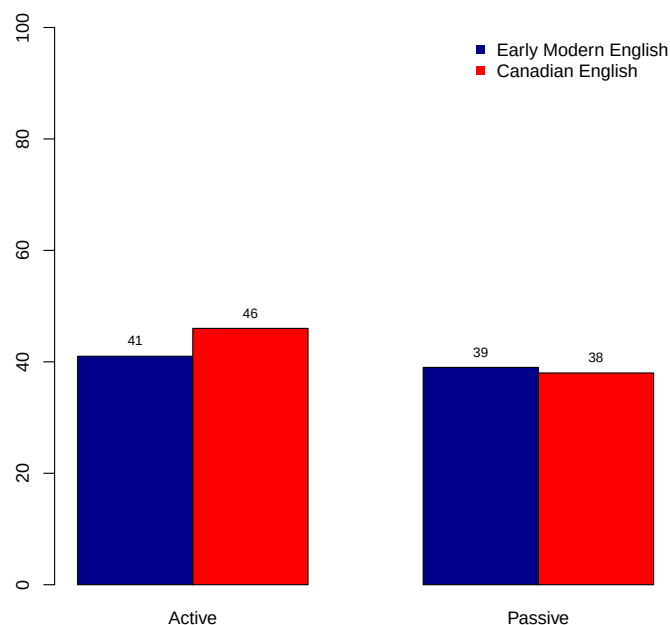


Figure 6: Adverb Modification by Voice

In Figure 6 the results of adverbial modification for both data sets are charted. The ordering is maintained across both data sets, with active contexts more frequently occurring with adverbial support than passive ones. The difference between the range of rates increases 6% from Early Modern English to Canadian English. The stativity of the passive construction may increase the likelihood that the passive present perfect as in (11) more readily encodes present perfect meaning in our Canadian English data without adverbial support.

(11) You-know, do you really live in an ice house? **I've been asked** that. (QEC/311/1274)

5.2.8 Summary

In both data sets the largest difference in rates is the reading of the present perfect; the most frequently occurring context with adverbial support in both data sets are continuatives. The other

two readings show a reversal from Early Modern English to Canadian English. Negative clauses have a strong distributional favoring of adverbs in Early Modern English, but this constraint is neutralized (and even slightly reversed) for the Canadian English data. Lexical aspect shows a strong distributional effect in both data sets with the difference in range for Early Modern English and Canadian English at 37% and 40% respectively. This could be mitigated in the Early Modern English data by the low number of tokens in non-stative contexts. Grammatical subject has a moderate distributional effect with each data set showing a different set of constraint orderings. Clause type displays a similar variability in ordering with a moderate distributional effect in both time periods. This effect becomes stronger in the Canadian English data where main clauses have a higher rate than each type of subordinate clause and the combined subordinate types. The next step in the analysis is to move beyond the the distributional results to ascertain whether the patterns uncovered thus far are statistically significant when they are subject to a multi-factor analysis that is capable of determining the effect of each factor group while simultaneously controlling for the others.

5.3 Sociolinguistic Statistics

The distributional results examined in the previous sections leave a number of questions to be addressed:

- Are some factor groups more important than others?
- Could we expect the same results with a different sample of data?
- What is a factor's effect if we control for the other factor groups?

In order to answer any of these questions we need an added inferential apparatus that produces answers through a replicable and accountable process. Due to the categorical nature of some sociolinguistic data, sociolinguists originally adopted statistical models for contingency tables. Sankoff and Cedergren (1994) and Labov and Sankoff (1979) present the technical and linguistic assumptions underlying the traditional Variable Rules programs that have been used in sociolinguistic analysis since the 1970's.

5.3.1 GOLDVARB X

Under a traditional VRA (produced by VARBRUL family of programs) the model used is as follows:

$$\log \left(\frac{p}{1-p} \right) = m + \sum \text{Factor Effects} \quad (5.1)$$

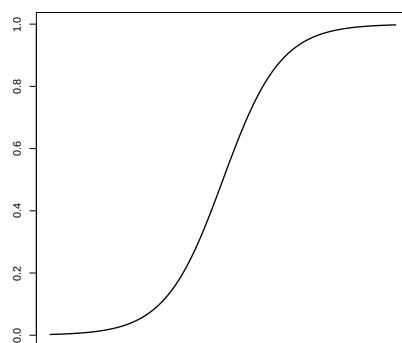


Figure 7: Logistic Curve

Sankoff (1988/2005) presents 5.1, where the p represents the probability of obtaining the application value of our linguistic variable out of the other possibilities (there can be multiple *other* possibilities). In the data for this thesis the application value is the presence of an adverb with a present perfect (versus no adverb, which is the non-application value)³. The m value is usually referred to as the corrected mean and represents the likelihood of the application value when the factor group effects are controlled. The sum of all of the factor group effects completes the equation. The logit portion of the equation, $\log \left(\frac{p}{1-p} \right)$, is necessary because of the curvilinear pattern that proportional dependent variables take. The log transformation translates the curvilinear pat-

³Multinomial regression is an option, if we have a dependent variable composed of more than two categories. This type of regression requires we select a reference value which can be thought of as the inverse of an application value (i.e. the category you don't want to produce estimates for). Although this type of regression appears useful, one critical assumption, INDEPENDENCE OF IRRELEVANT ALTERNATIVES (IIA), requires that adding categories to our dependent variable does not change the odds of selecting an existing category. Without the IIA assumption the mathematical foundation of multinomial regression collapses and the results produced are meaningless. (Hilbe, 2009: Chp 11§2)

tern into a linear pattern and allows for the factor weights to fall between 0 and 1. The logistic curve is in Figure 7.

There are several underlying assumptions that are required to run a Varbrul analysis (e.g. GOLDVARB X) from Sankoff (1988/2005), Cedergren (1973), Cedergren and Sankoff (1974), Guy (1988): (1) The factor groups are orthogonal; each factor group is independent (both in terms of construction and the distribution of the data). (2) The individual tokens are independent of one another. (3) The mathematical relationship between the factor groups and the proportion of the application value is best captured with the logit link. (4) The relationship between the factor weights and the proportion of the application value is linear under the logit link. [That is 7 becomes a straight line when the logit link is applied to the probabilities]

We return to the first two assumptions later when we discuss logistic regression (as a GLM) and mixed-effects models. The third assumption is addressed by Sankoff (2005 : 1155-1156) in a discussion of alternative link functions (i.e. alternatives to the left-hand side of 5.1). For example, we could use $\log(p)$ as the link function or $-\log(1-p)$. The first alternative is more sensitive to changes in probability as the probability approaches 1. This means that under the link of $\log(p)$, you are more likely to detect statistical difference for weaker effects if your data is distributed close to 1 (or 100%). The second alternative link has the same relationship, but on the opposite side of the curve—as p approaches 0 (or 0%)—with a link of $-\log(1-p)$, you have a greater chance of detecting statistical significance for weaker effects if the effects are close to 0. As Sankoff discusses, there is no reason to assume either alternative as we can generate the opposite situation with our data by choosing another application value (if our data are dichotomous). If the application value is greater than 95% or less than 5%, using an alternative program to GOLDVARB X and changing the link function (to one of the ones above) could be more informative. To conclude our discussion of the link function, it seems appropriate to mention that between 30-70% (or .3 and .7) the logistic curve is linear – it is reasonable to approximate logistic regression with linear regression if the application data for cells of your data all fall within this range (ANOVA is appropriate here as well). It is, however, useful, to have one approach to statistical data with data of the same type

(here binary) without having to examine cell distributions.

GOLDVARB X (and previous Varbrul programs) use Iterative Proportional Fitting (IPF) to estimate the factor weights. The IPF algorithm treats the data as a contingency table. While Sankoff (1988: 990/2005:1157), Tagliamonte (2006:133), Johnson (2009: 360) refer to GOLDVARB as a specialized type of logistic regression, my position is that within a modern statistical framework, this is somewhat misleading (especially to statisticians who are not familiar with traditional approaches to categorical data before the early 1980's). There are very real differences in the results produced by Goldvarb from modern logistic regression implementations that sociolinguists should be aware of as they could substantively change the analysis and interpretation of variability for a set of data. Later, we examine the assumptions (and attendant statistical framework) that accompanies logistic regression in the modern sense (and review a more in depth argument about why labelling GOLDVARB as a type of logistic regression is misleading). There are several features of GOLDVARB that are somewhat unique vis-à-vis most statistical programs:

- (R-1)Categorical Requirement: All factor groups must be discrete categories.
- (R-2) Non-singularity Requirement: Any factor level with 100% or 0% of the application value has to be excluded.
- (R-3) Local Slash operator: We can “slash” some tokens to exclude from calculation of one factor group’s effects while the same tokens are included for all the remaining factor groups. [There is also a global slash operator that will exclude a set of tokens from a particular run.]
- (R-4) Uncentred Weights: (By default) factor effects are weighted by the number of tokens in a factor level. Further, within one factor group one factor weight does not influence another.

All of these unique requirements & features of GOLDVARB are direct consequences of the IPF algorithm that is used to calculate factor weights. You do not have (R-1) or the ability for (R-3) in other statistical programs because the algorithm they implement is different. IPF creates a multi-dimensional contingency table of your data based on your factors. Thus, we can tell the

algorithm, via slashing (R-3), to ignore a subset of tokens for each iteration of the algorithm. The uncentred weights produced by GOLDVARB are a result of weighting each factor level by the number of tokens (so a factor level with 10 tokens is not as influential on the final estimates as one with 100 tokens). Goldvarb does not constrain the estimated probabilities in a factor group together. Thus, if context 1, 2 and 3 come from the same factor group, we do not have a stipulation of the relationship between p_{context1} , p_{context2} , p_{context3} . The centred weight ignores the number of tokens in a factor level and constrains the relationship in a way similar to sum contrasts in logistic regression. They can be generated (currently) by selecting “centre weights”.

The range, the difference between the highest and lowest estimated factor effect in a factor group, represents a measure of strength for the overall effect of a factor group. The taxonomy in this thesis used to interpret the range is discussed in Horvath and Horvath (2003:149): <10 is a weak effect; 10-30 is a moderate effect; 30-50 is a strong effect; >50 is a very strong effect. Moreover, the estimated factor weights presented here are interpreted with the following categories and the baseline of .50 indicating a neutral effect: .40-.50 slightly disfavoring (possibly neutral); .50-.60 slightly favoring (possibly neutral); .30-.40 moderate disfavoring; .60-.70 moderate favoring; .10-.30 strongly disfavoring; .70-.90 strongly favoring; below .10 very strongly disfavoring; above .90 very strongly favoring. Both the factor weights and the range provide a window on the underlying grammar (Sankoff and Labov, 1980; Poplack & Tagliamonte, 2001:94; Walker, 2013: 77-92).

Recently, there is some controversy over using the range as a measure of strength. Kapatsinski (2012) reports that the range seems biased for factors with small amounts of tokens. While this is true, as with most statistical measures, more data will produce more accurate estimates, Kapatsinski's suggestion of replacing the range with information criteria may not be best response, as this would still not furnish you with a measure that would be comparable across studies. One extension for the range that would be available with the techniques described in Section 5.4.2 is to generate confidence intervals (or a statistical range of the range) to control for low N's. Such an approach would provide a measure that is still in part comparable to the traditional statistical

model in sociolinguistics.

5.3.2 Modern Canadian English

Before presenting the multiple regression results, the distributional results for both data sets are graphically summarized in in Figures 8& 9.

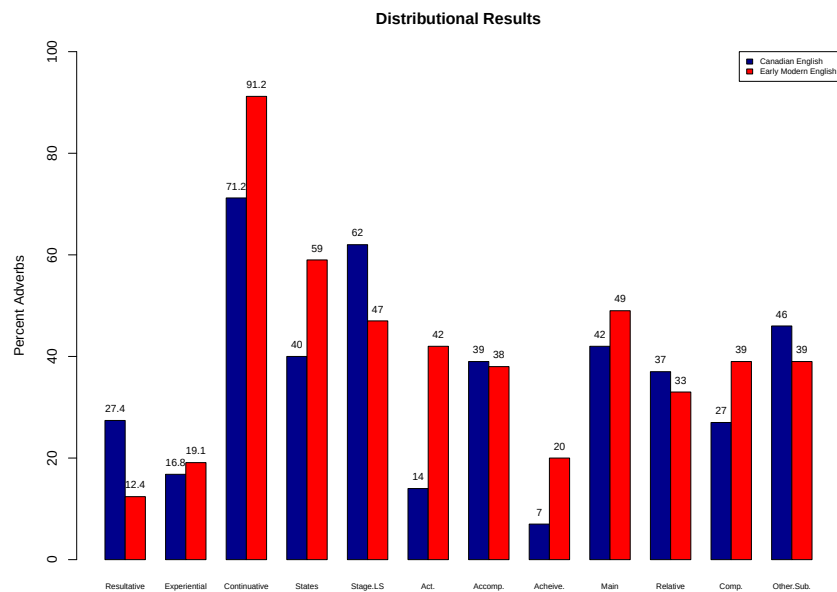


Figure 8: Adverb Modification for Reading, Lexical Aspect and Clause Type

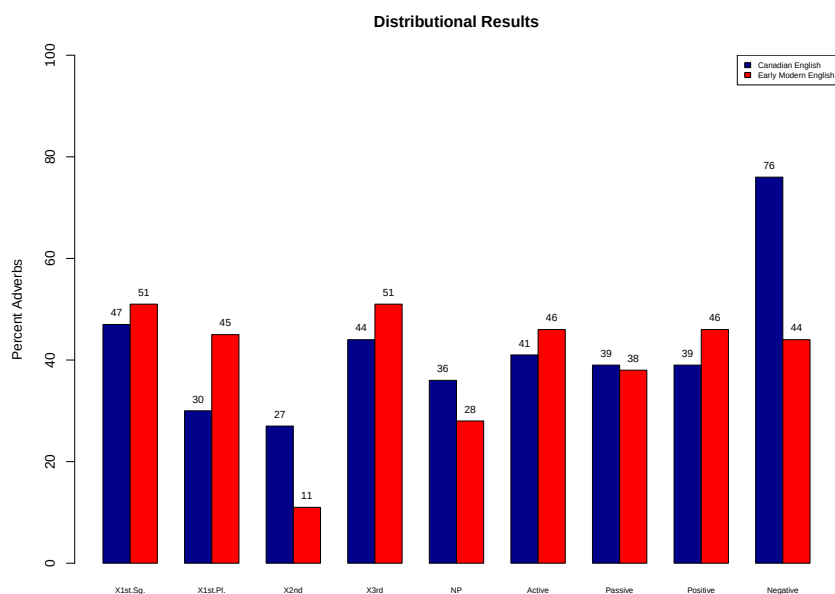


Figure 9: Adverb Modification for Person, Voice and Negation

Group	Factor	Weight	% Adverb	N
	Corrected Mean	0.46	45	652
Present Perfect Reading	Continuative	0.93	91	261
	Experiential	0.17	19	162
	Resultative	0.13	12	218
	RANGE	80		
Grammatical Subject	1st Person Singular	0.61	51	274
	3rd Person	0.44	51	152
	1st Person Plural	0.43	45	108
	NP	0.40	29	90
	2nd Person	0.26	11	17
	RANGE	35		
Negation	Positive	0.52	46	600
	Negative	0.28	44	41
	RANGE	24		
Factors not selected as statistically significant.				
Voice [X]				
Lexical Aspect [X]				
Clause Type [X]				

Table 31: Multi-factor analysis of the linguistic factors contributing to the selection of overt adverbial modification with the present perfect in Canadian English.

Table 31 shows the regression analysis produced by Goldvarb X (Sankoff, Tagliamonte and

Smith, 2005). Lexical Aspect, Clause Type and Voice did not obtain statistical significance in the Canadian English data. The strongest factor group that has a very strong overall effect is the reading (Range = 80) with continuatives strongly favoring the selection of adverbs at .93 and strongly disfavoring experientials and resultatives at .17 and .13. The second strongest factor group that has a strong effect (Range=35) is grammatical subject with a constraint ordering of 1st Person Singular > 3rd Person > 1st Person Plural > NP > 2nd Person. It seems that 2nd Person subjects are driving the significance of this factor group as there are several cross-over effects (where the ordering of distributional constraints does not match the ordering of factor weights). Cross-over effects might be indicative of interaction between the factor groups. The χ^2 -per-cell value for our model in Table 31 is .71 and indicates, however, this is not likely (values greater than 1 indicate over-dispersion and would indicate the possibility of an interaction unaccounted for by the factor groups in our model, see Agresti, 2002: 151-153). The internal ordered constraints (We, 3rd, NP) are all between .40 and .44 indicating that they each have a slightly disfavoring or neutral effect while I moderately favors (.60) the selection of adverbs. Negation has a moderate effect (Range = 24) and negative tokens strongly disfavor with .28 for an estimated factor effect.

5.3.3 Early Modern English

Group	Factor	Goldvarb	% Adverbs	N
	Corrected Mean	0.39	40	629
Reading	Continuative	0.78	71	222
	Resultative	0.36	27	285
	Experiential	0.23	17	101
	RANGE	55		
Negation	Negative	0.71	76	29
	Positive	0.48	39	600
	RANGE	23		
Factors not selected as statistically significant.				
Voice [X]				
Lexical Aspect [X]				
Clause Type [X]				
Grammatical Subject [X]				

Table 32: Multi-factor analysis of the linguistic factors contributing to the selection of overt adverbial modification with the present perfect in Early Modern English

In Table 32, the Goldvarb results are presented for the selection of adverbs in the Early Modern English Data. Again, the factor group of reading has a very strong effect (Range =55) with negation having a moderate effect (Range =23). The estimated constraints orderings have different directions than in Canadian English. Negative tokens are estimated at .71 to strongly favor the selection of adverbs. Experientials and resultatives are both estimated to disfavor adverbs at .23 and .36 each, but there is a larger distance between each weight (Sub-Range = 13) and experientials are less likely than resultatives to have adverbial support, but both factors have a smaller effect than in Canadian English.

In the effect for negation, however, there is an severe unbalance in the data with positive tokens (N=600) accounting for 95.3% of the data and negative tokens (N=29) accounting for less than 5%. Guy (1988) warns that when a factor holds either 95% or less than 5% of the total number of tokens, the statistical model can have difficulty differentiating the factor effect from other overlapping factor groups. The χ^2 -per-cell value for our model in Table 32 is 1.02 and indicates that there is not a problem in fit for the data.

5.4 Modern Logistic Regression

Two models have been proposed in the literature to replace Goldvarb: A Generalized Linear Model - Logistic Regression (GLM-LR) (e.g. Sigley, 2003; Johnson, 2009) and an extension of GLM-LR, a mixed-effects model (e.g. Johnson, 2009; Drager and Hay, 2012). This section provides an extensive overview of both models and concludes with the results for these newer models produced for the data. In Section 5.4.1, a discussion of the term “logistic regression” is presented with analysis of modern statistical terminology. What is lacking in the previous literature that discusses statistics for a sociolinguistic audience is a clear comparison between the assumptions underlying Goldvarb and modern logistic regression as well as the additional parameters that are produced in logistic regression. Sections 5.4.2 to 5.4.5 provide an overview of the assumptions for the two newer models. In section 5.4.2 I discuss how the algorithms that underlie each of the newer models differ from Goldvarb with respect to the estimation of the factor weights. I pursue this further in section 5.4.3, where the term *contrasts* is defined and its importance presented. Section 5.4.4 is a full comparison of Goldvarb and GLM-LR. More recently, some have argued for sociolinguists to use a logistic mixed effects model with speaker as a random effect (Johnson, 2009). Section 5.4.5 describes these mixed-effects models. A discussion of recent work in sociolinguistics that critiques Goldvarb is presented in section 5.4.6. The issue of statistical significance in each of the three models presented here is discussed in Section 5.4.7. An alternative in sociolinguistics to a mixed-effects approach has been to include speakers as a fixed-effect in the analysis. Section 5.4.5 discusses the statistical ramifications of such an approach and why it should be avoided. Finally, 5.4.8 has a comparison of the results for each model on the data.

5.4.1 Background

As mentioned previously, the results provided by the statistical estimation algorithms in Goldvarb are often referred to as a specialized type of logistic regression. Logistic regression, as implemented by most modern statistics programs, is a Generalized Linear Model (GLM), which is a

large class of statistical models and represents an extension of the typical regression (or ANOVA) situation for non-linear data. GLM is a unified approach to several different types of non-normal (non-gaussian) data. The goal is to find some transformation of a dependent variable to make it linear. GLM represents a statistical framework fully described by Nedler and McCollough (1983) developed in the 1970's to unify previous approaches to regression with binary, count and other non-normal data (see Hardin and Hilbe, 2001 for an account of GLM approaches with extensions developed recently). Prior to this point each different type of response variable required a different algorithm to estimate the regression situation. This unification made it more straightforward to implement statistical programs that could handle multiple types of data with one approach.

Most importantly, the assumptions underlying Goldvarb are not the same set of assumption required for the logistic regression that is implemented by most modern statistical programs (R, SAS etc.) which are based on the GLM framework. The underlying logistic regression model presented in 5.2 is similar to what we have seen for Goldvarb. The results produced by most logistic regression program, however, are not in terms of probabilities (the factor weights of Goldvarb), but in terms of log-odds. Thus, each β_i represents the odds of your application value occurring in i linguistic context controlling for all of the other linguistics contexts and the mean (α or the intercept—the log-odds version of the corrected mean.)

$$\log\left(\frac{y}{1-y}\right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i \quad (5.2)$$

The link function, $\log\left(\frac{p}{1-p}\right)$, represents a one-to-one transformation that makes binary data (modelled in terms of p , the probability of the application value) linear. Imrey, Koch, and Stokes (1981) describe the pre-GLM approaches to logistic regression (available at the time the Varbrul series of programs were implemented). Non-normal data impose restrictions on most available statistical models that are not present with normal (gaussian or bell-curved) data. Violations of these assumptions have a much larger effect on the analysis than with standard linear regression or ANOVA techniques. It is important to note that during the 1970's there were three possible approaches that sociolinguistics could have used when developing the initial Goldvarb programs.

The first approach was the precursor to the more modern GLM approach. It estimated the effect of both gradient (or continuous) and categorical factors on a binary dependent variable. The second approach, which underlies most of the Varbrul programs and their current manifestation, GOLD-VARB X, is Iterative Proportional Fitting (IPF) (also called table raking in demography). This approach is based on treating the data as a table of counts (a multi-dimensional contingency table). The third approach is weighted least squares regression to logit transformations of cell counts (and then using modified tests for statistical significance). This approach is implemented in several major statistical software packages, but is not widely used. In the early 1970's when the first Varbrul program was developed, the first approach (similar to modern GLM) was not widely available.

5.4.2 Parameterization of Logistic Regression

In order for GLM-LR to work, for every factor group, we have to define a mathematical relationship between the factor levels in all the factor groups. For each factor group, under GLM-LR, the log-odds are assumed to sum to 0. There are alternative methods to describe the relationship between factor levels, but assuming the log-odds sum to 0 allows us to produce results that are comparable to Goldvarb. This section discusses the mathematical nature of these different approaches to parameterization of the statistical models in preparation for the next section on linear contrasts. Using modern logistic regression, we are able to generate not only a measure of central tendency (i.e. the estimate of factor effect for each group), but standard errors for each factor weight.

There are six assumptions that underlie a GLM framework (see Breslow, 1996 for a more technical overview of the assumptions) which I present here for completeness and explain below.

1. All observations are independent.
2. $V(\mu)$, the variance of the mean, is correctly specified.
3. ϕ is correctly specified ($= 1$ for the binomial model)
4. The link function is appropriately specified.

5. The covariates are in an adequate mathematical form (e.g. Sometimes you need to apply a log transformation to counts to make them linear).
6. There are no outlying observations greatly influencing the model.

The interpretation of condition (a) depends heavily on what meaning you assign the word “independent”. There are a number of mathematical relationships between tokens that violate independence. The technical definition of independence that is meant here is that the probability of all tokens in a sample can be decomposed into the product of individual token probabilities, or formally:

$$\prod_{i=1}^N p(\text{Token}_i) = \sum_{i=1}^N p(\text{Token}_i)$$

An intuitive definition of independence is that if we say a set of tokens from the same speaker are independent from one another, we mean that no (probabilistic) information about any token is contained in the other tokens. Thus, the probabilistic likelihood of any given token is independent of the other tokens and can only be modelled through the factor groups.

The second condition roughly means that there is only one source of noise (or variance) in your model. An alternative to this assumption are random-effects models (discussed later) where each subject (or speaker in the sociolinguistic literature) is treated as a separate effect and all of the subjects share a separate source of noise. Because the GLM framework estimates not only mean effects (i.e. factor weights under the typical sociolinguistic scenario), but also estimates the standard error (variance) of each, this assumption is required. In order to produce standard errors and confidence intervals, assumptions have to be made on the variance for the statistical model. I leave aside the technical variance formulae and refer readers to Hardin and Hilbe (2001) or Breslow (1996) for a comprehensive overview. What should concern researchers the most about this assumption is that the only noise (variance) introduced into the statistical model is done through the measurement of the dependent variable. Thus, if you have reason to believe that there is noise introduced with your individual speakers or that your factor groups are random variables (as opposed to fixed effects) then the estimates from a standard GLM approach will not be appropriate.

The scale parameter, ϕ , is essentially another measure of noise and, for binary data distributed with a binomial distribution (i.e. the situation under logistic regression), the scale parameter is assumed to be equal to 1. This is an assumption made specifically of the data and its behaviour under the statistical model – thus, you can assess this prior to collecting your data (i.e. in the same way we assess independence separately from the data itself as a requirement of the theory we’re using). There are a number of tests of overdispersion (that is the scale parameter $\gg 1$). One such test is produced by Goldvarb (the chi-square per cell value). (see Agresti, 2002: 151-153). Overdispersion is the problem of too much noise in your data. This is commonly due to one of the following reasons (Hardin and Hilbe, 2001: 115; Littell, et al. 2006: 540-541).

- You’ve left out an important factor group.
- Certain observations have too much influence (outliers) (this could be mis-coding of observations or perhaps, a speaker behaving idiosyncratically)
- You have an interaction either in your observations or with the construction of your factor groups.
- if you have a continuous factor (e.g. age, frequency), it may need to be transformed.

These four possibilities have to be assessed by the researcher in light of the data and research question. There is the case, once all of the above possibilities are accounted for (or at least considered) that we cannot remove the overdispersion. One possible solution is to estimate the ϕ , the scale parameter, from the data itself and use it to adjust the variance appropriately.

The next condition, 4, is that the link function is correctly specified. There are alternatives to the logistic function.

The condition about covariates, 5, apply to the continuous independent variables (GOLDVARB X cannot estimate effects for continuous variables). This means that you have the most appropriate scale for your continuous variable and the relationship to the probability of the application value is linear. For example, if you include AGE (years from birth) as a continuous variable, this means

that AGE as measured in years from birth is appropriate (versus, say, milliseconds or fortnights from birth). Including AGE as a continuous variable tests whether or not there is a linear increase (or decrease) in the probability of the application value (versus, a squared increase, or cosine relationship).

The last condition, 6, applies to individual tokens, speakers or groups of speakers as well. If your speakers have competing (different) grammars, the results from an aggregate analysis are unstable (and unreliable).

These technical assumptions listed may seem complicated, but expand the type of questions we can ask with the statistical model and, may at times, be necessary given a particular set of research questions. There is an example later in this chapter where a useful component of these 'extra' parameters is demonstrated.

5.4.3 Contrasts

A major difference between the IPF algorithm implemented by GOLDVARB is how the factor level effects are estimated. The GLM algorithm requires you define, mathematically, the relationship between all factor levels before you can estimate them. This is done in the form of contrasts. There are two kinds of contrasts that are used in sociolinguistics (though multiple types exists): sum and treatment. *Sum* contrasts for GLM mimic those used for Goldvarb factor weights (when you have a selected 'centred' model in Goldvarb) – The uncentred Goldvarb model has important difference with GLM factor weights that are presented more fully in the next section. A *sum* contrast assume all of the factor weights sum to 0.

Let us assume that we are interested in a factor group A with three levels each having a logit effect on the probability of our binary dependent represented with β_{Ai} where i is the level (from 1 to 3). Most analysts would want to estimate the effect of each level in A. Estimating each of these effects is not possible under GLM where there is an intercept term. In order to estimate the effect for factor group A in a GLM logistic regression, we have to chose one level as a reference of some kind. Under treatment contrasts, we assume that our reference level has no effect (or, intuitively, is

a control group). So, if our reference level for factor A is 3, we have the following situation: First, β_{A3} is assumed 0, then β_{A1} and β_{A2} are interpreted in terms of level 3. That is, β_{A1} represents the effect of level 1 versus level 3 and β_{A2} represents the effect of level 2 versus level 3. This type of parameterization of factor group A is useful if we are dealing with an experimental situation in which level 3 represents a control group of some sort. This natural interpretation disappears when there is no analogue to a control group. A contrast that resembles Goldvarb's default behaviour is the *sum* contrasts. These assume that sum of all logit effects are zero. In algebraic form, this is $\beta_{A1} + \beta_{A2} + \beta_{A3} = 0$. Sum contrasts have the benefit of producing an estimate for each level of A where the interpretation is deviation from the overall logit probability of your dependent variable⁴.

There are more possibilities of contrasts, but as I have found no others that are used in the sociolinguistic literature, I do not review them here. Tagliamonte and Baayen (2012:fn7) point out that these two scales yield slightly different results when dealing with the logit effects transformed to proportions, but not in their range for the original logit form. The observational nature of sociolinguistic data (and, more specifically, its typical highly unbalanced distribution) renders the use of more esoteric and mathematically complicated contrasts less possible and illuminating for the sociolinguistic situation, but we return to a special type of contrast in our discussion on statistical significance.

5.4.4 From Goldvarb X to GLM

Translating the results in Goldvarb to output from a GLM-LR program is relatively straightforward. The estimates of Goldvarb, factor weights, can be transformed into log-odds produced by most GLM programs. Most GLM programs produce the results in terms of the logit effects, but GOLDVARB produces estimates of the proportional effects for each level. We can move between each with a simple transformation as seen in Equations 5.3 and 5.4.

⁴Many programs (e.g. SAS, R, SPSS) output every level but the last, but you can generate the logit effect of level 3 with the original algebraic expression (i.e. $\beta_{A1} + \beta_{A2} = -\beta_{A3}$ leading to $\beta_{A3} = -\beta_{A1} - \beta_{A2}$

$$p_{\text{Factor Level}} = \frac{e^{\beta_{\text{Factor Level}}}}{1 + e^{\beta_{\text{Factor Level}}}} \quad (5.3)$$

$$\beta_{\text{Factor Level}} = \frac{p_{\text{Factor Level}}}{1 - p_{\text{Factor Level}}} \quad (5.4)$$

There are major differences, however, between Goldvarb and the standard GLM LR implemented by most programs that have not been clearly set forth (and explained) in prior literature. In the table below, these differences are presented.

Goldvarb X (Uncentred Factor Weights)	GLM-LR
Factor weights are based on the number of tokens in each factor level for a factor group.	Factor weights independent of the distribution of tokens in a factor group.
Factor weights in a factor group have no predetermined mathematical relationship to one another (uncentred weights).	Factor weights in a factor group have to have a relationship (contrast) defined. There are two common contrasts: Sum and Treatment. Sum: The log-odds of all factor levels have to sum to zero. Effectively, this means if one factor weight increases, the other factor weights have to decrease the same amount. Treatment: One factor weight is set to zero (a control level) and the rest of the factor group's effects are estimated with respect to the "control". For most sociolinguistic studies, this renders the results difficult to interpret and almost impossible to compare with previous work.
Factor levels with 0 or 100 % of application value have to be excluded (slashed).	Estimates can be produced even when a factor level has 100% (0%) (because GLM-LR doesn't use the marginal distribution to start the algorithm.)
Tokens can be locally slashed (i.e. not included in one factor group's calculations, but included in the other factor groups.)	Tokens can only be excluded from the analysis for all factor groups (not just one).
Only mean effects are estimated.	Estimates of spread are calculated (standard error and confidence intervals) for factor levels, but require additional assumptions to estimate standard errors.

Table 33: Differences between Goldvarb X and GLM-LR

Some important differences between Goldvarb's uncentred factor weights (and its predeces-

sors) and GLM Logistic Regression are caused by the difference in how the underlying algorithms handle the data. The IPF algorithm underlying Goldvarb initializes the estimates of factor weights by using the raw percentage of the application value. Thus, proportions at 1.0 and 0.0 are both at $\inf$ and $-\inf$, respectively, under the logit transformation. This creates so-called knock-out effects where Goldvarb cannot proceed with a raw percent at 0 or 100. Most implementations of the GLM algorithm initialize simply with the overall percent of the application value and never uses logit transformations of the raw percentages for each factor group. This means that you can estimate effects under GLM LR even with knock-outs. The analyst, however, has to decide whether such a statistical analysis makes sense—is the effect of a factor level categorical or is there reason to expect variation? Under a GLM Logistic Regression, however, there can still be problems if too much of the data is behaving categorically. This is usually referred to as *separation* in the statistical literature and manifests itself in the failure of the GLM to produce results (SAS and R both produce detailed error messages if this occurs with a data set in the various logistic regression procedures). Moreover, in GLM (and mixed-effects) including a knock-out in the analysis means that you drive the other factor weights up (or down) in order to compensate for the large effect. Knock-outs in the analysis can cause some factor effects to appear much stronger than they truly are, because of the GLM algorithm which requires that if you have a strong effect in one direction, you have to balance that with a strong effect in another direction⁵

Why can we exclude tokens from a specific factor group when estimating the effects for the levels of that group and still keep those excluded tokens in the calculation of other factor groups effects in GOLDVARB, but we cannot perform such a thing with any statistical program that implements GLM logistic regression? The IPF algorithm treats cell counts independent from one another. Paollilo (2001: Appendix 2) gives a sketch of the algorithm used by Goldvarb. So, when calculating the effect of any given linguistic context, it is simply a matter of removing the count for tokens that have been slashed. The GLM algorithm treats any slashed data as *missing* and will

⁵If you use 'centred' effects in Goldvarb, the situation is the same.

either fail to run the analysis or exclude the whole token from the analysis.⁶

5.4.5 Logistic Regression with Random Effects

Random effects for speakers were first suggested for sociolinguistic data by Saito (1999). Johnson (2009) more recently, advocated not only adopting these models, but also produced an interface for R, Rbrul, that provides a GLM based implementation of factor weights. In this subsection I present an intuitive description of random effects and discuss some problems for variationists when using these models. Mixed-effects models are named because you are modelling two types of effects: fixed and random. Fixed effects are meant to be the main objects of interest. The random effects are nuisance parameters. The random effect most discussed by sociolinguists is speaker as a random intercept. Most of the sociolinguistic literature that discusses random effects fails to consider very important differences in interpretation when the dependent variable is categorical rather than continuous. This section presents the mathematical background for both linear (i.e. continuous dependent variable) and generalized linear (i.e. categorical or count dependent variable) models with random effects and explains the very important difference in interpretation between the two.

Random effects differ from fixed effects by the addition of a random component to the model. We have to consider not only the probability of our application variable (y), but we add a random intercept for the effect of each subject to the model changing 5.2 into Equation 5.5.

$$\log\left(\frac{y_j}{1 - y_j}\right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i + \zeta_j \quad (5.5)$$

The addition to this model is of the random intercept at the end which represents speaker j 's log-odds of using the application value ⁷ where j is between 1 and N (number of speakers in your sample). The random component is not computationally free. The new random intercepts are assumed to have a normal distribution and a second source of noise, algebraically represented:

⁶This behaviour is variable and programmable in most statistical software packages. In R's GLM procedure, for example, the `na.action` parameter can be set to different options for NA or slashed tokens.

⁷This is assuming speaker is your random effect. You could choose words as a random intercept (or make a more complicated random component with crossed speakers and words, see Baayen, Davidson and Bates (2008) for an example of this in psycholinguistics.

$\zeta_j \sim N(0, \Phi^2)$. The variance, Φ^2 , is the amount of noise contained in the mean log-odds of your speakers. We cannot draw inference on the random intercepts for each speaker (this would require more assumptions). The Φ^2 effects the statistical significance for each fixed effect in the model.

There are two main classes of statistical models that extend GLM to account for multiple tokens from the same subject. Subject-specific models, such as random effects, directly estimate a mean effect for each subject⁸ and then uses the variance from those estimates to produce estimates of your fixed effects (and estimates of statistical significance). The alternative class is a *marginal* model where there are no overt parameters included for the subjects, but instead a parameter of association is used (e.g. Roy, 2006). While these two families of models have many similarities, ”despite these severe similarities between the marginal and random-effects model specifications, both families often produce very different results, confusing many statisticians less familiar with these types of models” (Molenberghs and Verbeke, 2005: 298). The confusion can be clearly seen when we examine the technical structure imposed by a population interpretation. For subject-specific models, we can marginalize the fixed-effects formally by taking the expectation of the expectation of the fixed-effects conditioned on the random-effects. The deep differences between these two classes of models has been well established throughout the statistical literature (see Hu et al., 1998; Gardiner, Luo and Roman, 2009 for in-depth discussion) and, further, when marginal interpretations are needed technical extensions to logistic mixed-effects models are needed (e.g. Torres and Macchiavelli, 2007).

For the difference between marginal and subject-specific interpretations, I examine the mathematical underpinning of these models from Molenberghs and Verbeke (2005)⁹

From Molenberghs and Verbeke (ibid: 299):

$$E(Y_{ij}|b_{ij}) = \frac{\exp(b_i + \beta_0 + \beta_1 + \dots)}{1 + \exp(b_i + \beta_0 + \beta_1 + \dots)} \quad (5.6)$$

⁸Or other cluster. Smaller clusters can be conceived of and modelled (e.g. Word-level effects).

⁹Molenberghs and Verbeke provide a succinct mathematical presentation of problem not as well described by other sources. They also suggest an algorithmic solution, but this solution only generates estimates without measures of variance (or statistical significance).

$$E(T_{ij}) = E(Y_{ij}|b_{ij}) = E \left[\frac{\exp(b_i + \beta_0 + \beta_1 + \dots)}{1 + \exp(\beta_0 + \beta_1 + \dots)} \right] \neq E \left[\frac{\exp(\beta_0 + \beta_1 + \dots)}{1 + \exp(b_i + \beta_0 + \beta_1 + \dots)} \right] \quad (5.7)$$

The $\neq$ in 5.7 is very important. In straightforward terms, it means that we cannot consider the estimates of factor effects with random effects the same as estimates of the factor effects for the population. The estimates produced are conditional on the speakers (or the random effects)-we cannot generalize or draw inference on these estimates as if they apply to the whole population. This type of inference may be what the analyst wants (e.g. third-wave studies¹⁰), but it probably is not what other studies could use. The interpretation here is not presented by either proponents of these models or the scholars in sociolinguistics who use them. Yet, this is a fundamentally important component of interpretation that is absent from the sociolinguistic literature on the application of mixed-effects models.

The machinery for logistic mixed effects regression is built on the GLM algorithm, and, as such these mixed effects models inherit the same set of differences that GLM has with the IPF (Goldvarb) algorithm.

I briefly describe another approach that might seem reasonable as alternative to mixed-effects models, but is inappropriate as demonstrated in previous statistical work: treating speakers in logistic regression as a fixed effect. Sometimes, as a response to the proposal of random effects models, those working in a variationist framework reply that you can treat speakers as a factor group (i.e. fixed effect) rather than using a different statistical model (e.g. Paolillo, 2013; Young and Yandell, 1999). There are a set of findings beginning in 1948 and continuing through the present day literature as to why this is not appropriate and why such an approach generates results that are unreliable. I summarize below the statistical issues with speakers as a fixed effect and discuss the issues presented by Paolillo (2013).

Neyman and Scott (1948) demonstrate that as the number of subjects gets larger, for a logistic model, the estimates of all of the fixed effects become more statistically inconsistent. The more

¹⁰ Eckert (2012) has an overview of the different *waves* of sociolinguistic analysis of socially motivated linguistic variation. Third-wave studies focus on situating the individual speaker's linguistic behaviour with respect to all of the social groups the speaker may be a part of. A random-effects approach might be beneficial in such circumstances, but our focus here is on the linguistic constraints on variation in language.

speakers the less accurate the model is. Breslow and Day (1980: 249-251) presents a technical outline of the problem that reinforces Neyman and Scott's original conclusions. Molenberghs and Verbeke(2005:258), relying on the two citations above, dismiss this approach as a possibility due to statistical reasons. Paolillo(2013) addresses the issue of the number of speakers and the number of tokens per speaker, but, unfortunately, does so while using speakers as a fixed-effect in the model. The guidance from the statistical literature, however, is not favorable to treating speakers as a random effect either. In McCollough (1996) the decisive criterion for determining what is a fixed versus random factor is whether we can treat the factor as a random sample from a larger population. Speakers are clearly not random in most sociolinguistic analyses under the technical sense of random. Sociolinguists do not sample speakers from a community in a random way. Statistical representativeness of a sample of speakers from a community has been a methodologically contentious issues from the beginning of modern sociolinguistics. Labov (1966) attempted a true random sample of speakers in New York City, but of the 340 speaker selected at random only 88 could be located and agreed to participate. Fasold (1972) used a judgement sample, common in many following studies (Milroy and Gordon, 2003: 21-48), where the social characteristics of the sample were determined and speakers who met those characteristics are sought out (i.e. the number of men versus women and the age distribution were set prior to seeking speakers). Wolfram (1969) generates a random sample of speakers by using an already available set of 700 interviews and selecting at random 48 interviews to use. Wolfram's approach is actually a first stage to what modern statisticians would do to induce randomness in a non-random set of data: select a random subset of the data and estimate the effects; repeat this process again and again generating a set of global factor weights (see Good (2013) for an overview).

In this section, speakers as either a random or a fixed effect in sociolinguistic statistical models were considered. Treating speakers as a random effect can be problematic and such an approach has requirements that researchers should be aware of. Treating speakers as a fixed effect is shown by a well established literature to be inappropriate for the statistical model used in sociolinguistics.

5.4.6 GLM and Random Effects in Sociolinguistics

Johnson (2009) argues for the replacement of GOLDVARB X by either a GLM logistic regression or mixed-effects models (with speaker as a random effect) for several reasons presented below.

1. Log-odds are additive, probabilities are not (p. 361)
2. Continuous variables should not be binned.
3. Interaction can be modelled and tested for in an easier manner.
4. Rbrul handles knockouts (linguistic contexts where an application value is 100 or 0 percent).
5. Random Effects account for idiosyncratic frequencies in some speakers.

Johnson's argument starts from the assumption that there are differences between Goldvarb X and the standard statistical analysis applied in psycholinguistics and that Goldvarb is in the wrong. Each of the reasons given by Johnson above either argue against notational variance between variationist and psycholinguistic methodologies (in favor of psycholinguistic) or present arguments orthogonal to some variationist research interests (e.g. the flagging up of knockouts in sociolinguistic data).

The first four arguments can be readily dealt with. Log-odds can be generated from factor weights as demonstrated earlier. Whether or not a variable is continuous should be established by the researcher prior to the data collection. Some suggest that as 'Age' is a numerical variable (usually measured in years since birth), sociolinguists should not categorize it (young versus old, for example) but treat it instead as a continuous predictor. This critique, however, ignores the fact that almost every sociolinguistic corpus is constructed by sampling according to pre-defined age cohorts. A balanced or near balanced sample is often sought. In other words, these cohorts are naturally defined from our sample of speakers from the community and should be maintained in the statistical analysis. Moreover, 'Age' as continuous predictor is not necessarily the best operationalization of the hypotheses that the analyst may wish to test (e.g. Pichler, 2013 and the

life-stage model). Next, interactions can be handled in Goldvarb in a complicated manner, but the ease of estimation provided by most modern programs for interaction terms belies the difficulties in their interpretation especially when we move beyond 2-way interactions. Finally, knockout situations should not be handled automatically by the statistical program. Categorical behaviour should be flagged to the analyst because in linguistics there are two possibilities: the behaviour is truly categorical or it reflects a very high or very low rate of occurrence. Also, as discussed earlier, including knockouts in the analysis means that the range estimates are inflated because of the nature of GLM-LR and logistic mixed-effects contrasts.

The last criticism requires a more complicated response. In sociolinguistics, speakers are the most widely used random effect. In effect, we add a parameter for each speaker that estimates each speaker's corrected mean (in terms of log-odds) of application value. We assume that each speaker differs in overall corrected mean, but shares a variance that is distributed normally. The same argumentation follows when we add word level random effects (e.g. Baayen, Davidson and Bates, 2008). A natural question that occurs when describing speakers as random effect is "Why not just add speakers directly to the model as a factor group?" An established result in statistics addresses this situation: Neyman and Scott (1948) show that if we take repeated samples from speakers and include speakers as fixed-effect in a model, the estimates of other fixed-effects become highly unstable as we add speakers (in effect, adding more speakers would make our factor weights unreliable). This motivates the development of random effects, with a separate assumed noise (or variance parameter).

Johnson (2009:365) presents random effects as accounting "for the variation in a population" which is "more important than knowing the exact values of individual effects". Underlying this type of model, is the assumption that speakers have an idiosyncratic corrected mean (or more precisely corrected log-odds) while sharing the same direction and magnitude of effects for the para-linguistic, extra-linguistic and linguistic factors. Much of the heated controversy that the debate surrounding random effects generates in sociolinguistics is due to the conflation of spread and central tendency in mixed effects models and the ignorance of the important fact that the

fixed effects in a logistic mixed-effects model are conditional on the random effects. In brief, the estimates you generate for fixed-effects are averages (i.e. of central tendency) controlling for the other fixed effects in a model conditioned on the random effects (regardless of what variables you assign as random effect–speakers, words, etc.).

At the inception of variationist sociolinguistics, a real concern was what if individual speakers do not share a community grammar then could all tokens be grouped together for a statistical model that does not at least test for or take into account such a possibility? Sankoff (1973, 1974) carefully discusses the issues involved. Guy (1988) finds that linguistic contexts with less than 30 tokens generate different constraint hierarchies when running separate analyses for each speaker. Many times in the literature what appears to be individual speaker difference is really due to a low number of tokens either per speaker or in the linguistic context being examined within the speaker as I demonstrated in a separate study for mixed-effects models (Roy, to appear).

Freedman in the quote below is discussing a problem he has seen in his career as a statistician and is applicable to the discussion of mixed-effects models in sociolinguistics. In creating and refining the algorithms, there are a transparent set of assumptions (as mentioned earlier by Sankoff (1988/2005), Cedergren (1973), Cedergren and Sankoff (1974), Guy (1988)). The literature reflects an in-depth discussion of when Goldvarb (and its predecessors) fail to be applicable and what concomitant assumptions are required to ensure the results are reliable. When mixed logistic regression random effects are presented and advocated for, however, neither their underlying assumptions are scrutinized, nor are their potential shortcomings discussed.

Naturally, there is a desire to substitute intellectual capital for labour. That is why investigators try to base causal inference on statistical models. The technology is relatively easy to use and promises to open a wide variety of questions to the research effort. However, the appearance of methodological rigour can be deceptive. The models themselves demand critical scrutiny. Mathematical equations are used to adjust for confounding and other sources of bias. These equations may appear formidably precise, but they typically derive from many somewhat arbitrary choices. Which vari-

ables to enter into the regression? What functional form to use? What assumptions to make about the parameters and error terms? These choices are seldom dictated by data or prior knowledge. This is why judgement is so critical, the opportunity for error so large, and the number of successful applications so limited. Freedman (2010:xiv)

There are other fields which have been using logistic mixed effects models and have found several problems with logistic mixed-effects models that sociolinguistic variationists should be aware of:

- A logistic regression with speaker random effects underperform in highly unbalanced data (Pacheco, et al., 2009; Theall, et al., 2011).
- If the assumption of normality is inaccurate for the random effects the factor weights also may be biased (Litière, et al., 2007a,b).
- If the number of tokens per speaker is meaningful (i.e. the number of times the variable occurs), then the estimates for the linguistic factors are also biased (Neuhaus and McColloch, 2011).
- Analyses with less than 30-50 tokens per speaker with at least 30-50 speakers vastly overestimate variance-increasing the likelihood a real effect will not obtain statistical significance (Moineddin, Matheson and Glazier, 2007).

None of these weaknesses or problems are mentioned where random effects models have been advocated in the sociolinguistic literature.

Mixed-effects models can be useful, however, when the caveats and limitations discussed above are accounted for. There are sets of data, as sociolinguistics begin to use larger and larger corpora, where the number of tokens per speaker and the amount of speakers per model are above 50. If the distribution of tokens is unbalanced, but not severely so, mixed effects models may be productive. Furthermore, much of the discussion of mixed effects models has focused around the differences that such models have on social effects. What is unexplored by sociolinguists, however, is the

effect that these models have on linguistic constraints based on mental processing where we might expect individual differences to affect the overall estimate of such an effect. As larger data sets become available and as sociolinguistic further investigate processing constraints on a number of linguistic variables, mixed effects models should prove most useful.

5.4.7 Statistical Significance

In previous sections the difference in how each method estimated the effects were discussed, but an important difference between Goldvarb X and modern statistical programs is the availability of alternative methods of assessing statistical significance. Variationist sociolinguists have been using log-likelihood tests in conjunction with a step up and down procedure (Sankoff, 1988; Bayley, 2013; Guy, 1988) to establish the significance of a factor group. These log-likelihood tests produce the set of factor groups that explain a majority of the variation in the selection of the application variant for sociolinguistic data while excluding those variables that do not explain “enough” (at a 5% statistical significance level) of the variation. The purpose of these tests is to, as Hardin and Hilbe (2001:45-6) state, balance our desire to “increase the likelihood with the competing desire for model parsimony”.

Johnson (2010) citing Harrell (2001) claims that stepping up and stepping down tests are problematic for a variety of technical reasons. It is not uncommon to come across statisticians who deplore stepwise procedures in any form (e.g. Thompson, 1995,2000). Johnson’s list is recreated below:

1. Test statistics do not have the correct distribution (therefore, p-values and standard errors are too low.)
2. Multiple Comparisons (p-values are too low).
3. Regression coefficients are biased in favor of larger coefficients.
4. Multi-collinearity makes variable selection arbitrary.

Nonetheless, these reasons do not apply to situations that sociolinguists can encounter, such as studying a new linguistic variable that does not have an established literature. In medical sciences where there is an extensive body of quantitative studies for a particular dependent variable, testing a factor (or covariate) via stepwise techniques is problematic. In fact, for confirmatory inference, stepwise techniques are best avoided for alternative assessments of statistical significance. In sociolinguistics, this would be analogous to a variable that has been studied by variationist many times before (e.g. t/d deletion) where a set of factors has been established as significant in prior literature. Otherwise, in exploratory inference, where the set of significant factors has no (or very little) prior establishment in the literature, stepwise procedures can be useful in eliminating factors that do not provide information about the dependent variable under study. For example, the linguistic variable we are studying in this thesis, adverb modification of the present perfect, has no prior quantitative study (i.e. one that employs inferential statistics). In this case, an exploratory approach is necessary—not every factor group gleaned from the non-quantitative literature will be significant and including factors that are truly not statistically significant in the analysis also biases the results.

GLM and Mixed-effects models offer an alternative to stepwise assessment, however. They offer Type III tests of significance which assess the statistical significance of each factor group against the model with all other factor groups included. This can offer an acceptable alternative to stepwise methods in situations where confirmatory analysis is more appropriate. There are further tests that can be used to look inside a factor group (one that has obtained statistical significance). A common test is a Wald z-score test (Agresti, 2002: 155) which tests if each factor level is significantly different than the 0 (formally, the null is $H_0 : \beta_i = 0$ versus the alternative hypothesis, $H_a : \beta_i \neq 0$) while accounting for the variation in the rest of the data. A useful test implemented by many statistical programs, called *Least-Square Means* or *lsmeans*, assesses the hypothesis that one factor level is (statistically) the same as another factor level within a factor group. We present in the next section an important result for our data that comes from *lsmeans*. This test is not implemented

in Goldvarb, but is implemented in SAS for both of the other models ¹¹.

5.4.8 GLM and Mixed-effects Results

This section discuss the final statistical model examined in this work, a logistic mixed-effects model with speakers as a random effect. The results are compared to the previous two models. For our Early Modern English data, the mixed-effects model fails to converge (due to the sparsity of the data by writer), but we present results for the GLM-LR and Goldvarb runs. Stepwise selection is used to assess significance across the models. In order to compare results between the models in a valid manner, all of the factor groups that are selected as statistically significant by any model (for each data set) are included.

Group	Factor	Goldvarb	GLM LR	% Adverbs	N
	Corrected Mean	0.39	0.32	40	629
Reading	Continuative	0.78	0.87	71	222
	Resultative	0.36	0.36	27	285
	Experiential	0.23	0.21	17	101
	RANGE	55	66		
Negation	Negative	0.71	[0.73]	76	29
	Positive	0.48	[0.27]	39	600
	RANGE	23			
Voice	Passive	[0.57]	0.60	39	153
	Active	[0.49]	0.40	41	476
	RANGE		20		

Table 34: Factor Weights from Goldvarb and GLM-LR in Early Modern English

In Table 34 the results produced by PROC GENMOD (code in appendix) and Goldvarb are displayed. Voice obtains statistical significance with our GLM-LR model and Negation loses it in this model. Although there are no statistical indications of interaction occurring in this data (as discussed above for the Goldvarb results), the reversal of constraints for Voice from the distributional

¹¹There is an `lsmeans()` function in R for glm models, but it is not the logistic mixed-effects model

results might be an artefact of its marginal statistical significance. The size of effect increases from 55 to 66 in GLM-LR from Goldvarb. The direction of effects do not change between the analysis, but size of factor weight change. In the Negation group, positive tokens go from a neutral effect to strongly disfavoring adverbs in the newer models.

Group	Factor	Goldvarb	GLM LR	Mixed Effects LR	% Adverbs	N
	Corrected Mean	0.46	0.25	0.33	46	641
Reading	Continuative	0.93	0.94	0.95	91	261
	Experiential	0.17	0.23	0.21	19	162
	Resultative	0.13	0.17	0.17	12	218
	RANGE	80	77	78		
Subject	1st Person Singular	0.61	0.70	0.72	51	274
	3rd Person	0.44	0.54	0.56	51	152
	1st Person Plural	0.43	0.54	0.55	45	108
	NP	0.40	0.46	0.44	29	90
	2nd Person	0.26	0.26	0.24	11	17
	RANGE	35	44	48		
Negation	Positive	0.52	[0.62]	[0.62]	46	600
	Negative	0.28	[0.38]	[0.38]	44	41
	RANGE	24				

Table 35: Factor Weights from All Three Statistical Models in Canadian English

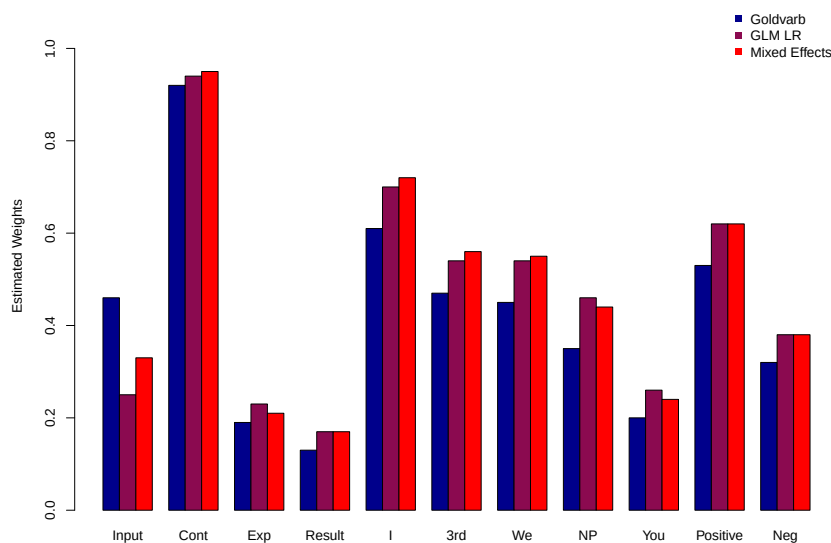


Figure 10: Graph of Factor Weight Estimates in Canadian English data by Method

We have all three results in 35 for the estimated probabilities for factor groups selected in at least one statistical analysis in Canadian English. Negation loses statistical significance under the GLM-LR and Logistic Mixed Effects models. The factor weights are almost identical for both newer models, but differ somewhat in strength from Goldvarb. The strength decreases by 2 or 3 for the reading group’s effect with both newer models. The reading group represents in the data the most “balanced” factor group with a high number of tokens in each factor. We see a moderate favoring effect in first person singular contexts become a strongly favoring effect in both newer models. The range for grammatical subject increases from 35 under Goldvarb to 44 under a GLM-LR model and 48 with the logistic mixed effects models. For positive clauses, again we see a neutral effect under the Goldvarb become a favoring effect with both of the newer models. Figure 10 illustrates these inflated weights (in both directions) for the GLM-LR and Logistic mixed effects models. The models differ mostly where there is an uneven distribution of tokens across factors. In Person, there is the largest difference between the three models, where Goldvarb (using uncentred weights) does not have to account for the low estimate in 2nd Person with a concomitant increase

in other factor weights, but the GLM and Mixed-effects models do.

Reading 1	Reading 2	Estimate	Std. Error	Z-Value	P-value
Early Modern English					
Continuative	Experiential	2.4965	0.3091	8.08	<.0001
Continuative	Resultative	1.9063	0.2091	9.12	<.0001
Experiential	Resultative	-0.5902	0.2997	-1.97	0.0489
Canadian English					
Continuative	Experiential	3.9853	0.3327	11.98	<.0001
Continuative	Resultative	4.4017	0.327	13.46	<.0001
Experiential	Resultative	0.4165	0.3007	1.38	0.1661

Table 36: Post-Hoc Comparisons for Reading in Both Data Sets

Nonetheless, for the newer models there is the additional tool of a post-hoc analysis exemplified in Table 36 for both sets of data and the factor group of reading. Once a factor group obtains statistical significance, there is justification to examine the internal comparison of each factor against another in the group and test the hypothesis that there is no significant difference for the factors via the least square means test provided PROC GLIMMIX/PROC GENMOD. Continuatives are significantly different than resultatives and experientials in both data sets ($p < .0001$ for all comparisons). The difference between resultatives and experientials does not obtain statistical significance in Canadian English ($p = .1611$), but does obtain statistical significance in our Early Modern English ($p = .0489$). These tests are not available in Goldvarb.

5.5 The Perfect Approach to Adverbs

We are now in a position to return to the research questions posited at the outset of the study, and to evaluate the utility and efficacy of competing statistical methodologies for modelling the variability in the synchronic and diachronic datasets. The contribution of our data to the initial hypotheses in chapter 4 and larger research question about the interdependence of adverbs and the present perfect is discussed for each set of results. Hundt and Smith (2009:52) report an overall adverbial rate for 20th Century US English and British English at 45% and 29%, respectively. Both the US

and British rates, however, cannot be fully explained until the linguistic contexts in both varieties are controlled for.

We reproduce our original set of hypotheses from chapter 4 below for the factor groups that condition the appearance of adverbs with present perfects.

- Continuative clauses are more likely than Experiential to have overt adverbial modification.
- Experiential clauses are more likely than Resultative to have overt adverbial modification.
- +Dynamic predicates should have a neutral or disfavoring effect on the production of adverbial modification for the present perfect.
- +Telic predicates should favor adverbial modification.
- +Durative predicates should favor strongly adverbial modification.
- Positive clauses are more likely to have adverbial modification.
- 3rd Person and NP clauses are more likely to have adverbial modification.
- Passive sentences are more likely to have overt adverbial modification.

Each of these hypotheses tests whether adverbial support is independent of the core meaning of the present perfect. Thus, if they are all verified in our data, we would have overwhelming evidence that adverbial support readings independently of the core meaning of the present perfect and that the present perfect itself conveys a broad perfect meaning that interacts with and is independent from adverbial support. Yet, when we examine all of our distributional and statistical evidence, what emerges is somewhat conflicting evidence. In Table 37, our results are represented for each hypothesis. Results in our statistical model that confirm the above hypotheses are indicated with a ✓. A [✓] indicate that the hypothesis is confirmed in the distributional data, but does not obtain statistical significance. An ✗ indicates where the data provides evidence for adverbial dependence.

Hypothesis	Early Modern English	Canadian English
Continuative	✓	✓
Experientials	✗	✓
+Dynamic	[✓]	[✓]
+Telic	-	-
+Durative	[✓]	[✓]
Positive Sent.	✗	✓
3rd Person / NP	[✗]	✗
Passive	[✗]	✗

Table 37: Hypotheses

The only two sets of hypotheses that fail to obtain in our data for Canadian English are those that support indirectly the overall hypothesis of independence: Grammatical Subject and Passivity. Both are based solely on Elsness' (1997) study and are testing whether or not non-frequent contexts for the present perfect (versus the preterite) are likely to co-occur with adverbial specification. Moreover, for other linguistic contexts we have several semantic claims reinforce these empirical observations. When we set aside these two hypotheses, the Canadian English data confirm the claim of adverbial independence. This same result, however, does not obtain for the Early Modern English data.

In both the distributional and multi-factor analyses negation has a strong effect on the appearance of adverbs. Negation's effect in our modern data coincides again with the hypothesis that negation itself atelicizes and, further, provides a type of present perfect reading without any linguistic support required (i.e. it is an adverb in and of itself). For our negative sentences in the Early Modern English data, we have a strong favouring of adverbial support that reverses itself in the Canadian English data set. There are two possible explanations for this unpredicted favoring of adverbial support. First, specific to negation in English, 1400-1700 represents a period of syntactic change (Kroch, 1989,1994; Warner, 2005). Outside of the present perfect, there is variation in

negative sentences without an auxiliary, between the older inverted form (e.g. *I went not to the market last week* and the innovative DO support (e.g. *I did not go to the market last week*). I discuss elsewhere the possibility that DO-support in negative sentences during Early Modern English is not in fact pleonastic as claimed for Modern English (e.g. Lasnik, 1995), but does encode some semantic meaning and competes with the present perfect during this period (Roy, 2007). The strong favouring of adverbial support in present perfects during the Early Modern English period could be an epiphenomenon of the development of DO-support where the adverbial modification is necessary to clearly reinforce the meaning of the present perfect in negative contexts where DO-support might otherwise be an option.

The major factor affecting the use of adverbial support with the present perfect in Canadian English concerns the different readings associated with the present perfect. The fact that continuative readings strongly favor adverbial support, while the experiential and resultative readings require it much less, strongly indicates that the present perfect itself has an internal reading that spans both the experiential and resultative types, but does not include continuativeness. Further, the differentiation between the resultative and experiential is neutralized with respect to adverbial specification as demonstrated with the post-hoc tests for the factors in this group. For the present perfect reading in Early Modern English, we have experientials less likely to co-occur with adverbial support than resultatives – an fact that is not easily explained given the putative development of resultatives before experientials in English. Further, this difference obtains statistical significance when tested directly while in our Canadian English data the difference between adverbial specification in experientials versus resultatives does not acquire statistical significance. In Early Modern English there is less adverbial support for continuative tokens, but more adverbial support for resultatives than in the Canadian English data. The fact that the present perfect itself is not completely independent from adverbial support in the Early Modern English data could derive from the fact that the form has not fully grammaticalized into its present day meaning (this explanation is somewhat tentative due to the unexpected ordering of the resultative and experiential readings in Early Modern English). In other words the present perfect, in Early Modern English, had available

to it all of the present day readings (Continuative, Experiential and Resultative), but the form itself had not acquired the grammaticalized current relevance meaning. Several lines of evidence seem to reinforce this possibility.

First, in Canadian English, we do not have any present perfects co-occur with definite time adverbials. In the Early Modern English data, we have 7 tokens that have definite temporal adverbs, as in (12).

(12) My Lady Rockingham **has been** with me yesterday. (PCEEC/Hatton/148.046.1130)

Further, we have no examples in Canadian English of present perfects that are doubly marked with the present tense. In our Early Modern English data we have 14 examples, such as (13).

(13) for hee would find an uncomfortable howse at Sprowston- where there are & **have been** so many sick. (PCEEC/BROWNE/159.028.548) [Modern English: for he would find an uncomfortable house at Sprowston- where there are & **have been** so many sick.]

In both cases, the ability to co-occur with definite past adverbials and the ability to have the present relevance meaning reinforced by the use of the present tense explicitly indicates that the present perfect itself had not fully grammaticalized the present perfect meaning and may have required more contextual support.

When the results of this investigation are considered in the aggregate, the conclusion that emerges from this study is that adverbial support in Canadian English functions independent from the core present perfect reading in the form itself with continuatives as the exception. Recall the stages of the present perfect's development as summarized by Copple(2010) and reviewed in Chapter 3. The present perfect in Early Modern English represents the stage where the present perfect has acquired its broad meaning of present relevance. Every reading is used in this period and while some kinds of lexical aspect have a low number of tokens, they all are represented in our data indicating each class is possible, even if not frequent, with the present perfect. The constraints on adverbial support occurring with the present perfect itself could be indicative of the initial grammaticalization stage. Once the present perfect meaning has established itself within the present

perfect, we see a different relationship emerge between adverbial support and the form itself in Canadian English. In Early Modern English, conversely, there is evidence of some dependency between adverbs and the present perfect itself and the present perfect has not fully acquired the broad meaning it has in Canadian English.

In our Early Modern English data, there is evidence the present perfect has not obtained a specialized present perfect meaning and requires adverbial support, at least in the absence of other structural cues, to produce the meaning which seems to have become an intrinsic component of the present perfect in modern Canadian English. In the Canadian English data there is less support for treating the present perfect function as one coherent variable context where experientials and resultatives only employ adverbial support occasionally whereas continuatives employ adverbial support almost categorically. In the Early Modern English data another problem presents with the variable context of the present perfect function: the present perfects themselves that surface may not always be within the context as the possibility of wholly past use as evidenced with the occurrence of definite time adverbials with present perfects.

5.6 Which Statistical Model?

While many proponents of mixed-effects models have strongly argued against the use of Goldvarb, I do not argue here for the opposite position (i.e. that only Goldvarb should be used), but for an intermediate position: while each tool has its benefits and uses, sociolinguists should be aware of the limitations of each technique and be willing to use hybrid approaches when needed.

A cursory survey of the literature, moreover, has indicated that logistic mixed-effects models require at least 30-50 speakers and 30-50 tokens (as a minimum) per speaker to produce unbiased estimates that are unaffected by the binary (or multinomial) dependent variable investigated in many sociolinguistic types of data. The desideratum of 30-50 tokens for 30-50 speakers is rarely met in most extant studies of morpho-syntactic variation. The data here is an example of such a data set as Table 38 demonstrates. Most of our speakers do not pass the 30 tokens minimum threshold

and, as is common with morphosyntactic variables, the distribution of tokens per speaker is highly unbalanced. One possible solution to this imbalance would be to acquire more data. While the addition of more speakers to the sampling population is a possibility, there is still no guarantee that speakers will produce the requisite number of tokens. The paucity of tokens is a problem that lies at the heart of the study of morphosyntactic variation. Unlike phonology where there is often a robust amount of tokens and, some times so much that there are methods in place to exclude too many tokens from the same speaker (Milroy & Gordon, 2003:151), morpho-syntactic variables often produce a small amount per speaker (ibid:172-176). For our historical data, Labov's (1972: 100) adage that "The great art of the historical linguist is to make the best of this bad data" directly applies. We are left with 'bad' data in that what survives to present day is often accidental, patchy and fragmentary. The analyst has to make the best of what survives, even with the advent of newer statistical models.

Further, even logistic regression (without random speaker effects) lacks the ability to set aside tokens for just one factor group (i.e. Goldvarb's '/' operator). This is an important element in many studies of morpho-syntactic variation where for a particular factor group, it doesn't make sense to assign a code a subset of the for a given factor. The newer programs and algorithms, however, are not without any benefit to sociolinguists for morphosyntactic variation. One such example, discussed in the previous section, is the ability to conduct post-hoc tests on are data when there is a theoretically motivated reason to do so. The neutralization of the difference between experiential and resultative marking could have been descriptively inferred from the closeness of the Goldvarb estimates, but we were able to strengthen this conclusion by drawing on the statistical tools of competing programs. These formal tests allow us to clearly establish when two or more factor levels within a group have the same effect, statistically, on the selection of the application value.

The difference most important to sociolinguists, however, between all of our models is not the underlying assumptions for each model, but a difference in each model's results: the range is inflated under both a GLM and logistic mixed effects model. The alternatives to Goldvarb place a constraint on factor weights in factor group to produce log-odds versions that sum to 0. This

means when a strong factor occurs within a group, the other factor weights cannot be neutral, but must increase or decrease accordingly. This creates inflated range values that artificially increase the strength of a factor group, as in the results for Early Modern English and Canadian English.

Speaker	% Adverb	n
301	70	130
311	29.11	79
308	38.64	44
315	23.81	42
313	35	40
309	65.71	35
314	38.71	31
304	48.28	29
306	42.86	28
318	36	25
320	26.09	23
302	40.91	22
307	54.55	22
303	50	20
316	57.89	19
310	62.5	16
319	20	15
317	42.86	14
305	57.14	7

Table 38: Distribution of Data by Speaker for Canadian English

Further, when the focus of the investigation is the linguistic constraints, mixed-effects models do not provide any substantively different conclusions from GLM logistic regression or IPF logistic regression in terms of the order of constraints if there is enough data. Where these models differ is for linguistic contexts that have small amounts (less than 20 tokens (Roy, to appear)) of data. The IPF algorithm (uncentred) has the benefit of taking into account the number of tokens in a factor while GLM algorithm and mixed-effects model do not. Sociolinguistic studies can benefit from newer statistical models, but sociolinguistics should not eliminate lines of inquiry because of their technical requirements. In sum, for situations where the focus is on the linguistic constraints (and not social factors) there are several best practices that come from this work and

the previous literature: In situations where there are a low amount of tokens from some or many of your speakers (30-50), Goldvarb or the logistic regression (GLM) in standard statistical software programs produce similar results, but mixed-effects models can produce biased results that are not useful; If you have a low number of tokens in linguistic context (less than 20), you should consider using Goldvarb rather than GLM logistic regression as Goldvarb's uncentred weights are sensitive to the number of tokens in each factor; When there is a large amount of data (at least 30 speakers with at least 30 tokens per speaker), the results from each model will be analogous, with some differences between Goldvarb and the other two models, because of the unbalanced distribution of linguistic contexts present in most sociolinguistic data— The ordering of constraints should not differ between the three models, but the range (or strength of effect) will. So, in some situations, Goldvarb can be preferred, but when you have a lot of data, any of the three options will do. Moreover, if we consider the data examined here, there is no case in which the mixed-effects models could be preferred as the research focus is on linguistic rather than social constraints¹².

To conclude the analysis of the statistical models in this chapter, Young and Yandell's (1999) response to Saito's (1999) critique of Varbrul is appropriate (Young and Yandell, 1999:485):

Researchers should, however, be aware that sophisticated analytical tools are mere servants of researchers' theories. The tools help us to answer questions that a theory has helped us to ask. Bottom-up analyses of interlanguage (JR: or language more broadly), no matter how sophisticated the tools of analysis, produce facts without a context in which those facts can be interpreted.

Logistic mixed-effects models represent on some level a 'Bottom-up' analysis. They presuppose that each speaker has an estimable mean effect and that this effect is distributed normally with a shared variance. If these assumptions are incorrect, the bias in the factor estimates are exacerbated with fewer than 30 tokens per each speaker and at least 30 speakers. Both GLM and logistic mixed-effects impose a 'bottom-up' assumption on each factor group that their estimates

¹²The constraint on the amount of data, however, extends readily where there are social factors. Thus, even if we are examining social factors, the minimum of 30 tokens per 30 speakers is still in effect. Otherwise, according to the literature reviewed in this chapter, the results are still biased.

have to be all related. This does not allow for factors to have a neutral effect, if another factor in the group has a very large effect on the variation. This inflates the range for the factor group and can make factor groups appear stronger than they actually are. It can also artificially increase or decrease a factor's effect to account for a concomitant decrease or increase in another factor's effect in the same group.

This thesis provides a test of each the three discussed statistical models: the IPF algorithm, with uncentred weights as implemented by GOLDVARB; the GLM LR response as implemented by SAS's PROC GENMOD procedure; the logistic mixed effects model as implemented by the PROC MIXED¹³. As discussed previously, the focus of our analysis is not on the social factors that have underlined much of the previous debate, but on the linguistic grammar represented in the multi-factor constraint hierarchy. In examining the effect of linguistic variation our data are sparsely distributed over a wide variety of speakers and writers where these newer statistical models have weakness evident in both a more thorough review of the literature than has been done by their current advocates previously and a research question that focuses on the linguistic factors rather than social ones. All of these statistical tools are just that – tools. While GOLDVARB (and its underlying IPF infrastructure) provides useful analyses, GLM-LR can also provide an insight into the structure underlying the linguistic variation of interest as seen in the post-hoc tests for a factor group. All these statistical models can be used together in ways appropriate to answer research questions as long as their assumptions and weaknesses are accounted for by the analyst.

¹³There are some small differences between how SAS and other packages implement these two techniques. The solution from R or SPSS for these models should be the same.

Chapter 6

Conclusion

There are three main contributions of this work which are linguistic and methodological in nature. The first contribution is to our understanding of the development of the present perfect summarized in section 6.1. The second contribution is to broadening our understanding of the present perfect in Modern Canadian English which is presented in section 6.2. The third contribution is to statistical models in sociolinguistics, elaborated in 6.3. Both sections are concluded with a discussion of the possible future research paths that derive from this dissertation's contributions. Section 6.4 provides a brief summary of the analysis.

6.1 The Present Perfect and Adverbs

The data showed in both time periods that while adverbs are highly favored in continuative contexts, they are strongly disfavored in experiential and resultative contexts. There is a major difference in both time periods. In Early Modern English, adverbial support functions statistically differently for resultatives and experientials, but that difference collapses in the Canadian English sample. Both this and the other linguistic contexts support a different analysis for each set of data with respect to adverbial independence from the meaning of the present perfect form.

Finally, this study represents a unique approach to tense and aspect from a variationist perspective. Much of the previous variationist literature on the present perfect in English (Tagliamonte,

1997, 2013; van Herk, 2008,2010; Davydova, 2011) treats the marking of aspect in a black box manner where independent overt indications of meaning (e.g. adverbs) are assumed to be indications of meaning of the co-occurring form. In Early Modern English, the present perfect form itself seems to have been less specified where adverbs performed a large role in creating what we identify in modern English as present perfect readings. In our Canadian English data, the present perfect form itself seems to have a more grammaticalized reading where adverbial modification does not do as much work to create the experiential and resultative readings, but is more strongly associated with the continuative reading. It is only by examining the co-occurrence of the present perfect with and without adverbial specification that these findings were uncovered using an accountable quantitative analysis.

6.1.1 The Future of Adverbs and the Present Perfect.

The present perfect aspect in English (and other languages) has a voluminous literature drawing on many frameworks and addressing multiple research programs. This dissertation has circumscribed a narrow research question on the relationship between adverbs and the present perfect form. There are several other research directions suggested by the approach in this work that could perhaps shed light on the broader present perfect function in varieties of English. First, each lexical adverb has been assumed stable for this work, but we did not address possible changes in the adverbs themselves. For example, *this* + TIME) which appeared highly frequently with the present perfect in our Early Modern English data but has disappeared in our Modern Canadian English data, but how does each adverb change over the course of modern English and when does that interact with aspect? Secondly, we do not show how the exact same methodology would replicate on modern British and modern American varieties of English: is there more evidence of preterite incursion in American English and is Canadian English moving in that direction?

Much of the motivation of this work is to provide a clearer framework for circumscribing the present perfect within a variationist framework. The separation of experientials and resultatives from continuatives with respect to adverb modification strongly suggests that there are

two variable contexts underlying a function based approach. The lack of adverbial modification in experiential and resultative present perfect forms suggests that non-present perfect forms that obtain these readings through adverbial support alone might not be part of the same variable context. In order for this to be established, the same methodology used for the present perfect form here would have to be applied to the non-present perfect form of interest (most likely, the preterite) for both readings. It could be that the continuative reading itself is not one generated by the present perfect form itself, but is created through other items in the discourse. Moreover, this dissertation has shown that the appearance of adverbial support itself is a linguistic variable that can be used to disentangle meaning from a verbal form itself and contributes to the broader variationist study of tense, mood and aspect.

This dissertation avoids an analysis of the development of particular lexical adverbs (i.e. already, yet, etc.) that are discussed in much of the literature in order to address the broader issues of adverbial modification as a linguistic variable. There are descriptive (McCoard, 1978) and semantic accounts (e.g. Michaelis, 1992;1996) whose claims might be able to be assessed with our data. The paucity of the total number of each lexical adverb that occurs is problematic in a quantitative study. For example, already occurs with the present perfect form 8 times in the Early Modern English data and 5 times in the Canadian English data. Future studies of individual lexical adverbs might include examining the development of tense alternation with each of these adverbs.

Finally, we do not know how the exact same methodology would replicate on modern British and modern American varieties of English: is there evidence of preterite encroachment in American English and is Canadian English moving in that direction? Menner (1926: 238) claims that the preterite can obtain a meaning that is indistinguishable from the present perfect in spoken (American) English. Later, Vanneck (1958) goes further and claims that the preterite is encroaching on the present perfect's function in vernacular American English. More recent semantic accounts make a similar argument for English more broadly. Mittwoch (2008) and Schaden(2009) argue that the present perfect competes with the preterite in simple past. Schaden (2009) concludes "*I think that nobody would deny that there are at least some contexts in which one can chose more or*

less freely between a simple past tense and a present perfect tense. Yet, in other contexts, one has to chose one form rather than the other.” For Canadian English, from our data, it is evident that adverbial support is unnecessary to obtain resultative and experiential readings. Do these same class of adverbs demonstrate the same conditioning, however, with the preterite form? It is difficult to address the issue of the encroachment of the preterite on the present perfect function with isolated examples or descriptive accounts of a variety of English. For example, the oft-quoted, *I already ate the apple*, could obtain the present perfect perfect resultative reading through adverbial support alone as a development of *already* independent of the semantics of the underlying preterite in English. In order to demonstrate within a variationist framework that the preterite form has in fact acquired this meaning in any variety of English we would need to show that the preterite form without adverbial modification (e.g. *I ate the apple*) also can obtain the present perfect reading.

6.2 Canadian English and the Perfect

If we return to the adverb modification rates across varieties of English Davydova (2011) across data from the International Corpus of English with the US data from Hundt & Smith’s (2009) study of the BROWN and FROWN corpora, reproduced in Table 39. Canadian English and Early Modern English have been added from our study. For both additional rows, the overall rates are higher than reported for the other varieties of English. This could be indicative of a difference in the linguistic conditioning or perhaps the uneven distribution of linguistic contexts in the data sets. The latter is more likely given that in our two data sets where the overall adverb modification rates are similar (a 4% difference), there are very different linguistic constraints operating in both. A tentative conclusion in the sharp decrease for all varieties from the Early Modern English might be the advanced grammaticalization in the other varieties of English. This conclusion, however, is moderated by the lack of knowledge, as stated, of the distribution of the linguistic contexts examined in our work.

Variety of English	Total Number of Present Perfects	% with Adverbial Marking
Indian English	182	15
East African English	247	23
Irish English	1283	25
British English	1812	26
Singaporean English	532	31
US English (Hundt and Smith, 2008)	1376	33
Canadian English	652	44
Early Modern English	629	40

Table 39: Percent Adverbial Support for Present Perfect across Varieties of English

6.3 Statistical Models

This dissertation has provided an important contribution to the current debate between Goldvarb and newer models. Logistic mixed effects models impose a number of additional assumptions on the data that sometimes fail to obtain (e.g. the number of speakers and tokens per speaker). Further, when the focus is not on social effects, but on the shared *grammar* of a community-it is not clear that logistic mixed effects are even appropriate. Comparing the factor weights generated across all three models for linguistic effects (something that no proponent of logistic mixed effects has done in any published work) yields differences that are readily explainable as differences for how each model handles unbalanced data. Further, both GLM logistic regression and logistic mixed effects models fail to account for the amount of tokens in each context in estimating a factor weight which might explain some of the differences seen in chapter 6's results.

Contra one of Paolillo's (2013) conclusions that the software is separate from the statistical model, I demonstrate here that the model and the implementation of its algorithm are inextricably linked. While we can discuss the statistical model separate from its implementation, the implementation imposes its own set of restrictions and assumptions on the estimation of the model. Furthermore, Goldvarb's implementation of the logistic model provide its own set of benefits as well as drawbacks that derive from both the model and its implementation. As discussed in chapter 5, using subjects as a fixed-effect (i.e. as simply a factor group or coding cross product factor groups with speaker) is wholly advocated against by the statistical literature on this subject. By

using subjects as a fixed effect, the resulting estimates for all other factors become statistically unstable and thus, unreliable. Paolillo's main conclusion that speakers should be treated as a fixed effect rather than a random effect is substantively flawed from a statistical perspective.

The other major conclusions of Paolillo (2013), however, are supported by the findings of this dissertation. Logistic mixed-effects models impose their own set of assumptions that must be acknowledged and accounted for. If there are small amounts of speakers and small amounts of tokens per speaker, then logistic mixed-effects models are inappropriate. Paolillo reiterates the same warnings of Sankoff (1988) and Guy (1990) that statistical results cannot be substituted for scientific reasoning vis-à-vis the research design. It is unreasonable to draw conclusions from 10 speakers about demographic variables (sex, age, etc.) if you have a small number of speakers per cell regardless of which model you use. A statistical model and its implementation do not overcome the problems in a bad research design or hypotheses that has not been well thought out. Moreover, whatever statistical program you use, a set of data put through an estimation algorithm will produce, many times, statistical output and results independent of the quality of the design or hypotheses. The hypotheses and design have to be assessed independently of the results produced.

6.3.1 Furthering Statistics in Sociolinguistics

The statistical results here suggest some pathways forward for sociolinguistic statistics. Logistic mixed effects have been called into question as a default tool for sociolinguistic analysis outside a narrow set of constraints (when the data is large enough and the unbalanced nature is not an issue, etc.), but how can sociolinguistics incorporate more broader statistical models into the already existing analytic framework. In other words, how can we incorporate standard error estimates into the notion of constraint hierarchies? Many times when newer statistical models are advocated in the literature, no mention is made of how the statistical model itself can be integrated into the *analytic* methodology of sociolinguistics. The analytic methodology includes the constraint hierarchy and ordering of constraints as well as range, or magnitude of effect. If sociolinguists want to start using newer models, surely they do not have to give up the analytic methodology that has been developed

over the last forty years to do so.

Each new model proposed, hopefully, will be assessed with a similar methodology presented here (i.e. how does it compare with already established approaches and how can we infer a constraint hierarchy from its results?). Every model presented here has been explained with regard to not only its underlying technical assumptions, but also how these assumptions interact with the technical implementations. Further, the practical limitations of statistical programs such as R, SPSS and SAS to handle the slash-operator need to be addressed. There are a number of linguistic variables where it is reasonable that a level be excluded from the analysis of one factor, but those tokens should not be excluded from the analysis of other groups. Since most statistical programs use algorithms that are based on models which assume no missing data, if there are missing data in a token, the entire token is excluded from the analysis¹. Proponents of newer models over the IPF algorithm implemented by Goldvarb have failed to fully vet their *innovative* approaches with the same careful methodological approaches used by the developers of the varbrul series of programs. There are certainly cases and research questions that would benefit from several statistical approaches, but the limitations of the model proposed or used must be established before incorporating a whole new approach.

6.4 Summary

In brief, the main contributions of this work are to the broader study of the present perfect and adverbs within a variationist framework and to sociolinguistic statistics. The results strongly suggest that while in Early Modern English the present perfect had not fully grammaticalized the resultative and experiential readings in Canadian English those readings are now intrinsic to the present perfect in modern Canadian English. Continuatives in both periods seem to strongly correlate with the appearance of adverbs with it approaching a categorical effect in Canadian English. The con-

¹More recently, if there is missing data, you have the possibility to estimate what is missing via techniques that impute missing values. This imputation usually involves analysing the mathematical structure of the data you do have and guessing values for the missing data with complex algorithms using that same structure.

ditioning of the concomitant weaker linguistic effects also reinforce these different conclusions in both periods. Our examination of several statistical models currently debated in sociolinguistics with our data show that there are several advantages to the Goldvarb program over newer models in the analysis of linguistic constraints. The newer models overestimate the linguistic effects and provide statistically biased results that inflate the magnitude of certain effects, making them appear stronger than they actually are. When the focus of the research question is on the linguistic system and not the social effects, Goldvarb in fact seems to perform better than the newer models.

Appendix A

SAS Code

This is all of the SAS code used to perform the statistical analysis in this thesis.

```
1 PROC IMPORT OUT= WORK.modern
2     DATAFILE= "C:\Users\Joe\Dropbox\New Thesis\data\modEData.csv"
3     DBMS=CSV REPLACE;
4     GETNAMES=YES;
5     DATAROW=2;
6 RUN;
7
8 PROC IMPORT OUT= WORK.early
9     DATAFILE= "C:\Users\Joe\Dropbox\New Thesis\data\EModEData.csv"
10    DBMS=CSV REPLACE;
11    GETNAMES=YES;
12    DATAROW=2;
13 RUN;
14
15
16 data CanadianEng;
17 set modern;
18 if function = "ambiguous" then delete;
19 if negation = "seminegative" then negation= "positive";
20 *if telicity = "\" then delete;
21 if voice = "Passive" then vundler="state";
22 else if telicity = "atelic" and dynamicity = "stative" and durativity = "
    durative" then vundler = "state";
23 else if telicity = "atelic" and dynamicity = "dynamic" and durativity = "
    durative" then vundler = "activity";
24 else if telicity = "telic" and dynamicity = "dynamic" and durativity = "
    durative" then vundler = "accomplishment";
25 else if telicity = "telic" and dynamicity = "dynamic" and durativity = "
    punctual" then vundler = "achievement";
26 else if telicity = "telic" and dynamicity = "stative" and durativity = "
    durative" then vundler = "sls";
27 run;
```



```

28 quit;
29
30 data EModE;
31 set Early;
32 length vendlr $20;
33 if reading = "ambiguous" then delete;
34 *if negation = "semi-negative" then negation= "positive";
35 if telicity = "\" then delete;
36
37 if voice = "Passive" then vendlr="state";
38 else if telicity = "atelic" and dynamicity = "stative" and durativity = "
    durative" then vendlr = "state";
39 else if telicity = "atelic" and dynamicity = "dynamic" and durativity = "
    durative" then vendlr = "activity";
40 else if telicity = "telic" and dynamicity = "dynamic" and durativity = "
    durative" then vendlr = "accomplishment";
41 else if telicity = "telic" and dynamicity = "dynamic" and durativity = "
    punctual" then vendlr = "achievement";
42 else if telicity = "telic" and dynamicity = "stative" and durativity = "
    durative" then vendlr = "sls";
43 run;
44 quit;
45
46
47
48 *ods tagsets.simplelatex file="C:\Users\Joe\Dropbox\New Thesis\tex\simple.tex"
    stylesheet="sas.sty"(url="sas");
49
50 *ods pdf file="C:\Users\Joe\Desktop\CndEng.pdf";
51 proc freq data=Canadianeng;
52 tables negation*Modification / nocol nopercnt;
53 tables clause*Modification / nocol nopercnt;
54 tables sentype*Modification / nocol nopercnt;
55 tables subject*Modification / nocol nopercnt;
56 tables voice*Modification / nocol nopercnt;
57 tables vendlr*Modification / nocol nopercnt;
58 table function*Modification / nocol nopercnt;
59 table Speaker*Modification / nocol nopercnt;
60 run;
61 quit;
62
63
64 proc freq data=Canadianeng;
65 table Speaker*Modification / nocol nopercnt;
66 run;
67 quit;
68
69
70 proc freq data=EModE;
71 tables negation*Modification / nocol nopercnt;
72 tables clausetype*Modification / nocol nopercnt;
73 tables subject*Modification / nocol nopercnt;
74 tables voice*Modification / nocol nopercnt;
75 tables vendlr*Modification / nocol nopercnt;

```

```

76 table reading*Modification / nocol nopercnt;
77 run;
78 quit;
79 /*
80  * Full Models for Early Modern and Canadian English GLM LR
81  * Stepwise Regression to Eliminate
82  *
83  */
84 proc logistic data=EMode;
85 class Modification reading vendler voice subject telicity dynamicity
      durativity negation clausetype / param=glm;
86 model Modification = reading voice negation / scale=none;
87 run;
88 quit;
89
90 proc logistic data=Canadianeng;
91 class Modification function vendler voice subject telicity dynamicity
      durativity negation clause / param=glm;
92 model Modification = function vendler voice subject negation clause / details
      selection=backward lackfit ;
93 run;
94 quit;
95
96
97 /*
98   Reduced Models for Early Modern English and Candian English
99 */
100
101
102 proc genmod data=Canadianeng;
103 class Modification function vendler voice subject telicity dynamicity
      durativity negation clause / param=glm;
104 model Modification = function subject negation / link=logit dist=b type3;
105 lsmeans function / diff;
106 run;
107 quit;
108
109 proc glimmix data=Canadianeng;
110 class Modification Speaker function vendler voice subject telicity dynamicity
      durativity negation clause /;
111 model Modification = function subject negation / link=logit dist=binary s
      htype=3;
112 *lsmeans function / diff;
113 random Speaker;
114 run;
115 quit;
116
117
118
119 ods tagsets.tablesonlylatex file="C:\Users\Joe\Dropbox\New Thesis\tex\NegCdn.
      tex" (notop nobot) newfile=table;
120 proc print data=NegCnd;
121 title ;
122 run;

```

```

123 ods tagsets.tablesonlylatex close;
124 run;
125 quit;
126
127
128 proc logistic data=modern;
129 class Modification function voice subject telicity dynamicity durativity
      negation clause;
130 model Modification = function telicity dynamicity durativity voice subject
      negation clause / lackfit;
131 run;
132 quit;
133
134
135 proc genmod data=Canadianeng;
136 class Modification function vendler voice subject telicity dynamicity
      durativity negation clause / param=glm;
137 model Modification = function vendler function voice subject negation clause /
      link=logit dist=b type3;
138 lsmeans function / diff;
139 run;
140 quit;
141
142 proc genmod data=EMode;
143 class Modification reading vendler voice subject telicity dynamicity
      durativity negation clausetype / param=glm;
144 model Modification = reading negation voice / link=logit dist=binary type3;
145 lsmeans reading / diff;
146 run;
147 quit;
148
149 *Reduced Model ;
150 proc genmod data=Canadianeng;
151 class Modification function vendler voice subject telicity dynamicity
      durativity negation clause / param=glm;
152 model Modification = function subject negation / link=logit dist=b type3;
153 *lsmeans function / diff;
154 run;
155 quit;
156
157
158
159 proc glimmix data=Canadianeng;
160 class Modification Speaker function vendler voice subject telicity dynamicity
      durativity negation clause /;
161 model Modification = function subject negation / link=logit dist=binary s
      htype=3;
162 random Speaker;
163 run;
164 quit;
165
166
167 proc freq data=early;
168 tables Modification*Negation / norow nopercnt;

```

```

169 run;
170 quit;
171
172
173 proc freq data=modern;
174 tables Modification*Voice / norow nopercent;
175 run;
176 quit;
177
178
179 proc freq data=early;
180 tables Modification*Voice / norow nopercent;
181 run;
182 quit;
183
184
185
186 proc genmod data=EMode;
187 class Modification reading vandler voice subject telicity dynamicity
      durativity negation clausetype / param=glm;
188 model Modification = reading negation clausetype / link=logit dist=b type3;
189 lsmeans reading negation clausetype / diff;
190 ods output Type3=t3;
191 run;
192 quit;
193
194 ods tagsets.tablesonlylatex file="C:\Users\Joe\Dropbox\New Thesis\tex\
      EModETable.tex" (notop nobot) newfile=table;
195 proc print data=t3;
196 title ;
197 run;
198 ods tagsets.tablesonlylatex close;
199 run;
200 quit;

```

Appendix B

R code

The R programming environment was used to generate all of the graphs in this thesis. All of the programming code is included below.

```
1
2
3 library(MASS)
4 setwd("C:/Users/Joe/Dropbox/New Thesis/data")
5
6 mod <- read.csv("ModernResults.csv",header=TRUE)
7
8 bdat <- t(mod[,2:4])
9 colnames(bdat) <- t(mod$label)
10
11
12
13 #png("C:/Users/Joe/Dropbox/New Thesis/tex/modernComp.png",width = 1024, height
    = 720,bg = "transparent")
14 pdf(file="C:/Users/Joe/Dropbox/New Thesis/tex/modernComp2.pdf",paper="USr",
    width = 11, height = 8.5)
15 b<-barplot(bdat,col=c("darkblue","deeppink4","red"),beside=T,ylim=c(0,1.0),
    cex.names=1.00)
16 legend("topright",c("Goldvarb","GLM LR","Mixed Effects"),col= c("darkblue","
    deeppink4","red")
17 ,pch=15,bty="n")
18 mtext(c("Reading","Grammatical Subject","Polarity"),side=1,line=2,at=c
    (10,28,41))
19 dev.off()
20
21
22 ##### Overall Comparison #####
23
24 label <- c("Candian English", "Early Modern English")
25 y <- c(45.4,40.2)
26
27 #png("C:/Users/Joe/Dropbox/New Thesis/tex/OverallDistribution.png",width =
    1024, height = 720,bg = "transparent")
28 pdf(file="C:/Users/Joe/Dropbox/New Thesis/tex/modernComp.pdf")
29 b<-barplot(y,col=c("darkblue","red"),beside=T,ylim=c(0,100.0), cex.names=1.00)
```

```

30 legend("topright",c("Canadian English", "Early Modern English"),col= c("
    darkblue", "red")
31 ,pch=15,bty="n")
32 #mtext(c("Canadian English","Early Modern English"),side=1,line=1,at=c(10,28))
33 dev.off()
34
35 ##### Reading #####
36
37
38 y1 <- c(12.4,19.1,91.2)
39 y2 <- c(27.4,16.8,71.2)
40 y <- rbind(y1,y2)
41 rownames(y)<- c("Early Modern English","Canadian English")
42 colnames(y) <- c("Resultative","Experiential","Continuative")
43
44 pdf("C:/Users/Joe/Dropbox/New Thesis/tex/readingComp.pdf")
45 #pdf(file="modernComp.pdf")
46 b<-barplot(y,col=c("darkblue","red"),beside=T,ylim=c(0,100.0), cex.names=1.00)
47 legend("topright",c("Early Modern English","Canadian English"),col= c("
    darkblue", "red")
48 ,pch=15,bty="n")
49 #mtext(c("Resultative","Experiential","Continuative"),side=1,line=2,at=c
    (10,15,20))
50 dev.off()
51
52
53 ##### Lexical Aspect #####
54
55
56 y1 <- c(40,62,14,39,7)
57 y2 <- c(59,47,42,38,20)
58 y <- rbind(y1,y2)
59 rownames(y)<- c("Early Modern English","Canadian English")
60 colnames(y) <- c("States","Stage LS","Act.","Accomp.","Achieve.")
61
62 pdf("C:/Users/Joe/Dropbox/New Thesis/tex/lexaspComp.pdf")
63 #pdf(file="modernComp.pdf")
64 b<-barplot(y,col=c("darkblue","red"),beside=T,ylim=c(0,100.0), cex.names=1.00)
65 legend("topright",c("Early Modern English","Canadian English"),col= c("
    darkblue", "red")
66 ,pch=15,bty="n")
67 #mtext(c("Resultative","Experiential","Continuative"),side=1,line=2,at=c
    (10,15,20))
68 dev.off()
69
70 ##### Negation #####
71
72
73 y1 <- c(39,76)
74 y2 <- c(46,44)
75 y <- rbind(y1,y2)
76 rownames(y)<- c("Early Modern English","Canadian English")
77 colnames(y) <- c("Positive","Negative")
78

```

```

79 pdf("C:/Users/Joe/Dropbox/New Thesis/tex/NegComp.pdf")
80 #pdf(file="modernComp.pdf")
81 b<-barplot(y,col=c("darkblue","red"),beside=T,ylim=c(0,100.0), cex.names=1.00)
82 legend("topright",c("Early Modern English","Canadian English"),col=c("
    darkblue","red")
83 ,pch=15,bty="n")
84 #mtext(c("Resultative","Experiential","Continuative"),side=1,line=2,at=c
    (10,15,20))
85 dev.off()
86
87 ##### Clause Type####
88
89
90 y1 <- c(42,37,27,46)
91 y2 <- c(49,33,39,39)
92 y <- rbind(y1,y2)
93 rownames(y)<- c("Early Modern English","Canadian English")
94 colnames(y) <- c("Main","Relative","Comp. ","Other Sub.")
95
96 pdf("C:/Users/Joe/Dropbox/New Thesis/tex/ClauseTypeComp.pdf")
97 #pdf(file="modernComp.pdf")
98 b<-barplot(y,col=c("darkblue","red"),beside=T,ylim=c(0,100.0), cex.names=1.00)
99 legend("topright",c("Early Modern English","Canadian English"),col=c("
    darkblue","red")
100 ,pch=15,bty="n")
101 #mtext(c("Resultative","Experiential","Continuative"),side=1,line=2,at=c
    (10,15,20))
102 dev.off()
103
104 ##### GRammatical Subject###
105
106 y1 <- c(47,30,27,44,36)
107 y2 <- c(51,45,11,51,28)
108 y <- rbind(y1,y2)
109 rownames(y)<- c("Early Modern English","Canadian English")
110 colnames(y) <- c("I","We","You","3rd","NP")
111
112 pdf("C:/Users/Joe/Dropbox/New Thesis/tex/SubjectComp.pdf")
113 #pdf(file="modernComp.pdf")
114 b<-barplot(y,col=c("darkblue","red"),beside=T,ylim=c(0,100.0), cex.names=1.00)
115 legend("topright",c("Early Modern English","Canadian English"),col=c("
    darkblue","red")
116 ,pch=15,bty="n")
117 #mtext(c("Resultative","Experiential","Continuative"),side=1,line=2,at=c
    (10,15,20))
118 dev.off()
119
120 ##### Voice Type####
121
122
123 y1 <- c(41,39)
124 y2 <- c(46,38)
125 y <- rbind(y1,y2)
126 rownames(y)<- c("Early Modern English","Canadian English")

```

```

127 colnames(y) <- c("Active", "Passive")
128
129 pdf("C:/Users/Joe/Dropbox/New Thesis/tex/VoiceComp.pdf")
130 #pdf(file="modernComp.pdf")
131 b<-barplot(y, col=c("darkblue", "red"), beside=T, ylim=c(0,100.0), cex.names=1.00)
132 legend("topright", c("Early Modern English", "Canadian English"), col= c("
    darkblue", "red")
133 ,pch=15, bty="n")
134 #mtext(c("Resultative", "Experiential", "Continuative"), side=1, line=2, at=c
    (10,15,20))
135 dev.off()
136
137
138 pdf("C:/Users/Joe/Dropbox/New Thesis/tex/logit.pdf")
139 curve(plogis(x), -6, 6, xaxt='n', ann=FALSE, lwd=2)
140 dev.off()

```


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