

Studies in the History of the English Language IV



Topics in English Linguistics

61

Editors

Elizabeth Closs Traugott
Bernd Kortmann

Mouton de Gruyter
Berlin · New York

Studies in the History of the English Language IV

Empirical and Analytical Advances
in the Study of English Language Change

Edited by

Susan M. Fitzmaurice
Donka Minkova

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Richard Hogg was the UK ambassador to the first SHEL meeting at UCLA in 2000. As the grand-marshal of the just finished 6-volume *Cambridge History of the English Language*, he brought the accumulated wisdom, good will, and best wishes of the ICEHL community to North America. Later he continued his enthusiastic involvement with the SHEL series as a presenter and reviewer, and only his sudden death in September 2007 stopped him from attending SHEL-5. As the invited commentator for the Old English section of the SHEL-4 collection he was characteristically prompt, incisive, and generous in supporting the enterprise.

We dedicate this volume to his memory with deep appreciation of his lasting contributions to our field, of his collegiality and friendship.

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Introduction: Heuristics and evidence in studying the history of the English language*

Susan Fitzmaurice and Donka Minkova

This volume continues the project of initiating and energizing the conversations among historians of the English language fostered by the series of conferences on studying the history of the English language (SHEL), begun in 2000 at UCLA. It follows in the footsteps of three high-profile SHEL-based collections of peer-reviewed research papers and point-counterpoint commentaries. In the current volume, we invited our contributors to reflect upon their approaches and practices in undertaking historical studies, focusing particularly on the methods deployed in selecting and analyzing data. The essays in this volume represent interests in the study of linguistic change in English that range across different periods, genres, and aspects of the language and show different approaches and use of evidence to deal with the subject. They also represent the current state of research in the field and the nature of the debates in which scholars and historians engage as regards the nature of the evidence adduced in the explanation of change and the robustness of heuristics.

We approach the history of the English language from different perspectives. One of us (DM) works on phonology, morphology, and meter, principally in Old and Middle English, while the other (SF) works on grammatical and semantic-pragmatic change, principally in seventeenth and eighteenth century English. Despite these different orientations, however, we share a strong interest in examining the evidence that informs and grounds research in our fields at the same time as interrogating the heuristics employed by our colleagues for the histories they present. The contributions to the volume give expression to these interests.

Our first contribution is an essay by SHEL-4 plenary speaker William Labov that explores the nature of what he calls ‘triggering events’. His principal concern is to identify the immediate ‘triggers’ of changes in vowel systems that tend to be represented as chain shifts. His empirical foundation rests both on historical sound changes in English and on data drawn from speakers whose dialects have provided the basis for the

detailed account of regional accents provided in the *Atlas of Northern American English* (ANAE). At issue in this article is the nature of ‘causes’ as opposed to triggers: the difference, in Labov’s view, is that “there are bends in the chain of causality at which triggering events are located. Around the bend there are further chains of causality, but they are often orthogonal to the question that drives the original search”. The “triggering events”, as we understand them, can be system-internal, driven by factors such as dispersion or functional load, and externally motivated. The paper demonstrates ANAE’s potential to reveal new relationships between ongoing sound changes and throw new light on the long-standing discussion of the distinction between “proximate mechanisms” and “causal explanations” (Minkova 1999), a central concern for historical linguists.

The rest of the volume is organized into four sections, partly along chronological lines, and partly following the topics of the contributions. For each section, we invited a colleague whose own work is related to the topics and approaches represented by the contributions to write an introduction to the papers. The result is interesting conversation within each section with quite different outcomes in terms of our contributors’ responses to the section introductions and the shape and interaction of the essays in that section.

Section 1 concerns developments in the study of Old English. In the last completed publication before his untimely death, Richard Hogg’s introduction poses the question, ‘What’s new in Old English studies?’ and finds much in the two studies in the section to help him ponder the answer and conclude optimistically that “[the contributions on Old English] create new avenues to explore and I hope that my own comments have suggested yet other avenues. Old English is alive and well.” For example, the availability of the *York-Toronto-Helsinki Parsed Corpus of Old English Prose* (YCOE) has significantly enhanced work on Old English syntax. Recent interest in the syntax-pragmatics interface, most especially with respect to information structure, led Elizabeth Traugott and Susan Pintzuk to address the challenge of building on the syntactically parsed corpus to make frequency counts of these factors possible. Their ultimate aim is to enable as detailed an account as is feasible of Old English information-structure, including the function, status, and frequency of clause-initial elements. Their more immediate purpose in their contribution is to discuss the method used in coding for information status and to exemplify some of the potentials of adding this kind of information. Their methodology builds on the notion of antecedence (Prince 1992, Birner and Ward 1998), which identifies referents that are “discourse-old” as opposed to “hearer-old” rather than just “given”. This

allows for a considerably more fine-grained account of Topicalization and Left-dislocation than has been used in the past, and paves the way for expanding the coding to other nominals and for further detailed comparisons of information structure not only with other stages of English but also with other dead languages available to us only through manuscripts.

The premise of Rob Fulk's paper "Anglian dialect features in Old English anonymous homiletic literature: A survey, with preliminary findings" is the observation that there is much disagreement and confusion about the cause of the admixture of seemingly Anglian dialect features frequently found in Late West Saxon prose. The phenomenon has been attributed alternately to diatopic variation within Wessex, stylistic considerations, and Anglian origins for the greater part of the corpus of late Old English prose (the last possibility perhaps having implications for the dating of the relevant texts). The stylistic explanation, which continues to hold considerable sway, is very plausible only in regard to homiletic works, in which the elevated tone associated with Anglian dialect characteristics would be appropriate. Homilies (including saints' legends), however, comprise most of the relevant corpus of late anonymous prose, and so uncertainty in regard to these texts is the greatest obstacle to explaining the phenomenon. As a preliminary step in the research required to resolve these issues, then, the corpus of anonymous homilies, amounting to about a quarter of a million words, is surveyed to determine the incidence and distribution of 54 distinctive Anglian (or non-West Saxon) features, including 26 items of vocabulary, and the results are presented for each of the nearly 150 texts. The results justify the preliminary conclusions that (1) reliable Anglian features are commoner in anonymous homilies than has generally been recognized, (2) their incidence shows considerable variability from one text to the next, and (3) features of different linguistic types (phonological/graphemic, morphological, syntactic, and lexical) invariably co-occur in texts that display more than a few Anglian characteristics. Settling the larger question about the cause of seeming dialect mixture will depend upon the close analysis of individual texts.

The three studies in **Section 2** bring the evidence from older verse into focus. Meter can be a friend or a foe; verse evidence is sometimes deliberately disregarded in syntactic reconstruction. Smith, Li, and Fitzgerald show how verse can be a friend in the undergraduate classroom, in scholarly debates about authorship, and in reconstructing language change. Thomas Cable surveys these contributions with a critical eye; his essay "The Elusive Progress of Prosodical Study" is an excellent example of how

problematic the area of English historical metrics can be. Here a well-established scholar takes issue with both the technical details and the larger conceptual problems in the work of younger scholars who inhabit a parallel theoretical universe. The field of English historical metrics is notoriously divisive, and Cable outlines clearly the historical demarcation between literary and generative prosodists; this in itself is a good lesson for the next generation of English historical metrists. Although the combative tone has gone from our exchanges and we do not start our statements with “I repeat regretfully, respectfully, but peremptorily and irrevocably, that it *is* impossible to argue with persons who say that ...” (Saintsbury 1923: 145, n.), the passions and sometime unbridgeable differences are still there. As volume editors, we take a detached stance; we believe that all four contributions in this section add much to our understanding of the interaction between meter, language, and literature. They offer insights into the advantages and the problems of developing new research methodologies in historical reconstruction. There is clearly both room and need for more work that will further and deepen our knowledge of the older verse traditions, their literary and linguistic settings, and their integration into linguistic theory.

Jennifer Smith’s paper “Fidelity in Versification: Modern English Translations of *Beowulf* and *Sir Gawain and the Green Knight*” attempts to assess the extent to which modern translators have been faithful in their reproduction of the elements of Old and Middle English alliterative verse. In place of the sense of holistic fidelity that most scholars use to evaluate translations of Old and Middle English verse, she adopts an approach comparing frequencies. Through the examination of six present day English translations of *Beowulf* and seven present day English translations of *Sir Gawain and the Green Knight* she is able to conduct an objective or independent assessment of the fidelity of one aspect of verse translation. Her method of analysis consists of measuring how much the scansion of the Modern English poetry violates or deviates from the Old and Middle English standards. She defines alliterating violations as failure to alliterate and alliteration in the wrong position; positional violations are defined as deviations from the four (or five) stressed line of alliterative verse. Ultimately, what she finds is that the attitude of the translators, their perspective on the text, what they see as most salient, be it the sound or the pacing, the alliteration or the epic themes, permeate the Modern English versions entirely. In exploring how modern translators have made choices in their own translations, she seeks to clarify some of the prosodic qualities of OE, ME, and ModE, as well as to contribute to the awareness that the collective power of

many translations are in and of themselves powerful forces of literary work both in their ability to mediate their source text and in their ability to revitalize linguistically inaccessible texts.

Xingzhong Li's study in this section re-examines the long-standing controversy about the authorship of the ME poem *The Romaunt of the Rose* translated from the original French poem the *Roman de la Rose*. Over a century, Chaucerian scholars have used a range of evidence of diction, rhyme, grammar of Chaucerian English, and other information in determining the authorship. The accepted view, dating back to 1900, has been that Chaucer translated only the first 1,705 of the 7,692 lines of the poem; this view has dominated the literature on *The Romaunt* authorship. Li's study adopts a comparative approach and exploits new and independent metrical evidence to test the authorship as well as the claims of earlier scholars. The findings strongly support the accepted view that Fragment A of the poem is by Chaucer while Fragment B is not, but they disagree with the centennial hypothesis on the authenticity of Fragment C.

In the fourth study involving metrical evidence, Christina Fitzgerald tackles the question of when Middle English *-es*, *-ed*, and *-ede* ceased to be syllabic. Following G. V. Smithers' (1983) study of scansion and the use of ME *-en* and *-e* in *Havelok the Dane*, Fitzgerald uses scansion of the same early fourteenth century poem – a text with authorial origins in Lincolnshire and soon after copied in Norfolk – to elicit information about the pronunciation of *-es*, *-ed*, and *-ede*. Her study is concerned with scansion and metrical stress as tools to unlock linguistic information rather than with reconstructing all of the prosodic features of the poet's language. Her analysis shows that 32.67% of regular and unambiguous metrical environments of *-es*, *-ed*, and *-ede* in the poem show syncopation. Though the pronunciation of inflectional endings outweighs their syncopation by a ratio of approximately 3:2, the numbers make it clear that syncopation is by no means an infrequent or isolated phenomenon. Fitzgerald concludes that in the early fourteenth century East Midlands dialect of the *Havelok* poet, the inflectional endings *-es*, *-ed*, and *-ede* had begun to lose their syllabicity, though they could still be used for metrical purposes in alternating stress poetry.

Section 3 of the volume represents the diversity of current approaches to morphosyntactic change in English. David Denison's introduction "Patterns and Productivity" explores how the three contributions approach the question of the patterns that speakers draw upon in lexical and morphosyntactic innovation, assessing the relative productivity of particular patterns.

His essay raises important questions about the extent to which researchers can make reasonable inferences about patterns on the basis of different kinds of evidence – from the immensely rich source of the internet to the surviving records of small groups of speakers in particular historical periods to selected examples from the Old English corpus. The three essays themselves adopt rather different perspectives to this question. The methods adopted by the group are more speculative in some respects than they are analytical – Chapman in terms of treating the internet as an open-ended corpus, Palmer in terms of extrapolating from a very small dataset, and Trousdale in terms of being truly speculative. Denison's essay provides an insightful and energetic critique of their effectiveness and their differences.

Chris C. Palmer's paper "Borrowed Derivational Morphology in Late Middle English: A Study of the Records of the London Grocers and Goldsmiths" seeks to characterize the morphological status of several derivational suffixes borrowed from French and Latin within the records of two communities in the fifteenth century. It compares the use of native nominal affixes (*-ness*, *-ship*, and *-hood*) with borrowed, potential affixes (*-cion*, *-ance*, *-ity*, *-age*, and *-ment*) throughout the English portions of these multilingual texts. Attempting to locate evidence of the naturalization of these forms – the process by which these endings become derivational morphemes in the general English lexicon – Palmer develops the notion of *local productivity*. This measure combines both quantitative and qualitative data to show that, even in smaller corpora, historical linguists can find evidence of the morphological status of different potential affixes for communities within particular historical moments. Palmer finds that despite variation in the use of *-age* between the two communities the majority of borrowed potential affixes were in the early stages of naturalization. They had limited productivity within a restricted subset of the lexis, and speakers were beginning to see them as individual units. Ultimately, Palmer argues that diachronic studies should consider such data to better understand the social and linguistic mechanisms that may have led to the increasing productivity of borrowed derivational affixes in the English language.

The *-er* suffix has been one of the most productive derivational suffixes in English, regularly forming nominalizations of verbs like *farmer*, *teacher* and *writer*. The verb + particle construction, like *wake up* or *find out* has also been long established in English. But the combination of these two constructions, that is the *-er* suffixation of a verb + particle construction has not been as well established. There are four possibilities, namely patterns like *on-looker*, *looker-on*, *looker-onner*, and *look-onner*, and in his study

“Fixer-uppers and passers-by: Nominalization of verb-particle constructions”, Don Chapman examines the distribution of each of these in the history of English. This sort of examination is difficult to conduct using standard corpora because these nominalizations retain an *ad hoc* or ludic feel to them and rarely show up in published writings. The *Oxford English Dictionary* (OED) and the internet present two tools for finding less established constructions like this one. The results of examining the distribution of these nominalizations in the OED are that the pattern *looker-on* has been the most widely used, followed by the pattern *on-looker*. Both however dip sharply in the twentieth century, the same century that the pattern *looker-onner* began to appear. The results of Chapman’s internet search confirm the trend of the twentieth century in the OED, namely that *looker-onner* has increased in usage while *on-looker* and *looker-on* have decreased. He observes that *looker-onner* appears to be the most productive form by far, but *looker-on* continues to be used, while *on-looker* has become only minimally productive. The form that did not occur in the OED, *look-onner*, is used as much as *looker-on* in the internet searches. Chapman speculates that if this represents a trend, perhaps one day *look-onner* will supplant *looker-onner*. This trend would present a progression of *looker-on* > *looker-onner* > *look onner*, such that the suffix gradually moves from the verb where it properly belongs to the end of the term, where suffixes usually go, with an intermediate stage in which the suffix occurs in both positions.

Graeme Trousdale’s article “Words and constructions in grammaticalization: the end of the English impersonal construction” is concerned with the remnants of the impersonal construction in early Modern English, and specifically with the role of grammaticalization in the development of both this construction and the transitive construction in English. An informative outline of the history of the impersonal construction up to and including the early Modern period is followed by a discussion of impersonal and transitive constructions using some of the theoretical apparatus from cognitive linguistics in general, and Cognitive Grammar in particular. Finally, he accounts for the change in terms of patterns of grammaticalization, developing some of the arguments of Meillet (1958 [1912]) whose work is traditionally cited in discussions of the grammaticalization of lexical items, but who in fact also considered changes in word order and phrase structure as potential instances of grammaticalization. The article proposes that constructional accounts of language structure can both inform and be informed by grammaticalization theory.

Section 4 concludes the volume. In this section, three authors provide different perspectives on aspects of variation in late modern English (LModE). The title of Joan Beal's introduction "Variation in Late Modern English: making the best use of 'bad data'" echoes Roger Lass' (1990) famous "How to do things with junk". She provides a cogent research context for examining the complex question of how to extract answers from evidence that is scanty and holey. The papers by Eble and Dollinger point up the problem very clearly as they deal with varieties of English that have not been studied from a sociohistorical perspective. In contrast, Hickey scrutinizes the evidence for assessing the extent to which the pronouncements of an influential commentator such as Sheridan might shape language history.

Connie Eble's essay "English/French bilingualism in nineteenth-century Louisiana: A social network analysis" applies the notion of social network to an archive of family papers to explore why French disappeared as the language of public life in northwestern Louisiana by the time of the Civil War. The social network itself and the language practices of a cohesive group of white creoles living in rural Natchitoches Parish during the nineteenth century are inferred from the writings preserved in the *Prudhomme Family Papers*. For a half century, dense and strong ties of kinship preserved French as the language of the descendants of the founder population, while restricting it increasingly to the domains of personal life and religious practice. At the same time, weaker connections favoured the addition of English for communication outside the creole network that aided economic prosperity. Sending members of the younger generation beyond the local area to learn to speak, read, and write English made knowledge of English a property of their ties to each other and made them conduits of linguistic change to their creole network. Eble finds that by the beginning of the twentieth century, French had disappeared entirely from the *Prudhomme Family Papers* and presumably from the lives of the creole network of the area.

Stefan Dollinger asks provocatively: "Progressive colonial English?" The paper deals with a 'bad' data problem specific to colonial Englishes in the Late Modern English period. Considering the complex sociolinguistic situation of newly-formed colonial varieties in the LModE period, Dollinger argues, in light of the present suboptimal resources, for the adoption of heuristic methods of approximation, of 'good-enough' estimates that have proved useful in other disciplines. These methods may provide a feasible shortcut for English historical linguistics in general, but particularly for the

characterization of colonial varieties. The approach is illustrated by the semantic development of CAN and MAY in Ontario English in terms of their progressive, respectively conservative, behaviour in comparison to British English, before being applied to a larger set of modal auxiliaries. In the LModE colonial context, the limitations of statistical testing are discussed and a solution is suggested by combining LModE findings, based on limited data, with twentieth-century findings on the modal auxiliaries, which allows the assessment of features of colonial varieties with a certain degree of confidence.

Raymond Hickey's paper "'What strikes the ear': Thomas Sheridan and regional pronunciation" concludes the volume. The study turns our attention to the contemporary description of late modern English by considering the role of the elocutionist and grammarian Thomas Sheridan in the rise of sociolinguistic censure. He examines Sheridan's attitude to non-standard features in both southeastern British English and Irish English in the late eighteenth century to track how prescriptive notions of language use seemed to be fleshed out during this time. He looks in some detail at what present researchers might glean about the nature of regional pronunciations in the late modern period from Sheridan's negative comments on the speech of his fellow Irishmen. Finally, he also considers the possible influence of Sheridan's strictures on the development of Irish English during the nineteenth-century.

We close with acknowledgments and thanks to the individuals and organizations that helped the progress of the conversations captured in this volume. The expertise of our reviewers (named in the *Tabula Laudatoria*) informed the work performed by new and established scholars alike in developing their contributions.

Notes

- * The term *heuristics* is understood in different ways in humanities. In our understanding, heuristics refers to methods of discovery, which may include empirical, analytical and speculative methods.

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Triggering events

William Labov

There is general agreement that the heart of the study of language change is the search for causes.¹ It is what we generally mean by the explanation of change. And while we would like to apply to this search the universal principles that govern grammar as a whole, it is also understood, following Meillet (1921), that no universal principles can account for the sporadic course of change, in which particular changes begin and end at a given time in history. The actuation problem (Weinreich, Labov and Herzog 1968) demands that we search for universals in particulars.

However, the pursuit of the causes of any given change might on further reflection involve us in an unsatisfactory and endless recursion. It goes without saying that any given state of a language is the outcome of a previous state of that language, and so on backward in time as far into the past as our knowledge can carry us. The title of this chapter then needs some justification if it refers to linguistic events. In such an endless chain of causes, every state of the language is a triggering event for the one that follows. Even if there is no change in a given system, it has a cause: the state of equilibrium that was reached in the preceding period. And when there is change, as Martinet (1955) has argued, the evolving system reflects a series of earlier readjustments that spiral backward in time.

I would like to defend the concept of “triggering event” by arguing that this sequence of preceding causes is not a smooth and uniform sequence. Rather, there are bends in the chain of causality at which triggering events are located. Around the bend there are further chains of causality, but they are often orthogonal to the question that drives the original search (Figure 1). A nonlinguistic example may illustrate the point. We are all interested in the pre-history that gave rise to mammalian evolution, and in this causal sequence we encounter the extinction at the K-T boundary between the Cretaceous and Tertiary periods of the dinosaurs, along with plesiosaurs, mosasaurs, and a majority of all other existing families. What caused this massive extinction? The most strongly supported theory is that of Luis

and Walter Alvarez, originally proposed in the 1980s: that the K-T extinction was the result of the impact of a large meteor with the earth.

While the exact killing mechanisms may or may not yet have been identified, all the data – including the rate of extinction, the nature of the recovery, and the patterns of survivorship – are concordant with the hypothesis of extinction by asteroid impact. (Fastovsky and Sheehan 2004).

What were the causes of this intersection of asteroid and earth? It is an important question for the future of the human race, which would be profoundly influenced by a major impact of this kind. The answer would involve calculations of celestial mechanics that are not immediately relevant to the later history of biological evolution. The hypothesis of a meteor impact, if it continues to be supported, provides a satisfactory answer to the question, what was the triggering event that gave rise to mammalian predominance in the evolutionary sequence? The linguistic triggering event that we are looking for may also be the result of a variety of factors concatenated by historical accident.

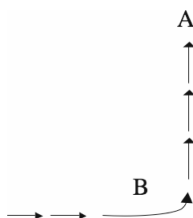


Figure 1. A bend in the chain of causality

Chain shifts are a natural subject for the study of causal sequences, and the search for triggering events. Table 1 lists six chain shifts studied in the *Atlas of North American English* (Labov, Ash and Boberg 2006; henceforth ANAE). The most recent events are listed on the right, and the events preceding them in the two columns on the left. Some shifts link two or three events, one shows five. In each case we are led to ask, what was the triggering event that was responsible for this shift?

We might think, again following Martinet, that this triggering event must be an external event impinging on the linguistic process, like the Norman invasion or World War II, outside of the realm of autonomous linguistic explanation. For some shifts, this is the case.² But in others, it will

Table 1. Six chain shifts described in ANAE.

	<i>Entering</i> →	<i>Leaving</i> →
The Canadian Shift (Ch. 15)	/e/ → /æ/ → /o/ →	
The Pittsburgh Shift (Ch. 19)	/ʌ/ → /o/ →	
The Northern Cities Shift (Ch. 14)	/e/ → /ʌ/ → /oh/ → /o/ → /æ/ →	
The Southern Shift (Ch. 18)	/iy/ → /ey/ → /ay/ → /ah/	
The Back Uplide Shift (Ch. 18)	/ɔw/ → /aw/ →	
Back Chain Shift before /r/ (Ch. 19)	/ahr/ → /ohr/ →	

appear that there are linguistic bends in the chain of causality. I will argue that there are triggering events of a purely linguistic character. Their explanation calls upon a different set of principles than those that operate on the changes they initiate.

First however I'd like to show that bends in the linguistic chain are essential characteristics of chain shifts. In fact, without such shifts of direction it will be difficult to defend the very concept of a chain shift.

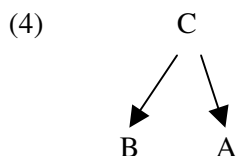
Consider the simplest kind of chain shift

(1) B → A →

A is the *leaving* element and B is the *entering* element following the notation of Table 1.³ A causal connection might be said to exist if A moves away because B approached A, reducing the margin of security, or if A moved away, increasing the margin of security, and B consequently moved in the direction of A. However, such chain shift events are subject to an alternative interpretation. The movement of A may be generalized to B, just as the change of a front vowel may be generalized to the corresponding back vowel without any relevant change in margins of security. In (2), if A is a vowel /e/ moving in the vowel space from mid to high, and B is a low vowel /æ/ that moves from low to mid behind it, one could argue that the movements of A and B are causally related. But this can also be conceived as a single expression (3) in which all front vowels undergo a loss of one

degree of openness. Thus whatever factor C acted on /e/ to make it less open came to act equally on /æ/ so that the causal relationship is seen as (4) rather than (1).

- [illegible]



Option (4) is not available if A and B are different kinds of linguistic processes. Thus in the Southern Shift, A is the monophthongization of /ay/ and B is the lowering and centralization of the nucleus of /ey/ (ANAE: Ch. 18), as represented in (5). In A, /ay/ is a vowel from the subsystem of front upgliding vowels that moves to the system of long and ingliding vowels, while B is an adjustment entirely within the set of front upgliding vowels.

- (5) A ay $\rightarrow$ ah⁴
 B ey $\rightarrow$ ay

Here we must accept a chain shift of type (1) since there is no single process that can be generalized to unite the behavior of A and B. The causal relationship seems clear: the removal of /ay/ from the front upgliding system led to a readjustment by the well recognized principle of maximal dispersion – the tendency of vowels to achieve equidistant positions within a subsystem (Martinet 1955, Liljencrants and Lindblom 1972, Disner 1980, Lindblom 1988). Figure 2 sums up the characterization of these two situations: generalizable shifts within a subsystem, and sequential shifts across subsystems.

The type of causal explanation applied to chain shifts is not in question here. In this search for triggering events, one may take a teleological posi-

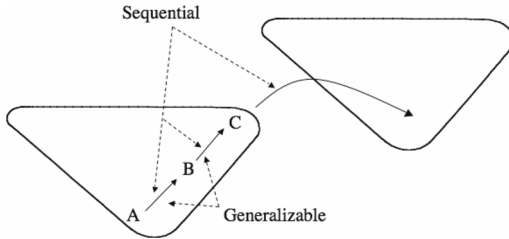


Figure 2. Generalizable and sequential chain shifts across subsystems.

tion, like Martinet (1955) or Jakobson (1972), and argue that speakers shift their vowels to minimize misunderstanding. Or one can attribute these linked movements to the mechanical effects of misunderstanding on the probability matching of the language learner (Labov 1994, Ch. 20). Evidence for the causal link may come from temporal sequencing, geographic nesting, or internal correlation (ANAE Chs. 14, 18). However, the order of events is crucial to the present discussion: whether we are dealing with a drag chain or a push chain will be decisive in the search for triggering events.

Subsystems of English vowels. Much of the logic of chain shifting involves movements out of and into subsystems. The binary notation of ANAE Ch. 2, is designed to characterize these subsystems in a coherent and systematic manner. Table 2 shows the four subsystems of North American English: short vowels, front upgliding vowels, back upgliding vowels, and the smaller set of long and ingliding vowels.⁵ In r-pronouncing dialects, this fourth subset consists primarily of the /ah/ class in *father*, *ma*, *pa*, *pajama*, etc., and /oh/ in *law*, *talk*, *off*, *cloth*, etc. In r-less dialects, the marginal members of this subset /ih/, /eh/, /uh/ are greatly expanded to include *beer*, *bare*, *boor*, etc. The notation does not describe the set of contrasts in any one dialect, but rather the initial position from which present-day dialects can be derived. In that sense, the individual units are historical word classes comparable to the lexical key words presented in Wells (1982).⁶

The principles of maximal dispersion and maintenance of margins of security developed in Martinet (1955) operate within subsystems (see also Liljencrants and Lindblom 1972, Lindblom 1988). Labov (1994, Ch. 9) presented data from misunderstandings in spontaneous speech which show that confusions occur primarily within members of a subsystem, rather than across subsystems. There is for example more confusion between /i/ and /e/

than between /e/ and /ey/, and more between /ey/ and /ay/ than between /ay/ and /aw/.

Table 2. ANAE notation for four subsystems of vowels of North American English, with type words.

nucleus	SHORT		LONG					
			Upgliding				Ingliding	
			Front upgliding		Back upgliding			
	V		Vy		Vw		Vh	
	front	back	front	back	front	back	unrounded	rounded
high	/i/ <i>bit</i>	/u/ <i>put</i>	/iy/ <i>beat</i>		/iw/ <i>suit</i>	/uw/ <i>boot</i>		
mid	/e/ <i>bet</i>	/ʌ/ <i>but</i>	/ey/ <i>bait</i>	/oy/ <i>boy</i>		/ow/ <i>boat</i>		/oh/ <i>bought</i>
low	/æ/ <i>bat</i>	/o/ <i>cot</i>		/ay/ <i>bite</i>		/aw/ <i>bout</i>	/ah/ <i>balm</i>	

1. The Canadian Shift

The first of the North American chain shifts in Table 1 is the Canadian Shift as in (6).

(6) /e/ → /æ/ → /o/ →

This chain shift was first described by Clarke et al. in 1995 on the basis of word lists read by 16 college students, and has since been confirmed by several further studies of Canadian English (ANAE Ch.16; Boberg 2004). It is the most consistent marker of the Canadian English dialect in ANAE, and it is the basis for the isogloss defining the Canada region (including all points in Canada outside of the Atlantic Provinces). Figure 3 compares the Canada dialect region with the combined means for all others for the vowels involved in the shift. There is no notable difference for /i/. But the Canadian /e/ is significantly lower than the general mean, and an even greater difference appears for /æ/ in both F1 and F2. One can also observe that Canadian /o/ is well back of the general mean.

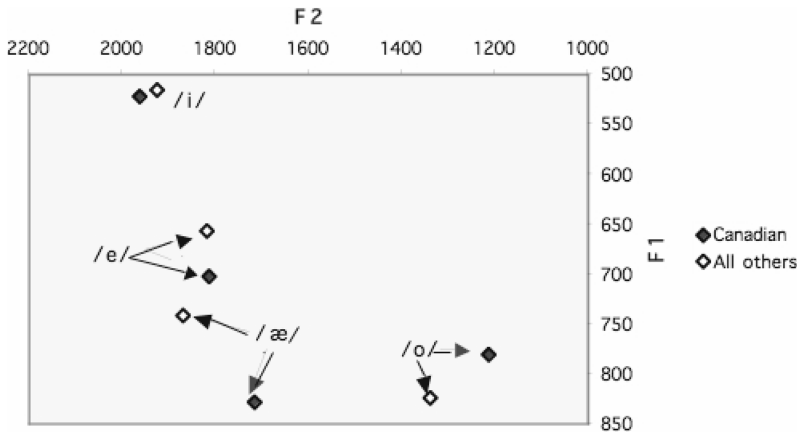


Figure 3. Mean values of vowels in the Canadian Shift for the Canada region [N = 25] and all other dialects combined [N = 414]. Source: ANAE Ch. 15]

It was clear from the outset that the Canadian shift of the short front vowels was a response to the low back merger of /o/ and /oh/ in *cot* and *caught*, *Don* and *dawn*, etc., well established in Canada. (6a) is therefore a more complete representation of the Canadian Shift. /oh/ is not a leaving element, but collapses with /o/.

(6a) /e/ → /æ/ → /o/ → /oh/

To which subsystem do we assign the collapsed vowel phonologically? The decision is dictated by phonological facts. While the original short-*o* was a checked vowel, which cannot occur in stressed word-final position, the merged vowel occurs in free as well as checked position: that is, the vowel of *cot* is now an allophone of the vowel of *caw*. Though both vowels may shift position in the course of the merger,⁷ it is /o/ that moves to the long and ingliding subsystem rather than /oh/ to the short subsystem. Figure 4 embeds the Canadian Shift in the acoustically defined phonological space characteristic of the Germanic language family, with a peripheral region enclosing a nonperipheral region.⁸ By the principles of chain shifting developed in Labov (1994, Ch. 5–6), tense or long vowel nuclei rise along the peripheral track and lax or short nuclei fall along the nonperipheral track. A shift from a short to a long subsystem appears as a movement from a nonperipheral to a peripheral track, as indicated in Figure 4. The remaining

short vowels then readjust their positions along the nonperipheral track to achieve maximal dispersion.

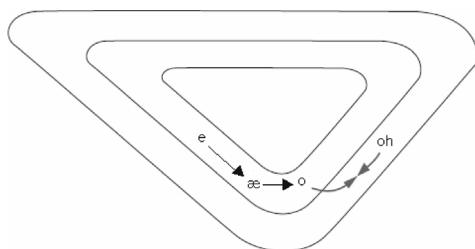


Figure 4. Shift of subsystems in the Canadian Shift

The temporal relations of the low back merger and the Canadian shift are consistent with the causal assignment to the merger as prior. As noted above, the first report of the shift of /e/ and /æ/ date from 1995. The low back merger in Canada was firmly documented well before then (Scargill and Warkentyne 1972, Gregg 1957). Chambers (1993: 11–12) cites literary sources for the merger in the middle of the 19th century.

The geographic distribution of the Canadian Shift and the low back merger are also consistent with the causal connection inferred; here we encounter the nesting relation that plays an important role in the application of dialect geography to historical sequencing. Figure 5 maps the distribution of ANAE subjects who satisfy the acoustic criteria for the Canadian Shift (grey symbols), and the isogloss that defines the region in which these symbols predominate. The homogeneity of this isogloss – the proportion of speakers within the area who satisfy the criteria – is .84. Twenty-one of the 25 Canadians within the isogloss do so, producing a more reliable definition of the Canadian dialect than Canadian raising, the best known stereotype of Canadian English (ANAE, Ch. 15). However, consistency – the proportion of speakers who show the trait who are within the isogloss – is quite low, since the same forces are operating wherever the low back merger is found. The implicational relation between the Canadian Shift and the low back merger is evident in that only three of the 60 speakers who show the Canadian Shift have /o/ and /oh/ distinct. The important geographic relation is that the Canadian Shift isogloss is strictly contained within the low back merger isogloss (the oriented line on Figure 5). The low back merger extends to a much wider territory, covering the West, Western Pennsylvania and Eastern New England. A total of 123 speakers

produced /o/ and /oh/ the same in minimal pair tests, and only 60 showed the back shifting of /e/ and /æ/. At the same time, the Canadian Shift does appear among a minority in other low back merger areas: twelve in the West, five in Western Pennsylvania, four in Texas, where the merger is reported in progress (Bailey et al. 1991); and seven in the Midland where the merger is generally in transition. However only two grey symbols appear within the dashed isoglosses: these outline the areas of greatest resistance to the merger: in the Inland North, the Mid-Atlantic States and the South.

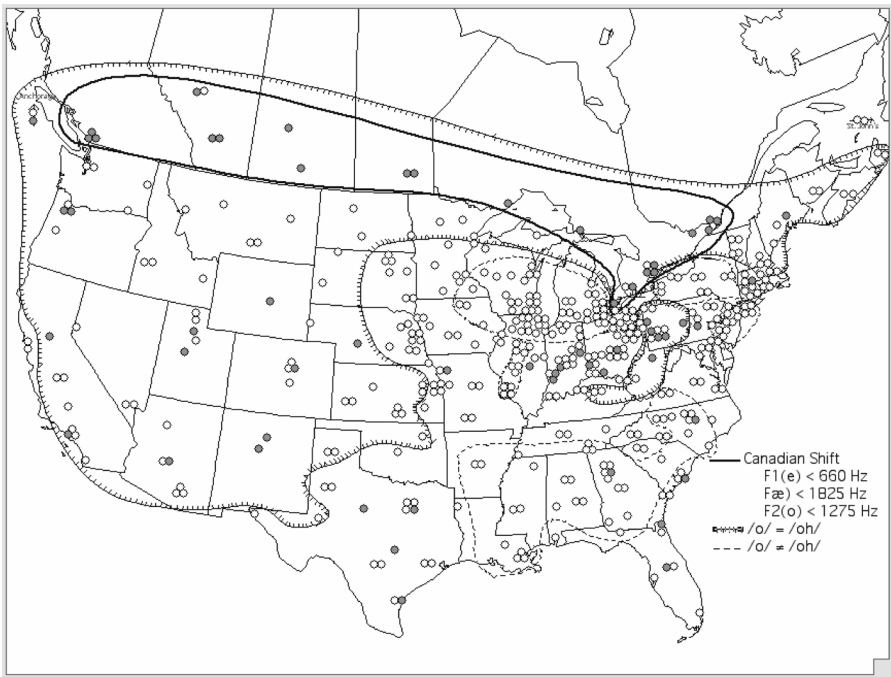


Figure 5. Nesting of Canadian Shift within the Low Back Merger isogloss

Both temporal and spatial evidence reinforce the general principles of chain shifting to indicate that the low back merger creates the conditions for the backing of /æ/ and accompanying backing and lowering of /e/. In removing /o/ from the subset of short vowels,⁹ it acts as the triggering event for the Canadian Shift.

2. The Pittsburgh Shift

ANAE reports for the first time a chain shift in the city of Pittsburgh, as indicated in (7). As in (6a), we add the third element /oh/, indicating the low back merger that is missing in Table 2.

(7) / Λ / $\rightarrow$ /o/ $\rightarrow$ /oh/

Figure 6 presents the Pittsburgh Shift in the same framework as Figure 4. The low back merger is solidly entrenched in Pittsburgh, as it is in Canada. But in Pittsburgh, the phoneme / Λ / moves downward on the nonperipheral track from mid, back of center position, while /æ/ remains in place in the low front area. Figure 7 provides a detailed view of this downward movement in the vowel system of a 35-year-old man from Pittsburgh, interviewed in 1996. On the left, the short-*a* vowels follow the nasal system: words with nasal codas are raised to mid and upper-mid position, while all others are in a tight cluster in low front position. In the back, /o/ is clearly merged with /oh/ in the same lower mid back position as in Canada. Between /æ/ and /o~/oh/ are located the majority of the tokens of / Λ /. Words with / Λ / before /n/ are particularly low (*sun, fun, months*), but the token of *duck* is regularly judged to be *dock* by speakers of other dialects. Figure 8 places this Pittsburgh development against the mean values of the low vowels of Canada and 18 other North American dialects.¹⁰ It can be seen that the mean /æ/ of Canada is the furthest back of all dialects, while Pittsburgh /æ/ is in normal low front, unraised position.¹¹ At right, both Canada and Pittsburgh show the merger of /o/ and /oh/ in lower mid back position (the two Canada tokens practically coincide). In the center, the Pittsburgh mean for / Λ / is much lower than any other dialect, not far from the general /o/ distribution.

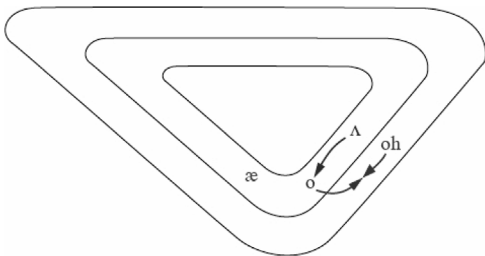


Figure 6. Shift of subsystems in the Pittsburgh Shift

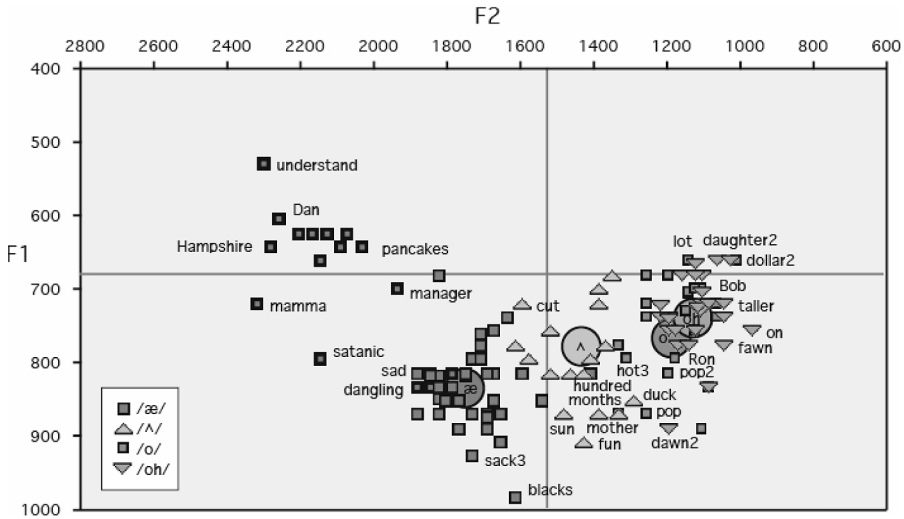


Figure 7. The Pittsburgh Shift in the vowel system of Kenneth K., 35 [1996], TS 545.

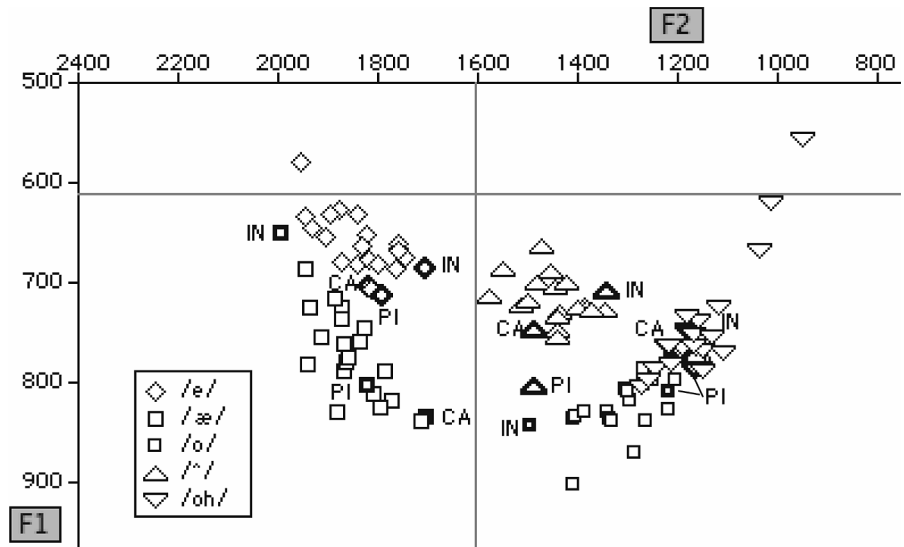


Figure 8. Mean positions of low vowels for 20 ANAE dialects, with Canadian Shift labeled for Canada [CA], Pittsburgh Shift labeled for Pittsburgh [PI] and Northern Cities Shift labeled for the Inland North [IN].

The low back merger is evidently the conditioning event for the Pittsburgh Shift, just as it is for the Canadian Shift. Here, however we have the same cause with two different effects. In the search for causes of linguistic change, it seems reasonable to expect that the same cause will have similar or comparable effects. Why is it that /ʌ/ instead of /æ/ moved into the empty space created by the back shift of /o/ and its merger with /oh/?

Among North American sound changes, there are other cases of two neighboring phonemes competing to fill the empty space in the pattern.¹² One might say that these are two equally likely possibilities, and it is a matter of chance which was realized. But these choices are not equiprobable: there are 60 communities which show evidence of the Canadian Shift and only one city with the Pittsburgh Shift.¹³ To account for the unique Pittsburgh development, it is not unreasonable to turn to the other unique feature of the Pittsburgh dialect: the monophthongization of /aw/. The Pittsburgh long monophthong in *down*, *town*, *south*, *out* and *house* is located in low central position, partially overlapping with /ʌ/. There is no danger of confusion between /ʌ/ and /aw/, however, since monophthongized /aw/ (now /ah/) has twice the length of /ʌ/, so that typically the longest /ʌ/ is shorter than the shortest /aw/ (ANAE p. 273). One hypothesis is that the lowering of /ʌ/ is the result of a change in the organization of the vowel system of Pittsburgh speakers in which /ʌ/ is re-analyzed as /a/, the short counterpart of /ah/. This would oppose the long and short pairs *down* ~ *dun*, *about* ~ *but*, *howl* ~ *hull* as /dahn ~ dan, əbaht ~ bat, hahl ~ hal/. If further evidence supports such an abstract re-analysis, then both the low back merger and the monophthongization of /aw/ appear to be triggering events for the Pittsburgh Shift. Both are movements of word classes into the long and ingliding subsystem from other subsystems.

3. Causes of the low back merger

Given our understanding of the effect of the low back merger on other linguistic events, the question that naturally arises is: what are the causes of the low back merger? Herold (1990, 1997) has provided a convincing social account of the actuation of the low back merger in Eastern Pennsylvania – the influx of large numbers of immigrants from Eastern Europe into coal-mining communities. However, no linguistic mechanism for a substratum effect has yet been staked out, and the inquiry we are conducting here calls for a much more general solution. We must account for the linguistic

antecedents of the collapse of /o/ and /oh/ in more than half of the North American continent with a variety of vowel systems, and in Scotland as well. Why then is the distinction between /o/ and /oh/ so likely to collapse? If there is a linguistic answer to this question, then the low back merger is not the triggering event we are looking for, but it is only a link in the causal chain.

A first thought about the cause of a merger is the functional load of the distinction. In the case of /o/ and /oh/, there is no problem in finding minimal pairs. We can generate sizeable numbers in the style of (8).

(8)	cot	caught	cock	caulk
	rot	wrought	tock	talk
	tot	taught	odd	awed
	sot	sought	nod	gnawed
	cotter	caught her	cod	cawed
	dotter	daughter	mod	Maud
	Don	dawn	sod	sawed
	yon	yawn	Sol	Saul
	pond	pawned	moll	maul
	fond	fawned	collar	caller
	hock	hawk	holler	hauler
	stock	stalk	odd ability	audibility

This proliferation of minimal pairs masks, however, the odd skewing in the distribution of /o/ and /oh/ that appears in Table 3. Almost all of the contrast between /o/ and /oh/ is before a set of five apical consonants /t,d,s,n,l/ and one non-apical /k/, as indicated by the bold lines. There is no contrast before labials or palatals. Occurrences of /o/ before /z/ are limited to special lexical items and words in which intervocalic /s/ is voiced. In the lower half of Table 3, there are six environments where /oh/ is not represented at all, and one – final position – where /o/ does not appear.

Three sets of /oh/ words in Table 3 are italicized. These are /o/ words that are tensed in American English before front voiceless fricatives and nasals, the same core phonetic conditioning that operates in the tensing of short-*a* in the Mid-Atlantic region and broad-*a* in Britain (Ferguson 1975, Labov 1989).¹⁴ This tensing process typically proceeds by lexical diffusion, but does not substantially increase contrast between /o/ and /oh/. There are a total of six environments in which one side or the other is represented by a small number of learned, colloquial or specialized vocabulary, so that in

twelve environments, contrast is marginal; monosyllabic and minimal pairs are not to be found.¹⁵

Table 3. ANAE notation for four subsystems of vowels of North American English, with type words.

/o/		/oh/
APICALS		
t	cot, tot, hot, got, dot	caught, bought, taut, fought
d	odd, hod, god, sod	awed, hawed, gaud, sawed
s	toss, moss, floss, cost, loss	sauce, exhaust, caustic
z	(Oz, positive)	cause, clause, hawser, pause, paws
n	don, Ron, pond	dawn, awn, yawn, lawn
l	doll, moll, collar	all, tall, maul, caller
NON-APICALS		
p	hop, pop, top, sop	-----
b	rob, hob	(daub, bauble)
č	Scotch, botch, watch	-----
j	lodge, dodge, Roger	-----
g	log, hog, cog, dog	(auger, augment, augur, August)
k	stock, hock, clock	stalk, hawk, talk
f	(boff, toff)	→ <i>off, doff, scoff</i> (cough, trough)
θ	(Goth)	→ <i>cloth, moth</i>
ʃ	(gosh, bosh)	(wash)
ð	(bother)	-----
ž	-----	-----
m	bomb, Tom, prom	-----
ŋ	(pong, Kong)	→ <i>strong, song, wrong, strong</i>
#	-----	law, saw, flaw, thaw, claw

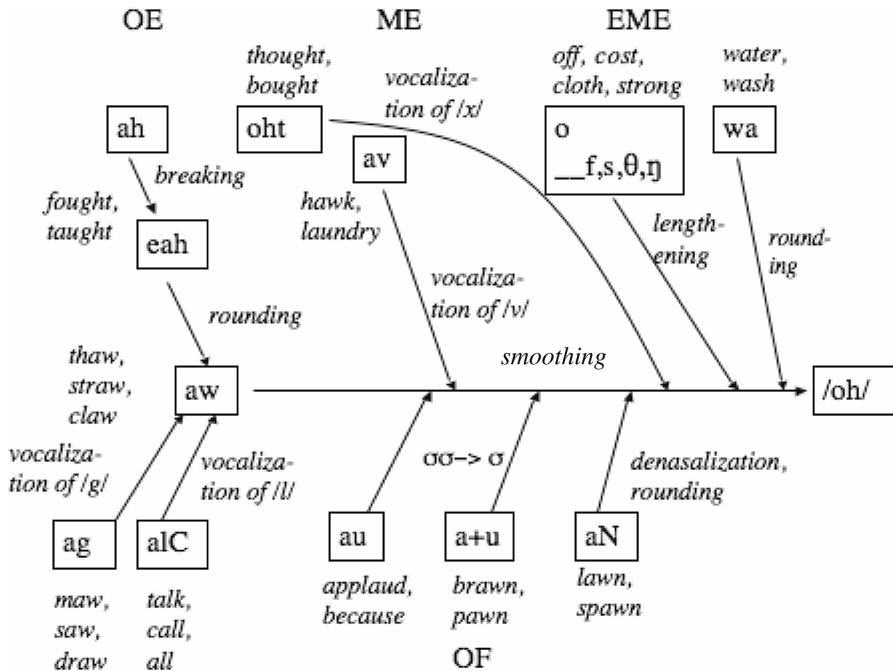


Figure 9. Historical development of the long open-o word class

In order to see how this bizarre distribution came about, it may be helpful to review the historical formation of this word class, as summarized schematically in Figure 9. Proceeding from left to right, the diagram shows

1. an original /aw/ diphthong in Old English (*thaw, straw, claw*)
2. additions to Old English /aw/ through Old English sound changes
 - a. breaking and rounding of strong verb preterits before velars in complex codas (*fought, taught*)
 - b. vocalization and rounding of /l/ in complex codas (*talk, call, all*)
 - c. vocalization of coda /g/ (*maw, saw, draw*)
3. additions to /aw/ in Middle English through vocalization of /v/ (*hawk, laundry*)

accretion of new /aw/ forms from Old French loan words

 - a. original OF back upgliding diphthongs (*applaud, because*)
 - b. collapse of bisyllabic /a + u/ words to single syllables (*pawn, brawn*)
 - c. denasalization and rounding of nasal vowels (*lawn, spawn*)
4. smoothing (monophthongization) of /aw/ to /oh/.

5. lengthening of /o/ to /oh/ in Early Modern English before voiceless fricatives and velar nasals (*cloth, off, loss, lost, strong, song, wrong, long*)
6. lexically irregular rounding of /a/ after /w/ (*water, warrant, walrus*)

The O.E. /aw/ class traced here is not a reflex of PGmc /aw/, which is realized in Old English as ēā. It was cobbled together by a series of conditioned sound changes so that its shape is a matter of historical accident. The general sound change that set the stage for the low back merger was the smoothing of ME /aw/ to /oh/.¹⁶ It must have taken place before the shift of Middle English /o/ to /oh/ by compensatory lengthening in *thought* and *brought*. We can also argue that it must have also preceded the completion of the Great Vowel Shift in the back vowels, by which ME u: diphthongized to /aw/. The smoothing of /aw/ created the juxtaposition of /o/ and /oh/ – two lower back mid vowels differentiated only by length,¹⁷ which is unstable on two counts. First, it is well established that length distinctions without accompanying differences in vowel quality tend to collapse, in English and many other languages (Chen and Wang 1975). Second is the asymmetrical distribution of Table 3. Given this situation, the merger of the opposition is a likely outcome unless qualitative differences develop to support it. Such qualitative differentiation of /o/ and /oh/ did develop in three areas outlined by the dotted isoglosses of Figure 5 (ANAE Ch. 11): (1) the unrounding and fronting of /o/ in Western New England and New York State;¹⁸ (2) the raising of /oh/ to upper mid position (east coast dialects from Providence to Baltimore); (3) restoration of the back upglide of /oh/ in the South.¹⁹ Outside of these areas, the low back merger is either complete or in transition. It follows that the juxtaposition of long and short open-*o* by the smoothing of /aw/ was the triggering event of the low back merger.

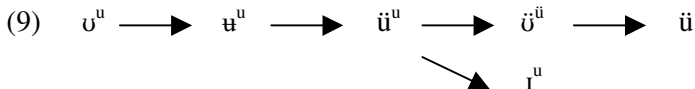
What is the relationship of the other events of Figure 9 to the low back merger? The /aw/ class originated in final position, where it could not contrast with short open /o/. The changes that followed were largely conditioned by the vocalization of /l, g, x/ in complex codas before /k/, /l/, /t/. They created the limited contrasts which resisted the merger to a certain extent; however, one would have to say that it was the absence of sound changes conditioned by other consonants that favored the merger.

If the smoothing of /aw/ was the triggering event for the low back merger and ultimately the Canadian Shift and the Pittsburgh Shift, we must ask if it in turn had a relevant predecessor. I argued that it must have pre-

ceded the completion of the Great Vowel Shift on the assumption that it was a drag chain. But it is also possible that a push chain was involved, and that the descending diphthong [ɔu] → [əu] → in *out*, *south*, *down*, etc. reduced the margin of security of /aw/ realized as [au] in a way that promoted the shift to [ɔ:]. If that is the case, we would have to push our inquiry into the triggering event of the Great Vowel Shift, a question that has been much discussed (Luick 1903, Martinet 1955, Stockwell and Minkova 1997). There is not enough evidence to pursue this connection here, except to emphasize the possibility of a chain of linguistic triggering events receding into the past. In any case, there is no reason to believe that any one external event intervened to produce these chain shifts.

4. The fronting of /uw/

In the two cases just studied, the low back merger was seen to set the conditions for subsequent changes in the vowel system, responding to the tendency of subsystems to maintain equidistant spacing or maximal dispersion. We will now consider a sound change that appears to be inconsistent with previous explanation based on these principles. This is the fronting of /uw/, an ongoing shift that covers 90% of the North American continent. The various phonetic forms involved are shown in (9).



Martinet (1955) advanced an explanation for what is now recognized as a general principle of chain shifting: that back vowels move to the front.²⁰ He argues that the repeated fronting of /u/ and /o/ is the result of the fact that even though there is a strong tendency to front-back symmetry in the vowel system, there is physically less room in the back than in the front. Such fronting is then the result of pressure to relieve overcrowding among the back vowels. Specifically, this happens when through one linguistic process or another, a vowel system develops four degrees of height among the back vowels. Haudricourt and Juilland (1949) applied this logic to a wide range of sound changes in western Europe and confirmed Martinet's prediction in every case. Labov (1991), defining three major dialects of English, argued that the third dialect, characterized by the low back merger, would be sta-

ble, and resist the fronting of /uw/ and /ow/ that is predominant in the South and the Midland.

Figure 10 shows that the completed ANAE data does not satisfy this expectation. The grey symbols identify speakers for whom /uw/ after coronal consonants – in *do*, *dew*, *too*, *two*, *soon*, *noon*, etc. – is front of center, that is, mean F2 is greater than the midpoint of 1550 Hz in this normalized system. This includes 89% of the population: there are only 49 of the 439 ANAE subjects for whom this is not the case. Furthermore, these 49 are concentrated in two narrowly circumscribed areas: New England and the Minnesota-Wisconsin. In general, Eastern New England is a conservative area in regard to the fronting of /uw/ and /ow/, and its behavior is consistent with what we would expect from the low back merger in that area. The Minnesota-Wisconsin area shows considerable variation in regard to the low back merger. But the conservative character of the vowel system, with back /uw/ and /ow/ often monophthongal, must be accounted for by a strong Scandinavian and German substratum (Allen 1973).

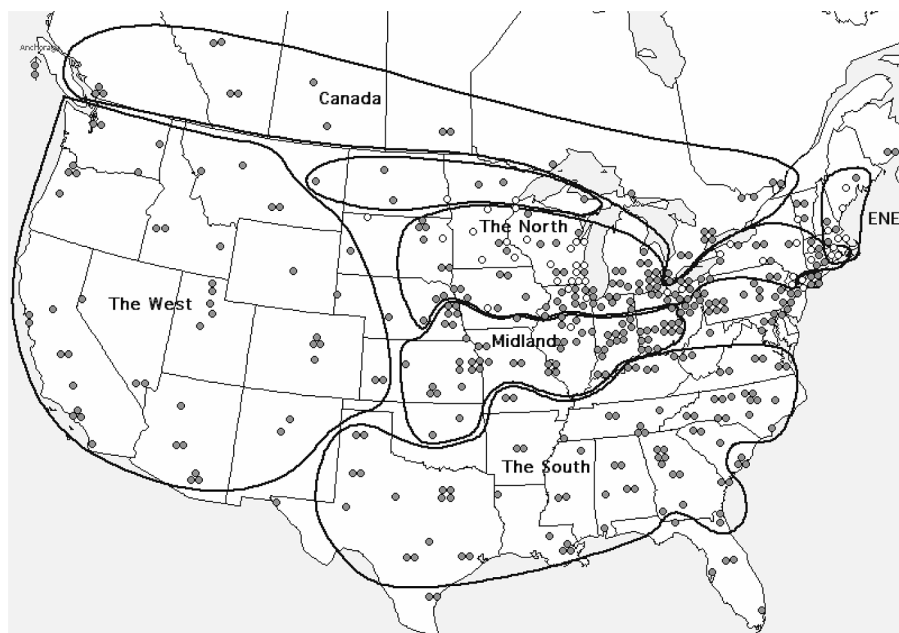


Figure 10. Fronting of /uw/ after coronal consonants. Grey symbols = Second formant > 1550 Hz.

Once we have dispensed with these two areas, we are faced with the fact that /uw/ is fronted without exception in all other regions: in the Midland, the Mid-Atlantic States, in the South, and most importantly in three areas where the low back merger is complete: Canada, The West, and Western Pennsylvania. It is not possible to account for this massive, continental-wide fronting as a response to overcrowding among the back vowels.

Although the structural approach to the causes of /uw/ fronting in North America seems to fail in this case, we can open an inquiry into the causes of this phenomenon from another structural direction. Because /uw/ fronting is so widespread in North America, it is unlikely that we will find a specific population movement like the migration of Slavic coal miners into Eastern Pennsylvania identified by Herold (1990). The antecedent event must be one of great generality. One clue to the problem may be found in the extraordinary difference between the fronting of /uw/ after coronal consonants, examined in Figure 10, and the same word class after non-coronal consonants in *roof, boots, coop, food, move*, etc. While 390 ANAE subjects shifted /uw/ after coronal consonants front of center, only 130 did so for the non-coronal class. Table 4 (columns 2 and 3) demonstrates this extraordinary effect of coronal onset in a regression analysis of all 4,747 tokens of /uw/ measured acoustically.

The age coefficient in Table 4 indicates vigorous change in progress in apparent time. The figure -101 in column 1, row 1 indicates that the expected value of F2 for speakers 25 years older than the mean is 101 Hz less than the general mean of F2 for /uw/, all other things being equal. For the generation 25 years younger than the mean age, the fronting of /uw/ is advanced by 101 Hz. As in most sound changes in progress, women lead: in this case by the effect of half a generation. Among the internal constraints, the effect of a preceding coronal stands out at 480 Hz, more than twice the effect of any other. This means that for the average speaker with a mean F2 for /uw/ after coronal consonants of 1800 Hz, the value of /uw/ after non-coronals is around 1300 Hz, half way between a back and a center vowel.

This preponderant effect of preceding coronals is a striking exception to the general rule that English vowels are influenced by the following environment much more than the preceding one.²¹ It is not difficult to explain the tendency for preceding coronals to promote the fronting of /uw/, which is a widespread effect. It appears strongly in Lennig's (1978) analysis of sound change in progress in Paris. The F2 locus of apical consonants ranges closely around 1800 Hz, so that when a following back /uw/ requires

Table 4. Regression coefficients for F2 of /uw/ and /ow/ for all of North America. Vowels before /l/ excluded.^a Age * 25 years represents the age coefficient times 25.

	/uw/ [N=4747]		/ow/ N=6736]	
	<i>Coefficient</i>	<i>Probability</i>	<i>Coefficient</i>	<i>Probability</i>
Constant	1547		1386	
SOCIAL				
Age * 25	-101	<.0001	-24	<.0001
Female	42	<.0001	46	<.0002
PHONETIC				
Onset				
Coronal	480	<.0001	94	<.0001
Velar	181	<.0001	43	<.0001
Liquid	151	<.0001	—	n.s.
Obstruent+Liquid	164	<.0001	—	n.s.
Labial	104	<.0001	-70	<.0001
Nasal	-54	.0020		
Coda				
None	—	n.s.	31	<.0003
Coronal	70	<.0001	—	n.s.
Nasal	-193	<.0001	-101	<.0001
Fricative	-137	<.0001	-21	.0023
Stop	-89	<.0001	-39	<.0002
Voiced	40	.0095	—	n.s.
Following syllables	—	n.s.	-75	<.0001

^a Vowels before /l/ are excluded, since outside of the South, they are in extreme back position, and even in the South, fronting is quite limited. Because there are many powerful effects, only those with a probability < .01 are shown.

a rapid transition of 1000 Hz from that locus to F2 of the vowel nucleus. Articulatory ease will favor the raising of this second formant. If sound change begins to front /uw/, allophones after coronals will be in advance of others. Yet the size of this effect – 480 Hz – is more than one would expect from a phonetically motivated influence.

One way of evaluating the coronal effect on /uw/ is to compare it to the coronal effect on the fronting of the mid-back vowel /ow/. This parallel fronting is not as widespread as the fronting of /uw/, but is vigorously in progress throughout the Midland, the South and the Mid-Atlantic States (ANAE Ch. 12). The right hand side of Table 4 presents the age coefficients for /ow/. To ensure comparability for phonetic effects, all regions of North America are included, even though there is no active fronting for about half the population. The coefficients for /ow/ are therefore generally lower, since for the regions where there is very little fronting, the effects are much smaller.

In general, the effects on /uw/ and /ow/, both external and internal, are in the same direction. The point of interest is the relation of coefficient for preceding coronals to other effects on /ow/. While the /uw/ coefficient is 2½ times greater than any other, the /ow/ coefficient comparable to other phonetic effects, and less than the influence of following nasals. If the effect of a preceding coronal on /uw/ was the result of the same mechanism as the /ow/ effect, we would expect it to be only 20% greater, since the distance between second formants and the apical locus for extreme back /ow/ is only 20% greater – 1000 Hz as opposed to 800 Hz. It follows that mechanical effects are not likely to account for the 480 Hz coronal coefficients for /uw/. It seems likely that this is a phonological effect, not a phonetic one.

The search for phonological effects leads us to the /yuw/ class of high rising diphthongs, which is historically quite distinct from the falling /uw/. The /yuw/ class was derived from a variety of different sources (Jespersen 1949: 3.8).

- OE **iw** as in *Tiwesdæg* ‘Tuesday’
- OE **e:ow** as in *e:ow*, ‘you’
- French **iu**, as in *riule* ‘rule’
- French unstressed **e+u**, as in *seur* ‘sure’
- French **u**, as in *rude*,
- French. **ui**, as in *fruit*
- French **iv**, as in OF *sivre* -> *M.E. sewe*, ‘sue’

In modern English, these seven were joined by an eighth, which was distinct in Middle English

- OE **e:a** as in *de:aw*, ‘dew’

Although some scholars believe that this vowel was once equivalent to French front rounded [y], Jespersen argues that it has consistently been a rising diphthong /ju/, which in terms of ANAE notation is /yuw/. The /y/ glide is generally maintained after labials and velars, except in Norfolk and a few other sites in England (Trudgill 1974, 1986). In North America, the glide has long been variable after apicals. In many cities, it became a marker of refined speech and varied according to the preceding context: the probability of a /j/ glide is greatest after /t/ in *tune*, etc. and least after /l/ and /r/ in *lewd* and *rude* (where it is also frequently deleted in British English).²²

The development of the /yuw/ class is closely aligned to the problem under study. In current North American English, the historical /y/ glide has all but disappeared after coronal consonants in *tune*, *dew*, *suit*, *stupid*, etc. In the middle of the 20th century, Kurath and McDavid (1961) found widespread use of the glide after coronals in the South, while the characteristic Northern form was [iu], an unrounded front vowel moving back towards a high back target (see also Kenyon and Knott (1953) who represent this vowel generally as [iu]). This vocalic realization set up the contrast indicated in Table 2 as /iw/ vs. /uw/, exemplified by such minimal pairs as *dew* and *do*, *lute* and *loot*, *tutor* and *tooter*. ANAE (Ch. 8) investigated the contrast with the minimal pair *dew* ~ *do*, and mapped both word classes in spontaneous speech as well. Figure 11 shows that the distinction has almost disappeared in North America. It is mainly confined to two limited areas in the South: one in central North Carolina, the other in the smaller cities of the Gulf States. Where the distinction is found, it is almost always in the first mora as a vocalic nucleus: [iu] vs. [U[˘]u], that is, /iw/ vs. /uw/. Only an occasional trace of a consonantal onset representing /yuw/ was found.

This merger of course took place only after coronals, since the contrast existed only after coronals. In other environments, the distinction is not a vocalic one: that is, the difference between *beauty* and *booty*, /byuwtiy/ and /buwtiy/ does not depend upon vowel quality since the front position of the vowel in the first word is the result of its proximity to /y/. The merger after coronals was accomplished by the fronting of /uw/ in those environments. It is only when the merger is complete that the binding force of the phoneme /uw/ (Chapter 7) brings the noncoronal allophones to the front.

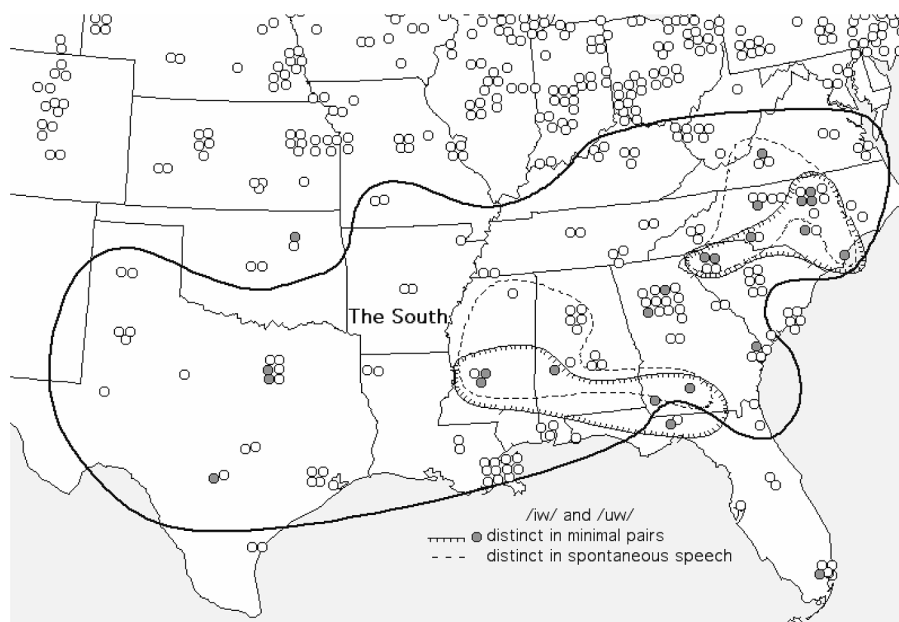


Figure 11. Retention of the /iw ~ /uw/ contrast in North America. Grey symbols and solid isogloss: speakers with /iw/ and /uw/ distinct in production and perception of minimal pair tests. Dashed isoglosses enclose communities where acoustic measurements show a significant difference between /iw/ and /uw/ in spontaneous speech. Solid isogloss defines the South as the area where /ay/ is monophthongal before obstruents.

Figure 12 shows the most conservative dialect in regard to the fronting of /uw/ and /ow/: Providence, Rhode Island. (In this and the diagrams to follow, /Tuw/ indicates /uw/ after coronals, and /Kuw/ after noncoronals.) Here the means for all vowels are back of center, including /iw/ in *stupid* and *Tuesday*. The vowels after non-coronals are further back, not far from the bench mark of vowels before /l/ (not included in the calculation of /Kuw/ means).

Figure 13 shows more advanced fronting in three different patterns. Typical for the North, Canada and West is Figure 13a, the /uw/ and /iw/ vowels of a speaker from Alberta. The mean for /Tuw/ is more than 2000 Hz, well front of the center mark of 1550 Hz, and there is no differentiation of /Tuw/ and /iw/. But the mean of Kuw in *roof*, *boots*, etc. is well back of center, lower than 1400 Hz. This differentiation by 500 Hz is the phonetic

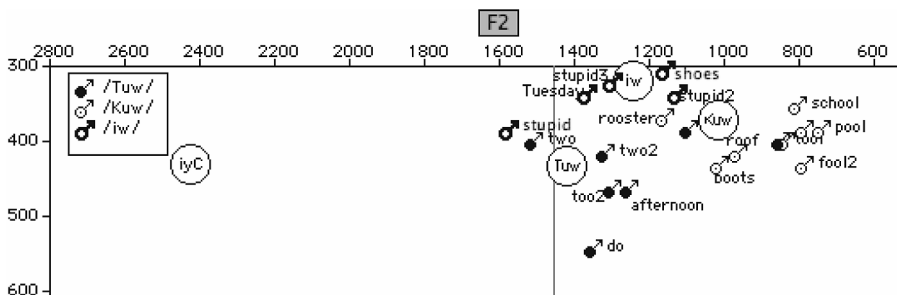


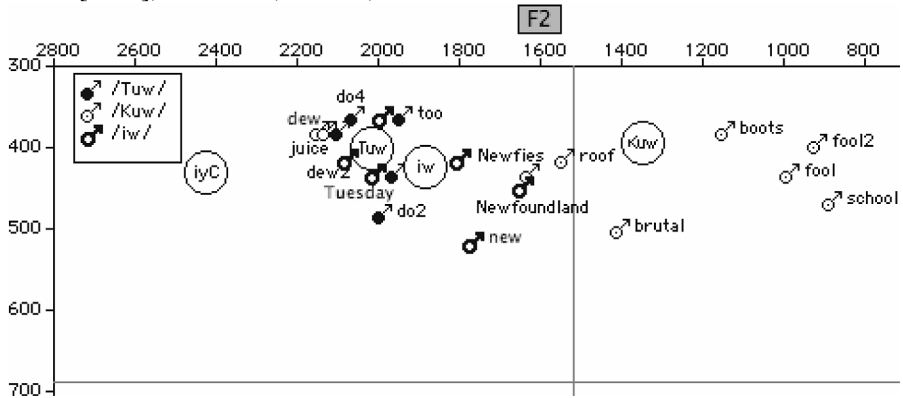
Figure 12. High back upgliding vowels of a conservative speaker from Providence, Rhode Island: Alex S., 42 [1996], TS 47

realization of the regression coefficient of 480 Hz in Table 4. Figure 13b, a speaker from Lexington, Kentucky, is a fully fronted system, where /iw/, /Tuw/ and /Kuw/ are indistinguishable, in high front rounded position, some 900 Hz fronter than /uw/ before /l/. Figure 13c shows the high vowels of a speaker from Charlotte, NC, who maintains the distinction between /iw/ and /uw/. The /iw/ class in *new*, *dew*, *Tuesday*, *Duke*, *shoes* is tightly clustered around a mean at 400, 2094 Hz, while /Tuw/ shows an equally tight cluster at 493, 1789 Hz. Both F1 and F2 differences are significant at the .001 level. The fact that /Tuw/ is only slightly front of center indicates that the distinction between /iw/ and /Tuw/ is maintained only by inhibiting the fronting of /Tuw/. In other words, the merger of /iw/ and /Tuw/ is necessarily correlated with the full fronting of /Tuw/.

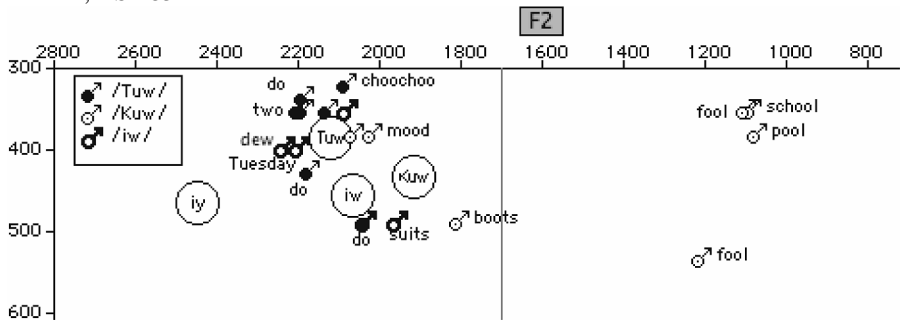
Table 5 allows us to compare the means, age and coronal onset coefficients of /uw/ for eight major ANAE dialects. The regional mean values show that the South and the Midland are the most advanced and the North the least advanced. The array of negative age coefficients indicate that all dialects except the Mid-Atlantic are engaged in change in progress in apparent time, but the size of the age gradient varies widely. Though the South is advanced in fronting, the age coefficient is quite low, and most notably, the coronal onset coefficient is only a small fraction of that found for other dialects. It is less than a third of the coefficient for the equally advanced Midland dialect, reflecting the Southern tendency to retain the /iw/ ~ /uw/ distinction.

The fully fronted /Kuw/ in Figure 13b reflects the general merger of /iw/ with /uw/ as a whole, even though /iw/ has no allophones in common with /Kuw/. The phonological effects of this merger are comparable to the phonological effect of the merger of /o/ and /oh/, and (in the discussion to follow), the merger of /o/ and /ah/.

- a) Differentiation of /uw/ after coronals (Tuw) and noncoronals (Kuw): Brent M., 25 [1997], Edmonton, Alberta, TS 654



- b) Consolidation of /iw, and /uw/ in front position: Fay M., 34 [1995]. Lexington, KY, TS 283



- c) Maintenance of /iw/ ~ /uw/ distinction: Charlotte, NC. Matthew D., 45 [1996], Charlotte NC TS 483

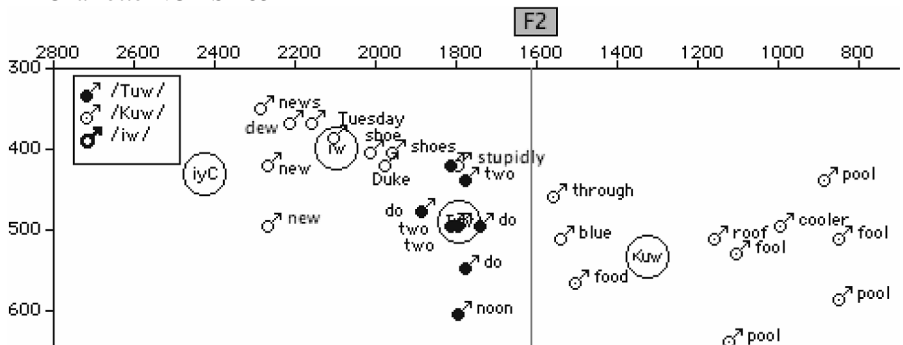


Figure 13. Three fronting patterns of the high back upgliding vowels