

THE PERMEABILITY OF DIALECT BOUNDARIES:
A CASE STUDY OF THE REGION SURROUNDING ERIE, PENNSYLVANIA

Keelan Evanini

A DISSERTATION

in

Linguistics

Presented to the Faculties of the University of Pennsylvania
in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

2009

William Labov, Dissertation Supervisor

Eugene Buckley, Graduate Group Chair

Jiahong Yuan, Committee Member

Mark Liberman, Committee Member

Acknowledgements

I would like to thank my advisor, Bill Labov, for being an excellent teacher, and always being willing to provide advice and encouragement. The two other members of my committee, Mark Liberman and Jiahong Yuan, also deserve warm thanks for always being available and providing useful feedback. Finally, I would like to thank all of the remaining professors in the department for what they have taught me throughout my years at Penn. The spirit of generosity and collaboration exhibited by the professors in the linguistics department is second to none.

I gratefully acknowledge the financial and administrative support provided by the University of Pennsylvania, the School of Arts and Sciences, the Graduate and Professional Student Assembly, the Graduate Student Associations Council, and the Department of Linguistics. In the linguistics department, the administrative support provided by Amy Forsyth and Sue Sheehan was invaluable.

The other graduate students in the department have been a constant source of support and inspiration. I would especially like to thank the other students in my dissertation year for their continuous companionship: Jean Francois Mondon, Laia Mayol, Joshua Tauberer, and Jonathan Gress-Wright (Lucas Champollion also belongs to this group, although his official year of entry into the program is one year later than ours). Many other students also provided valuable discussion and helpful examples of good scholarship throughout the years, including (but not limited to): Damien Hall, Lukasz Abramowicz, Jonathan Wright,

Maya Ravindranath, Suzanne Evans Wagner, Daniel Ezra Johnson, Catherine Lai, James Mesbur, Michael Friesner, and Aaron Dinkin. Special thanks go to Tatjana Scheffler and Marjorie Pak for providing support as the other new parents in the program.

As is the case for any study involving field work, my research would not have been possible without the participation of my informants. I would like to thank all of them for graciously volunteering their time by participating in the study and putting me in contact with other potential informants.

Finally, the completion of this dissertation would never have been possible without the loving care and support provided by my entire family. I would especially like to thank Jamie and Gavin for keeping me focused on what is most important in life.

ABSTRACT

THE PERMEABILITY OF DIALECT BOUNDARIES: A CASE STUDY OF THE REGION SURROUNDING ERIE, PENNSYLVANIA

Keelan Evanini

Supervisor: William Labov

This dissertation presents a dialectological study of the city of Erie, Pennsylvania, and the neighboring towns in the boundary area between the North and Midland dialect regions. Erie occupies a unique place in the dialect geography of North America, in that it appears to have switched status from the North to the Midland. Since the dialect boundary between the North and the Midland has stable throughout the rest of North America, this switch presents an intriguing test case for theories of dialect change and phonological structure.

The field work conducted for this dissertation consists of interviews, word lists, minimal pair tests, and grammatical acceptability judgments. In addition, archival data was used to push the time depth of the analysis further back. In total, data from 106 speakers was analyzed to determine the course of linguistic change in the city of Erie and the current location of the dialect boundaries in the neighboring regions.

In order to process the acoustic data from this large corpus, the methodology of transcription and subsequent forced alignment was applied. This enabled the automatic extraction of 113,245 vowel formant measurements, an amount which would have been difficult to obtain using the standard sociophonetic procedure of manual formant extraction. In order to reduce error in the formant measurements, automatic techniques for measurement point selection and formant prediction were developed.

The acoustic analysis focuses on aspects of the vowel system that differentiate the North and the Midland. The results show that the merger of /o/ and /oh/ began in the city of Erie before 1900, and that it has subsequently spread to the town of Ripley, NY.

Additionally, Erie speakers consistently have a nasal or continuous short-a system. On the other hand, Erie is still located on the Northern side of the boundary with respect to the fronting of the back upgliding vowels /uw/, /ow/, and /aw/. Finally, an analysis of the lexical and morphosyntactic variables shows a widespread acceptability of the Midland features in Erie.

In the final section of the dissertation, the early settlement history of the region is examined, and Erie's acceptance of several Midland features is explained by the early presence of a large contingent of non-Northern, especially Scots-Irish, settlers.

Contents

Acknowledgements	ii
Abstract	iv
Contents	vi
List of Tables	xi
List of Figures	xv
1 Introduction	1
1.1 Empirical Aims	3
1.2 Methodological Aims	5
1.3 Theoretical Aims	7
1.3.1 What Causes the Diffusion of Linguistic Change across Dialect Boundaries?	7
1.3.2 Are All Dialect Boundaries Alike?	8
1.3.3 What is the Relationship between Different Types of Isoglosses? . .	10
1.4 Outline	11
2 Erie's original status as a Northern city	12
2.1 Introduction	12

2.2	Lexical	12
2.3	Phonological	17
3	Data Collection	21
3.1	Introduction	21
3.2	Selection of Individuals	22
3.3	Selection of Speakers: Time Depth	26
3.3.1	Sun Valley residents	27
3.3.2	Archival Material	27
3.4	Selection of Speakers: Geographical Depth	31
3.5	Characteristics of the Corpus	35
3.6	Interview Procedure	37
3.6.1	Materials	37
3.6.2	Equipment	41
3.7	Transcription	41
3.8	Vowel Measurements	44
4	Automatic Vowel Analysis	50
4.1	Introduction	50
4.2	Forced Alignment	51
4.2.1	Forced Alignment Accuracy	53
4.3	Automatic Measurement Point Selection	57
4.3.1	How many measurements to take?	58
4.3.2	Methods for determining a vowel's measurement point	59
4.3.3	A comparison of methods for measurement point selection	65
4.3.4	Where are manual measurements taken?	66
4.4	Formant Prediction	71

4.4.1	Manual Formant Analysis	71
4.4.2	Formant Prediction	80
4.4.3	Evaluation of Proposed Method	84
4.5	Combining proposed methods for measurement point selection and for- mant prediction	90
4.5.1	Comparison to manual formant tracking	92
5	Natural Break Maps	95
6	The merger of /o/ and /oh/	132
6.1	Introduction	132
6.2	Overview of /o/ and /oh/	133
6.3	/o/ and /oh/ in the Midland and the North	134
6.4	Determining whether a speaker has the merger of /o/ and /oh/	138
6.5	Previous sources of information about the merger	142
6.6	The city of Erie: an apparent time study	146
6.7	Archival evidence	149
6.7.1	SWV corpus	149
6.7.2	H. O. Hirt	152
6.7.3	DARE	153
6.8	The Current Geographic Extent of the Merger around Erie	168
6.9	A case study of the merger in progress: the town of Ripley	179
6.10	Explaining the chronology of the merger	184
7	Other Phonological Features	187
7.1	Introduction	187
7.2	Back Upgliding Vowels	188

7.2.1	/uw/	188
7.2.2	/ow/	195
7.2.3	/aw/	202
7.3	NCS vowels	206
7.3.1	/æ/	207
7.3.2	/o/	212
7.4	Other changes in progress	220
8	Lexical and Morphosyntactic Items	223
8.1	Introduction	223
8.2	<i>Elementary</i>	224
8.3	<i>Redd up</i>	228
8.4	Positive <i>anymore</i>	231
8.4.1	Examples from conversational speech	232
8.4.2	Acceptability judgments for positive <i>anymore</i>	233
8.4.3	Discussion	240
8.5	<i>need</i> + Past Participle	240
9	Settlement Patterns	249
9.1	Introduction	249
9.2	Early settlement history of Erie	249
10	Conclusion	257
A	Key to Vowel Symbols	261
B	List of Minimal Pairs Tested	263
C	Word List	264

D Sentences for judgment elicitation task	266
E DARE's version of "Arthur the Rat"	268
Bibliography	271

List of Tables

2.1	Northern isoglosses in <i>WG</i> that contain Erie	13
2.2	Only Northern isogloss in <i>WG</i> that does not contain Erie	13
2.3	Non-Northern isoglosses in <i>WG</i> that do not contain Erie	14
2.4	Only non-Northern isoglosses in <i>WG</i> that contains Erie	14
2.5	Three Western Pennsylvania isoglosses that do not contain Erie	15
2.6	Erie’s position with regard to dialect layers in Carver (1987)	16
2.7	Northern phonological isoglosses that contain Erie in <i>PEAS</i>	18
2.8	Midland / Western PA phonological isoglosses that contain Erie in <i>PEAS</i> . .	19
2.9	/o/ and /oh/ words in <i>PEAS</i> in Erie, the North, and Western PA	19
3.1	Demographic characteristics of the 12 Sun Valley residents	28
3.2	Demographic characteristics of the two speakers from the SWV corpus whose speech was analyzed manually	29
3.3	Demographic characteristics of 14 DARE speakers from archival sources whose acoustic data were analyzed	30
3.4	Demographic characteristics of H.O. Hirt	30
3.5	Demographic characteristics of the 7 ANAE speakers whose acoustic data were re-analyzed	31
3.6	Demographic characteristics of 8 speakers from the city of Erie	32
3.7	Demographic characteristics of 23 speakers from New York	33

3.8	Demographic characteristics of 3 speakers from northeastern Ohio	34
3.9	Demographic characteristics of 11 speakers from western PA	34
3.10	Demographic characteristics of 10 speakers from Erie Co.	35
3.11	Demographic characteristics of 18 unrecorded speakers	36
4.1	Comparison between FA and manual vowel boundaries	56
4.2	Summary of automatic vowel analysis methods under comparison	64
4.3	Mean differences between manual and automatic formant measurements for five different measurement points	65
4.4	Average measurement points for all vowels in two corpora	69
4.5	Average measurement points for each vowel in two corpora	70
4.6	6 pairs of poles and bandwidths returned by a 12th-order autocorrelation LPC analysis in ESPS for a token of the word <i>sack</i>	82
4.7	15 potential F1 and F2 pairs from the LPC data in Table 4.6 that will be considered by the Mahalanobis distance metric in Equation 4.2	82
4.8	$\mu_{/æ/}$, the mean formant and bandwidth values for /æ/ used by the Maha- lanobis distance metric in Equation 4.2	83
4.9	$\Sigma_{/æ/}$, the covariance matrix for the formant and bandwidth values for /æ/ used by the Mahalanobis distance metric in Equation 4.2	83
4.10	Mahalanobis distances for the 15 potential F1 and F2 pairs from the LPC data in Table 4.6	84
4.11	Differences between two formant prediction methods and manual measure- ments	85
4.12	Mean differences between manual and automatic formant measurements taken at one third of the vowel's duration using two different formant pre- diction techniques	92

6.1	Demographic information for the 13 LAMSAS informants shown in Figure 6.3	143
6.2	/o/ and /oh/ or 9 Sun Valley residents from Erie	148
6.3	Words with the vowels /o/ and /oh/ contained in DARE’s “Arthur the Rat” reading passage	154
6.4	/o/ and /oh/ from two DARE speakers from Meadville, PA	156
6.5	/o/ and /oh/ from a DARE speaker from Union City, PA, born 1900	158
6.6	/o/ and /oh/ from two DARE speakers from North East, PA	158
6.7	/o/ and /oh/ from two DARE speakers from Warren, PA	161
6.8	/o/ and /oh/ from a DARE speaker from Jamestown, NY, born 1904	161
6.9	/o/ and /oh/ from three DARE speakers from Fredonia, NY	162
6.10	/o/ and /oh/ from three DARE speakers from Ripley, NY	163
6.11	Demographic information for two adult speakers in Ripley who have the merger of /o/ and /oh/	183
6.12	Demographic information for six unmerged adult speakers in Ripley	183
6.13	Demographic information for three transitional adult speakers in Ripley	183
7.1	Linear regression coefficients for F2 of /uw/ for all environmental features significant at $\alpha = 0.05$	190
7.2	Linear regression coefficients for F2 of /ow/ for all environmental features significant at $\alpha = 0.05$	195
8.2	Coding scheme used for lexical stress in <i>elementary</i>	225
8.3	Demographic information for the six speakers who produced positive <i>anymore</i>	233
8.4	Mean response values (on a scale of 1 – 3) for acceptability judgments on three positive <i>anymore</i> sentences and one control sentence	235

9.1 Population growth in the city of Erie and Erie County, 1800–1890 250

List of Figures

1.1	Erie and the surrounding region	9
3.1	Histogram of birth year for all 106 speakers in the corpus	38
3.2	Locations of all 88 speakers whose acoustic data will be analyzed	39
3.3	Automatic formant measurements for the vowels /o/ and /oh/ for Dan R. from Erie	47
4.1	Difference between manual and FA vowel onset boundary labels	54
4.2	Difference between manual and FA vowel offset boundary labels	55
4.3	The midpoint of the vowel /aw/ in an ANAE token of <i>house</i>	61
4.4	The measurement point selected manually by the ANAE annotators for a token of <i>house</i>	61
4.5	Histogram of differences between automatic and manual F1 measurements using the Third method	67
4.6	Histogram of differences between automatic and manual F2 measurements using the Third method	68
4.7	Location of measurement points for all ANAE vowels	72
4.8	Location of measurement points for vowels in Hillenbrand et al. (1995), Judge #1	73

4.9	Location of measurement points for vowels in Hillenbrand et al. (1995), Judge #2	74
4.10	Location of measurement points by vowel class in ANAE	75
4.11	Location of measurement points by vowel class in Hillenbrand et al. (1995), Judge #1	76
4.12	Location of measurement points by vowel class in Hillenbrand et al. (1995), Judge #2	77
4.13	Praat LPC analysis of <i>sack</i> with 5 predicted formants, including a spurious second formant	79
4.14	Praat LPC analysis of <i>sack</i> with 4 predicted formants	79
4.15	ESPS F1 and F2 measurements for /iy/, /uw/ and /o/	87
4.16	F1 and F2 measurements for /iy/, /uw/ and /o/ predicted by the Mahalanobis distance metric	88
4.17	Manual F1 and F2 measurements for /iy/, /uw/ and /o/	89
4.18	Comparison of NCS vowel means produced by manual and automatic mea- surements for 52 Inland North speakers from ANAE	91
5.1	Natural break map for F1 of /i/	98
5.2	Natural break map for F2 of /i/	99
5.3	Natural break map for F1 of /e/	100
5.4	Natural break map for F2 of /e/	101
5.5	Natural break map for F1 of /æ/	102
5.6	Natural break map for F2 of /æ/	103
5.7	Natural break map for F1 of /æN/	104
5.8	Natural break map for F1 of /æN/	105
5.9	Natural break map for F1 of /o/	106

5.10	Natural break map for F2 of /o/	107
5.11	Natural break map for F1 of /ʌ/	108
5.12	Natural break map for F2 of /ʌ/	109
5.13	Natural break map for F1 of /u/	110
5.14	Natural break map for F2 of /u/	111
5.15	Natural break map for F1 of /iy/	112
5.16	Natural break map for F2 of /iy/	113
5.17	Natural break map for F1 of /ey/	114
5.18	Natural break map for F2 of /ey/	115
5.19	Natural break map for F1 of /ayV/	116
5.20	Natural break map for F2 of /ayV/	117
5.21	Natural break map for F1 of /ay0/	118
5.22	Natural break map for F2 of /ay0/	119
5.23	Natural break map for F1 of /oy/	120
5.24	Natural break map for F2 of /oy/	121
5.25	Natural break map for F1 of /Tuw/	122
5.26	Natural break map for F2 of /Tuw/	123
5.27	Natural break map for F1 of /Kuw/	124
5.28	Natural break map for F2 of /Kuw/	125
5.29	Natural break map for F1 of /ow/	126
5.30	Natural break map for F2 of /ow/	127
5.31	Natural break map for F1 of /aw/	128
5.32	Natural break map for F2 of /aw/	129
5.33	Natural break map for F1 of /oh/	130
5.34	Natural break map for F2 of /oh/	131

6.1	/o/ and /oh/ from Walter K., born 1927 in Buffalo	135
6.2	/o/ and /oh/ from Gwen S., born 1929 in Pittsburgh	137
6.3	The status of /o/ and /oh/ for 13 LAMSAS speakers from the region around Erie	145
6.4	/o/ and /oh/ from Dan R., born 1912 in Erie	147
6.5	/o/ and /oh/ from Richard O., born 1906 in North East	150
6.6	/o/ and /oh/ from Benjamin S., born 1907 in North East	151
6.7	/o/ and /oh/ from H. O. Hirt, born 1887 in Erie	152
6.8	Euclidean distances between /o/ and /oh/ for 14 DARE speakers	157
6.9	/o/ and /oh/ from Sarah N., born 1897 in North East	159
6.10	/o/ and /oh/ from Nancy S., born 1908 in North East	160
6.11	/o/ and /oh/ from Wallace L., born 1892 in Fredonia	163
6.12	/o/ and /oh/ from Jill C., born 1889 in Ripley	165
6.13	/o/ and /oh/ from Clarence T., born 1886 in Ripley	166
6.14	/o/ and /oh/ from Jonas H., born 1898 in Ripley	167
6.15	Geographic extent of the merger of <i>cot</i> and <i>caught</i> around Erie, minimal pair production data	169
6.16	Geographic extent of the merger of <i>Don</i> and <i>Dawn</i> around Erie, minimal pair production data	170
6.17	Geographic extent of the merger of <i>Don</i> and <i>Dawn</i> around Erie, minimal pair perception data	172
6.18	Geographic extent of the merger of <i>Don</i> and <i>Dawn</i> around Erie, minimal pair perception data	173
6.19	Geographic extent of the merger of <i>collar</i> and <i>caller</i> around Erie, minimal pair production data	175

6.20	Geographic extent of the merger of <i>collar</i> and <i>caller</i> around Erie, minimal pair perception data	176
6.21	Geographic extent of the merger of <i>stock</i> and <i>stalk</i> around Erie, minimal pair production data	177
6.22	Geographic extent of the merger of <i>stock</i> and <i>stalk</i> around Erie, minimal pair perception data	178
6.23	Euclidean distance between the mean values of /o/ and /oh/	180
6.24	/o/ and /oh/ from Ryan N., born 1994 in Ripley	182
7.1	/Kuw/ and /Tuw/ for Rachel A., born 1951 in Ripley	192
7.2	F2 of /Tuw/ (/uw/ after coronals)	194
7.3	F2 of /Kuw/ (/uw/ after non-coronals)	196
7.4	/ow/ for Cecilia S., born 1933 in Pittsburgh	199
7.5	/ow/ for Bill R., born 1927 in Buffalo	200
7.6	F2 of /ow/	201
7.7	F2 of /aw/	203
7.8	Relationship between /aw/ and /ayV/	205
7.9	Raising of /æ/	209
7.10	F1 of /æ/ by age for 56 speakers from Pennsylvania	210
7.11	F1 of /æ/ by age for 30 speakers from New York	211
7.12	The fronting of /o/	214
7.13	The relationship between a speaker's mean F2 value of /o/ and the merger of /o/ and /oh/ in <i>Don</i> vs. <i>dawn</i>	216
7.14	The relative position of /e/ and /o/ in the F2 domain	218
7.15	/æ/, /o/, and /oh/ from Amy C., born 1937 in Westfield	219
7.16	Minimal pair results for <i>poor</i> vs. <i>pour</i> : production data	222

8.2	Lexical stress in <i>elementary</i>	227
8.3	Acceptability responses for the sentence <i>I really should redd up the living room.</i>	230
8.4	Acceptability responses for the sentence <i>I was a pitcher when I was young, but now I don't play baseball anymore.</i>	236
8.5	Acceptability responses for the sentence <i>Ticket prices are so high anymore, I never go to the movie theater.</i>	237
8.6	Acceptability responses for the sentence <i>Anymore, there's too much crime in this neighborhood.</i>	238
8.7	Acceptability reponses for the sentence <i>John eats fast food so much anymore, it's no wonder that he's becoming overweight.</i>	239
8.8	Responded for the forced-choice completion task for the sentence <i>I drove through a big, muddy puddle yesterday. Now my car needs -----</i>	243
8.9	Responded for the forced-choice completion task for the sentence <i>I haven't cleaned my kitchen in weeks. The floor really needs -----</i>	244
8.10	Acceptability responses for the sentence <i>I got into an accident last week, and now my front bumper needs repaired.</i>	245
8.11	Acceptability responses for the sentences <i>My cat looks really hungry. I think he wants fed.</i>	247
8.12	Acceptability responses for the sentence <i>Every newborn baby likes cuddled.</i>	248
9.1	Place of birth of Revolutionary Patriots from Erie County	252
9.2	Place of birth of prominent 19th century Erie County residents	254