40 Years of Sound Change in Progress

William Labov
University of Pennsylvania

NWAV40  Georgetown  Oct 29  2011
Two forty-year spans

Nwave 1 1972
Linguistic Change & Variation

Nwav 40 2011

Ling560 1972
The Study of the Speech Community

Ling560 2010
The study of Language Change and Variation [LCV] in Philadelphia, 1973-1979

<table>
<thead>
<tr>
<th>Author</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Bower</td>
<td></td>
</tr>
<tr>
<td>Gregory Guy</td>
<td>Guy 1980, Guy &amp; Boyd 1990</td>
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<tr>
<td>Don Hindle</td>
<td>Hindle 1980</td>
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<tr>
<td>Matt Lennig</td>
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<td>Arvilla Payne</td>
<td>Payne 1976, 1980</td>
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<td>Deborah Schiffrin</td>
<td>Schiffrin 1981</td>
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</tbody>
</table>
1970s Neighborhood Study supplemented by the Philadelphia Telephone Survey [N=60]
Figure 3.6. Movement of Philadelphia vowels in apparent time. Circles: mean values for 116 speakers in the Neighborhood Study. Vectors connect values for groups 25 yrs older & younger than mean. \( _\text{F} \) = free vowel; \( _\text{C} \) = checked vowel. \( _0 \) = before voiceless finals.

<table>
<thead>
<tr>
<th>P &lt; 0.10</th>
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<th>P &lt; 0.01</th>
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LING 560
The Study of the Speech Community
LINGUISTICS 560

PLAN OF THE COURSE

September

9/14 Formation of groups

9/14-21 Selection of the neighborhood

9/21-28 Entering the neighborhood: first contacts

9/28-10/12 The first interview

10/12-19 Stylistic analysis

10/19-11/9 Linguistic variables

Observation: the use of public space

Techniques of tape recording

The study of narrative

Conversational resources

Fall 2010
11/14 - Formal inquiry in the interview

Minimal pair and commutation tests
Family background tests
Subjective reaction tests
Self-report tests
Linguistic insecurity tests

INSTITUTIONS
The school
The church
The store
Play ground
Block parties
Senior citizens

THE NEIGHBORHOOD

BROADENING THE SAMPLE
Site study
Mass media
Rapid & anonymous studies

PHILADELPHIA

FINAL REPORT

Temporal organization
Evaluation
Organization
Q-GEN-II modules
Topic shifting

Causal sequencing
Identification of cultural norms
Turn-taking
The Philadelphia Neighborhood Corpus [PNC] of LING560 Studies

- Sociolinguistic interviews by students in LING560, “The Study of the Speech Community” (W. Labov, G. Sankoff)
- Yearly, 1972-1992; Bi-yearly, 1994-2010:
  - 59 neighborhood studies
  - 1,087 recordings
- Time span:
  - Dates of interviews: 38 years
  - Dates of birth: 103 years
- Material transcribed to date:
  - 49 neighborhoods
  - 318 speakers
  - over 150 hours of speech (average 29 minutes/speaker)
  - Approx. 1.6 million words
- Support: National Science Foundation Grant 92143, Automatic alignment and analysis of linguistic change, 2009-11
Locations of LING560 Philadelphia Neighborhood Studies, 1972-2010
The Wicket St. neighborhood network in Kensington
Members of LING560 groups from 1972 to 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Name 1</th>
<th>Name 2</th>
<th>Name 3</th>
<th>Name 4</th>
<th>Name 5</th>
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<td>1972</td>
<td>John Rickford</td>
<td>John Baugh</td>
<td>Martha Pennington</td>
<td></td>
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<tr>
<td>1973</td>
<td>Gregory Guy</td>
<td>Sherry Ash</td>
<td>Ivan Sag</td>
<td>Don Hindle</td>
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<tr>
<td>1974</td>
<td>Barbara Freed</td>
<td>Sally Boyd</td>
<td></td>
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<td>1975</td>
<td>Matt Lennig</td>
<td>Marco Oliveira</td>
<td></td>
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<tr>
<td>1976</td>
<td>Shana Poplack</td>
<td>Ana Celia Zentella</td>
<td>Debby Schiffrin</td>
<td>Elizabeth Dayton</td>
<td>Catharine Barale</td>
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<tr>
<td>1977</td>
<td>Claude Paradis</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1978</td>
<td>Hassan Abdel-Jawad</td>
<td>Miwa Nishimura</td>
<td></td>
<td></td>
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<tr>
<td>1979</td>
<td>Gregory Ward</td>
<td>John Myhill</td>
<td>Paul Frank</td>
<td></td>
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<tr>
<td>1980</td>
<td>Otto Santa Ana</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1982</td>
<td>Robin Sabino</td>
<td>Niloofar Haeri</td>
<td>Rakhmiel Peltz</td>
<td>Susan Pintzuk</td>
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<td>1984</td>
<td>Eve Danziger</td>
<td>Ruth Herold</td>
<td></td>
<td></td>
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<tr>
<td>1985</td>
<td>Caroline Heyock</td>
<td>Daniel Lefkowitz</td>
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<tr>
<td>1986</td>
<td>Richard Cameron</td>
<td>Kirk Belnap</td>
<td>Elise Morse Gagne</td>
<td>Tom Veatch</td>
<td>Josep Fontana</td>
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<td>1986</td>
<td>Peter Patrick</td>
<td>Shobha Satyanath</td>
<td>Raffaella Zanuttini</td>
<td>Barbie Zelizer</td>
<td></td>
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<td>1988</td>
<td>Scott Kiesling</td>
<td>Julie Auger</td>
<td>Ken Matsuda</td>
<td>Umit Turan</td>
<td>Mark Karan</td>
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<tr>
<td>1989</td>
<td>Carmen Fought</td>
<td>Raj Mesthrie</td>
<td>Tom Morton</td>
<td>Seo Yong Chae</td>
<td>Sheng-li Fung</td>
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<tr>
<td>1990</td>
<td>Naomi Fought</td>
<td>Mary O'Malley</td>
<td>Corey Miller</td>
<td>Deb Augsburger</td>
<td>Christine Zeller</td>
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<td>1991</td>
<td>Charles Boberg</td>
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<td>Bill Reynolds</td>
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<td>1992</td>
<td>Miriam Meyerhoff</td>
<td>Stephanie Strassel</td>
<td></td>
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<td>1994</td>
<td>David Bowie</td>
<td>Anita Henderson</td>
<td>Hikyoung Lee</td>
<td></td>
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<tr>
<td>1998</td>
<td>Ron Kim</td>
<td>Tara Sanchez</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2000</td>
<td>Daniel Johnson</td>
<td>Jeff Conn</td>
<td></td>
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<tr>
<td>2002</td>
<td>Suzanne Wagner</td>
<td></td>
<td></td>
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<tr>
<td>2004</td>
<td>Maya Ravindranath</td>
<td>Aaron Dinkin</td>
<td>Keelan Evanini</td>
<td>Michael Friesner</td>
<td>L. Abramowicz</td>
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<td>2006</td>
<td>Josef Fruehwald</td>
<td>Laurel MacKenzie</td>
<td></td>
<td></td>
<td>Damien Hall</td>
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<tr>
<td>2010</td>
<td>Hilary Prichard</td>
<td>Meredith Tamminga</td>
<td></td>
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</tbody>
</table>
In Memoriam

To our knowledge, only one former member of Ling560 has passed away: Miwa Nishimura, who was killed in a car accident in 2004. The *Handbook of East Asian Psycholinguistics Volume II: Japanese*, edited by Mineharu Nakayama, Reiko Mazuka, and Yasuhiro Shira (2006, Cambridge U.P.) was dedicated to her memory:
PNC subjects analyzed as of November 2011 by Age and Year of Interview
Distribution of Dates of Birth in Philadelphia Neighborhood Corpus, 1887 - 1991
The Measurement of Sound Change
Measurements of the vowel system of a Philadelphia ANAE subject, N= 214
The FAVE revolution

Ingrid Rosenfelder
Josef Fruehwald
Keelan Evanini
Jiahong Yuan
The FAVE web site fave.ling.upenn.edu

**Forced Alignment & Vowel Extraction (FAVE)**
An online suite for automatic vowel analysis

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**What is FAVE?**

The FAVE (Forced Alignment & Vowel Extraction) program suite allows you to automatically align and extract large quantities of vowel formant measurements from sociolinguistic interviews or other bodies of orthographically transcribed data.

FAVE is a set of two programs: FAVE-align and FAVE-extract.
FAVE-align

FAVE-align is a forced alignment program adapted for sociolinguistic interviews or other texts with multiple speakers. It accepts as input a sound file with its corresponding orthographic transcript, and returns a Praat TextGrid file with two tiers per speaker, a phone tier and a word tier.

FAVE-extract

FAVE-extract automatically measures the formant values for F1 and F2 for all vowels for a given speaker. Its input is a sound file with its corresponding aligned TextGrid (typically the output of FAVE-align).

How does it work?

The FAVE-align and FAVE-extract interfaces allow you to upload your files to the server, which then processes them in the background, and will send you the resulting files as an email attachment.

Please note that depending on the volume of traffic for the web site, the processing of your uploaded files may take a while. Do not expect immediate results! You can, however, generally expect to receive your results within a day.

Detailed instructions on how to use FAVE-align and FAVE-extract can be found on these pages:

- How to use FAVE-align
- How to use FAVE-extract
Consequences of the FAVE revolution: Tracing lexical diffusion of short-a tensing in the Philadelphia vowel system
Tensing of short-a in Philadelphia before /d/:

<table>
<thead>
<tr>
<th>p</th>
<th>t</th>
<th>tʃ</th>
<th>k</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>d</td>
<td>dʒ</td>
<td>g</td>
</tr>
<tr>
<td>m</td>
<td>n</td>
<td>η</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>θ</td>
<td>s</td>
<td>ʃ</td>
</tr>
<tr>
<td>v</td>
<td>ð</td>
<td>z</td>
<td>ʒ</td>
</tr>
<tr>
<td>l</td>
<td>r</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hand measurements of /æh, æ, Tuw, Kuw, oh/ for Philadelphia ANAE subject TS520 [N=214]
Hand measurements of /æh and æ/ for Philadelphia ANAE subject TS520 [N= 321]
Tense and lax vowels before /d/ of Jean H.

Short-a before /d/ for Jean H., 60, Group 2 of 2006 [N=7,101].
Short-a before /d/ for Jean H., 60, Group 2 of 2006 [N=7,101].
Tensing of short-a in Philadelphia before /L/

- p, t, tf, k
- b, d, dʒ, g
- m, n
- f, θ, s, ʃ
- v, ð, z, ʒ

Examples:
- pal
- Sal
- Italian
- personality
- alligator
- mallet
- alley
- . . .
Short-a before /l/ in the vowel system of Marie C., 62, [1973], Philadelphia

/æh/

/æ/
Shift of /æ/ before /l/ from lax to tense category in the vowel system of Jean H., 60 [2006], Philadelphia
The uniform progress of sound change throughout the speech community
Fronting of /ey/ (F2) in closed syllables in *made, pain, lake,* etc. by age with partial regression lines for 6 socioeconomic groups in Philadelphia [N=112]
Scatterplot of the fronting of (eyC) by age and socioeconomic class, with partial regression lines for social classes, from the LVC Philadelphia Neighborhood Study 1972-1979 [N=112].
Mean values of Philadelphia vowels for 272 PNC speakers
Mean values of /eyC/ in made, pain, gate, etc. of 272 PNC speakers by age (double scale)
Mean values of /eyC/ in *made, pain*, etc. of 272 PNC speakers by date of birth (double scale)
Increasing height of /eyC/ in made, pain, etc. by Date of birth and Sex

Stability of /eyF/ in may, mayor, etc. by Date of birth and Sex
Increasing height of /eyC/ in *made, pain*, etc. by Date of birth and by Sex

Date of birth

Sex

m

f

Education

Ed

Hi

Lo

Date of birth
Multiple regression output for F1 of /eyC/ by date of birth, gender and education for 269 PNC speakers (Data Desk 6.3)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>s.e. of Coeff</th>
<th>t-ratio</th>
<th>prob</th>
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<tbody>
<tr>
<td>Constant</td>
<td>2534.47</td>
<td>164.3</td>
<td>15.4</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Date of birth</td>
<td>-0.98289</td>
<td>0.0847</td>
<td>-11.6</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Female</td>
<td>-1.46349</td>
<td>3.78</td>
<td>-0.387</td>
<td>0.6989</td>
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<td>&gt;12</td>
<td>-5.0555</td>
<td>4.54</td>
<td>-1.11</td>
<td>0.2665</td>
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</table>
Multiple regression output for F1 of /eyC/ by decade of date of birth, gender and education for 269 PNC speakers (Data Desk 6.3)

<table>
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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>s.e. of Coeff</th>
<th>t-ratio</th>
<th>prob</th>
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<tbody>
<tr>
<td>Constant</td>
<td>664.306</td>
<td>6.888</td>
<td>96.4</td>
<td>&lt; 0.0001</td>
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<tr>
<td>1900s</td>
<td>0</td>
<td></td>
<td></td>
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<tr>
<td>1910s</td>
<td>-5.76429</td>
<td>9.366</td>
<td>-0.615</td>
<td>0.5388</td>
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<td>1920s</td>
<td>-23.3117</td>
<td>7.995</td>
<td>-2.92</td>
<td>0.0039</td>
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<td>1930s</td>
<td>-33.8408</td>
<td>8.927</td>
<td>-3.79</td>
<td>0.0002</td>
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<td>1940s</td>
<td>-43.3688</td>
<td>8.169</td>
<td>-5.31</td>
<td>&lt; 0.0001</td>
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<td>1950s</td>
<td>-42.6305</td>
<td>8.255</td>
<td>-5.16</td>
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<tr>
<td>1960s</td>
<td>-60.8805</td>
<td>8.335</td>
<td>-7.3</td>
<td>&lt; 0.0001</td>
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<td>1970s</td>
<td>-64.1237</td>
<td>9.099</td>
<td>-7.05</td>
<td>&lt; 0.0001</td>
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<td>1980s</td>
<td>-89.0454</td>
<td>12.05</td>
<td>-7.39</td>
<td>&lt; 0.0001</td>
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<td>1990s</td>
<td>-108.033</td>
<td>23.45</td>
<td>-4.61</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Female</td>
<td>-2.66102</td>
<td>3.86</td>
<td>-0.689</td>
<td>0.4912</td>
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<tr>
<td>Higher Ed</td>
<td>-4.77258</td>
<td>4.807</td>
<td>-0.993</td>
<td>0.3217</td>
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</tbody>
</table>
Raising of /eyC/ by date of birth for 269 LING560 speakers
Increasing height of /eyC/ in *made, pain*, etc. by Date of birth and by Sex

by Education
Continued raising of /ay0/ in *sight, pipe, bike, etc.* by Date of birth

Stability of /ayV/ in *side, ride, why, etc.* by Date of birth
Continued raising of /ay0/ in *sight*, *bike*, etc. for 269 PNC speakers by Date of Birth by Sex by Education.
Socially salient features of Philadelphia phonology: recent lowering of tense /æh/ and /oh/
Recent lowering of tense /æh/ for PNC speakers born in 1960s and later by Sex

Recent lowering of tense /æh/ for PNC speakers born in 1960s and later by Education
Lowering of tense /oh/ in *caught, law, off*, etc. for PNC speakers born in 1960s and later by Sex

![Graph showing the lowering of tense /oh/ by sex and education over the years.](image)

-Sex: m (male), f (female)

-Education: Hi (high), Lo (low)

Date of birth:

-1900, 1920, 1940, 1960, 1980
Reversal of sound changes
F2 of /o/ in the Inland North core, as in Figure 21 above, split into two apparent time halves between 1960 and 1961, with no correlation between F2 and age in either.

[Fig. 5.26. Aaron Dinkin, *Dialect Boundaries and Phonological Change in Upstate New York*. U. of Pennsylvania dissertation, 2009.]
Fronting of (aw) in *down, South*, etc by age with partial regression lines for sex in LVC Philadelphia Neighborhood Study of 1973-1977 [N=112]
Conn’s 2005 dissertation *Of Moice and Men*: Expected values of F2 for /aw/, LCV (1975) and OMM (2003) combined (Fig. 5.10)

By combining the LCV and the OMM data, it is possible to follow the evolution of this change and its subsequent reversal of direction in the last 30 years. A reversal in the direction of this change does occur in the oldest generations, so its emergence in the youngest generations leads to an interpretation that language change may not be a seamless continuous movement in one direction without backwards steps.

Reversal of /aw/ in south, down, out, etc., for PNC speakers born in 1960s and later

by Sex

by Education
Reversal of fronting of /aw/ for PNC speakers born in 1960s and later by Sex

Reversal of fronting of /aw/ for PNC speakers born in 1960s and later by Education
Reversal of raising & fronting pf /aw/ for PNC speakers born in 60s and later by Sex

Reversal of raising & fronting pf /aw/ for PNC speakers born in 60s and later by Education
Regression analyses of raising of /aw/ on the front diagonal (F2-2*F1) for those born before and after 1960

<table>
<thead>
<tr>
<th>Variable</th>
<th>Born 1960 or before</th>
<th>Born after 1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of birth</td>
<td>3</td>
<td>-10</td>
</tr>
<tr>
<td>Female</td>
<td>190</td>
<td>94</td>
</tr>
<tr>
<td>Irish</td>
<td>81</td>
<td>270</td>
</tr>
</tbody>
</table>

Coefficients and p-values for each variable.
The study of variation . . .

shows us how different people can be, as speakers use the social meaning of variants to align themselves with or against various local groups.

As the volume of our data increases, we sometimes find significant differences among members of the population, testifying to the differentiating force of the variable or the change in progress.

But from the outset, the study of variation shows us how similar members of the speech community are, that the orderly heterogeneity of the community is a social fact in Durkheim’s sense. We saw that first in the uniform patterns of style shifting in the New York City community.
Social and stylistic stratification of (ing) in the random sample of the Lower East Side of New York City adults [N=81]

Source: Labov 1966
Social and stylistic stratification of (ing) in the random sample of the Lower East Side of New York City adults [N=81]

Source: Labov 1966
Social and stylistic stratification of (ing) in the random sample of the Lower East Side of New York City adults [N=81]

Social classes reacting in the same way to stylistic contexts

Source: Labov 1966
How do we go about accounting for uniformity among groups who are not engaged in face-to-face interaction?

- Valerie Fridland confronted the problem when she found that in Memphis, blacks and whites shared many linguistic directions though they had little direct contact.

“these shared practices do not necessarily require individuals’ social cohesion but merely require shared historical experience and a strongly circumscribing environment that places speakers in a similar social position relative to the external social world.”

As our data base grows in size, we are not drowned in more and more variation, but instead, uniform and regular patterns of change emerge that carry millions of speakers in the same direction, moving in lock step with people they never speak to.

With tools or a more limited sort, the Atlas of North American English found an even more widespread geographic uniformity in such regional patterns as the Northern Cities Shift, where vowel systems are rotating in the same direction over 88,000 square miles. But that data base, limited to two speakers in each city, could not yield the insights we gain from the 300 speakers and the half million vowels of the PNC Corpus.
We are far from understanding how this uniformity comes about . . .

More intense field work is needed on the connections, the weak ties, that unite widely separated social networks. But even more attention has to be given to the larger forces that drive linguistic change.

The new sound changes are so far below the level of social awareness that we are motivated to look for purely structural explanations. But the decade of the 1960s is not a unit of formal linguistics. Something happened then that affected the way that Philadelphians in general treat the nucleus of /aw/. What was it?
Looking beyond the white mainstream

We might indeed look to relations among the various communal groups in Philadelphia. Previous experiments have shown that the low front nucleus of /aw/ was an absolute diagnostic of white speech for all members of the community, at least in the 1980s.

The LING560 interviews include many in black, Hispanic and mixed neighborhoods. Our first examination of these materials indicate that minority members follow the Philadelphia sound system but at a distance, without participating in the new and vigorous changes in progress.

Our current proposals call for an expansion and generalization of FAVE to deal with minority groups and Spanish language materials.
We are encouraged . . .

by the output of our new tools, and look forward to the results of others’ use of them. We think that the study of language change and variation has a bright future in the decades to come. We will continue to learn from the study small groups and learn more about how language changes can differentiate more and more finely divided segments of society. Many of the LING560 papers have done just that in a single neighborhood. But the questions concerning the nature of language and the causes of language change will arise only when we consider the larger speech community in all of its enigmatic uniformity.
Acknowledgments

fave.extract: Ingrid Rosenfelder, Joe Fruehwald, Keelan Evanini
fave.align: Ingrid Rosenfelder, Jiahong Yuan
Graphics: Joe Fruehwald
Coordination: Sue Sheehan
Support: NSF 92143; Automatic alignment and analysis of linguistic change. 2009-2011.

URL: fave.ling.upenn.edu
And thanks to

1972  John Rickford  John Baugh  Martha Pennington
1973  Gregory Guy  Sherry Ash  Ivan Sag  Don Hindle
1974  Barbara Freed  Sally Boyd
1975  Matt Lennig  Marco Oliveiro
1976  Shana Poplack  Ana Celia Zentella  Debbie Schiffrin  Elizabeth Dayton  Catharine Barale
1977  Claude Paradis
1978  Hassan Abdel-Jawad  Miwa Nishimura
1979  Gregory Ward  John Myhill  Paul Frank
1980  Otto Santa Ana
1982  Robin Sabino  Niloofar Haeri  Rakhmiel Peltz  Susan Pintzuk
1984  Eve Danziger  Ruth Herold
1985  Caroline Heyock  Daniel Lefkowitz
1986  Richard Cameron  Kirk Belnap  Elise Morse Gagne  Tom Veatch
1986  Peter Patrick  Shobha Satyanaath  Raffaella Zanuttini  Barbie Zelilizer  Josep Fontana
1989  Carmen Fought  Raj Mesthrie  Tom Morton  Seo Yong Chae  Sheng-li Fung
1990  Naomi Nagy  Mary O'Malley  Corey Miller  Deb Augsburger  Christine Zeller  Bill Reynolds
1991  Charles Boberg
1992  Miriam Meyerhoff  Stephanie Strassel
1994  David Bowie  Anita Henderson  Hikyoung Lee
1998  Ron Kim  Tara Sanchez
2000  Daniel Johnson  Jeff Conn
2002  Suzanne Wagner
2004  Maya Ravindranath  Aaron Dinkin  Keelan Evanini  Michael Friesner  L. Abramowicz  Damien Hall
2006  Josef Fruehwald  Laurel MacKenzie
2010  Hilary Prichard  Meredith Tamminga