

# SOUND CHANGE ACROSS SPEECH ISLANDS: THE DIPHTHONG /aɪ/ IN TWO MIDWESTERN PENNSYLVANIA GERMAN COMMUNITIES\*

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## Abstract

This paper analyzes the variable production of the Pennsylvania German diphthong /aɪ/ in two Pennsylvania German speech islands in Iowa and Ohio. The data show that younger speakers regularly monophthongize /aɪ/, yielding [e:] or even (in Ohio only) [e:], and perceptual studies show that the latter form merges with the vowel space of the phoneme /e:/. This sound change is shown to be an example of language drift (i.e., internally motivated), though its spread across distant speech islands is suggestive of significant ongoing patterns of interaction between these speech islands.

## 0 Introduction

This paper presents evidence for a sound change in progress in the vowel system of Midwestern Pennsylvania German (PG): the monophthongization and fronting/raising

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\* Thanks to Brian Joseph, Don Winford, and Rich Janda for their comments and suggestions. Also thanks to Keith Johnson for advice on perception experiments, to Anna Grotans for references on German etymology, Mary Beckman, Matt Makashay, Christian Uffman, and many others in the Linguistics Department at OSU. Finally a big thank you to the Matthew Schrock extended family for hours of conversation and hospitality, and to the dozens of coworkers who patiently taught me and became friends in addition to serving as an invaluable source of data during our days together.

of the diphthong /aɪ/. Variation in the phonetic production of this phoneme is socially significant. The use of the (older) variant [aɪ] in a word such as [daɪf], 'German,' is described as non-native or typical of a second-language learner. In addition, a subset of speakers in one Midwestern community produce variants of /aɪ/ that overlap the vowel space of the PG phoneme /eɪ/, and preliminary perceptual testing indicates that phonemic merger is underway. The fact that this sound change has spread across geographically distant communities poses questions for processes of dialect contact across speech islands.

I begin with a review of the previous research on this phenomenon. In the second section I provide a brief synchronic description of the PG vowel space and delineate the word set containing /aɪ/ in the Kalona and Holmes County dialects. I also present data on the production of /aɪ/ from earlier time periods to establish the diachronic basis for the sound change. I introduce my synchronic data in the third section, including a description of the selection of variants and an investigation of the linguistic and social conditioning of these variants. I then investigate a possible phonemic merger underway and test its salience. The fifth section I devote to discussions of various accounts for the origin and spread of the sound change. Finally, I comment on some implications of these data for the study of the spread of sound change between geographically noncontiguous communities.

## 1 Previous Research

To date, only two researchers have mentioned the vowel system developments in question here. In Schlabach's 1980 thesis on the phonology of Holmes County PG, he comments: "...some speakers (as I have observed) regularly substitute the long vowel /æ:/ for the diphthong /aɪ/ in all words in OPG" (39). He goes on to note the following examples, including some minimal pairs distinguished by nasalized vowels (39, 43):

- (1) /hɑɪ/ ~ /hæ:/ 'today' (39)  
 /daɪ/ ~ /dæ:/ 'your' (sg.) (43)  
 /sɑɪ/ ~ /sæ:/ 'pigs' (67)  
 /sɑɪ/ ~ /sæ:/ 'his' (67)  
 /nɑɪ/ ~ /næ:/ 'new' (67)  
 /naɪ/ ~ /næ:/ 'in' (67)  
 /naɪ/ ~ /næ:/ 'nine' (67)

Schlabach appears to restrict this variation to speakers of the Madison County dialect (5, 42). However, some of Schlabach's data suggest that this variation may be more widespread than that. These data describe a monophthongal production [æ:] or [e:] for words which other Ohio PG sources describe as [aɪ].

- (2) Schlabach data                      Data in *Es Nei Testament* (ENT)  
 /væ:/ 'because' (35)                      /vaɪ/  
 /fa:lhe:t/ 'laziness' (49)                      /vaɪshɑɪt/ 'wisdom' (affix -/hɑɪt/)

Louden (1997, 81) is the first to give an account of this change in dialects outside of Ohio. He describes the monophthongization of /aɪ/ to /e:/ as a system-internal balancing of front and back long vowels and notes that this change in progress is farther advanced in Midwestern<sup>1</sup> PG than in Lancaster County, Pennsylvania (see (3) below).

- (3) Lancaster rule: Monophthongize only before liquids  
 /aɪ/ > [e:]/\_\_\_[ɹ,l] e.g., [mɪə hɛɹ] 'we marry'  
 [aɪ] elsewhere e.g., [dɑɪtʃ] 'German'
- Midwestern rule: Retain diphthong only before unstressed central vowels.  
 /aɪ/ > [aɪ]/\_\_\_ [ə, ɐ] e.g., [mɪə hɑɹə] 'we marry'  
 [e:] elsewhere e.g., [dɛ:tʃ] 'German'

Louden's account rests crucially on a characterization of the PG vocalic system with reference to quantitative (long/short) rather than qualitative (tense/lax) differences and also on the notion of symmetry as an organizing principle for vocalic systems. I will give some consideration to the quantitative vs. qualitative nature of the PG vocalic system in the following section.

## 2 Synchronic description of PG vowels and the /aɪ/ word class

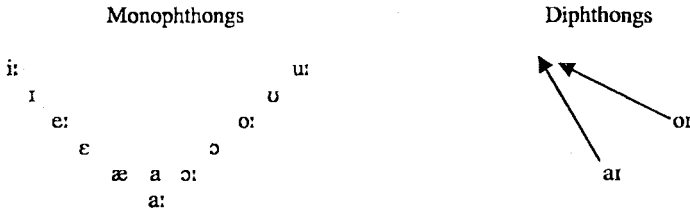
### 2.1 PG vowels

The following description of six short vowels, six long vowels, and two diphthongs is adapted from descriptions in several sources.<sup>2</sup>

<sup>1</sup> Louden's "Midwestern PG" appears to be a catch-all label for varieties of PG outside Pennsylvania, although he does not say which communities he sampled. The largest Old Order Amish, and hence PG-speaking, communities are in what is commonly considered the "Midwest": in Ohio, Indiana, Illinois, and Iowa. It is not clear, however, if PG varieties spoken in Ontario or Kansas or even central Pennsylvania, for example, are included here. In this paper, I define Midwestern PG as that of Holmes County, Ohio and Kalona, Iowa in opposition to Pennsylvania.

<sup>2</sup> Sources consulted were: Beam (1991, vi), Druckenbrod (1994, 18-19), Frey (1985, 1-2), Van Ness (1994, 422-3), Buffington and Barba (1954, 5-6), Meister Ferré (1994, 19 & 22), Van Ness (1990, 31-9), Schlabach (1980, 30-47).

Figure 1. PG Vowel Space



PG researchers have generally kept with German tradition, describing the PG vowel system as having an opposition based on quantity: a series of long and a series of short vowels. Only Van Ness (1994, 422) suggests that vowel quality is a better descriptor. However, the development of the former diphthong /au/ to present-day /a:/ provides a reasonable argument in favor of a quantitative opposition, at least for low vowels. Currently long /a:/ is in opposition to short /a/ producing minimal pairs such as /has/ 'hate' and /has:/ 'house' which differ only in length.

## 2.2 Defining the /a:/ word class in PG

The PG diphthong /a:/ is generally the reflex of Middle High German (MHG) long, high monophthongs /i:/ and /y:/, e.g., PG /ma:/ < MHG /mi:n/ 'my' and PG /na:/ < MHG /ny:rwe/ 'new'<sup>3</sup>.

I verified the status of the /a:/ word class in the lexicon of Holmes County PG by consulting two current texts: the New Testament Bible in PG, *Es Nei Teshtament* (ENT) completed by SIL translators in the mid 1990s, and *Vella Laysa* (VL), a collection of Bible stories written in 1997 by New Order Amish with some initial assistance from SIL translators. Given that the PG-speakers who served as consultants for ENT were all older men, and that it is considered a sacred text, we can assume that ENT reflects somewhat conservative norms (at least mid-20<sup>th</sup> century usage or earlier) for the community.<sup>4</sup>

<sup>3</sup> These vowels reflect the inventory of the classical period of MHG, defined as 1170-1250 AD by Russ (1982, 60). In fact, diphthongization only affected /i:/, since the round vowel /y:/ unrounded to merge with /i:/ in the Palatinate dialects (the primary input dialects to PG) as early as the end of the 13<sup>th</sup> century. Diphthongization of /i:/ to /ai/ was complete before the 16<sup>th</sup> century (Reed 471). Unlike the dialects upon which Standard New High German is based, the PG source dialects did not collapse reflexes of /i:/, with reflexes of the MHG diphthong /ei/. In PG, as in parts of the Palatinate, MHG /ei/ yields the monophthong /e:/, e.g., PG /ʃte:/ < MHG /ʃte:n/ 'stone' (Reed 1972, 472)

<sup>4</sup> One example of this is the use of <au> to represent the diphthong /au/ in spite of current norms of usage which realize this phoneme as monophthongal /a:/, e.g., <haus> for /ha:s/ 'house', <naus> for /na:s/ 'out.' A second example is the use of dative morphology in ENT. In conversational speech, dative forms are currently found only in the PG of speakers over the age of 70.

In both ENT and VL, the orthographic symbol for /aɪ/ is <ei>. Several examples are noted in Table 1 below.

**Table 1. Example words with <ei> (/aɪ/) listed according to MHG source\***

from MHG /i:/	from MHG /y:/	from loss of /r/ or /g/ in /Vri/ and /Vgi/
veisa 'show' 13*	greitz 'cross' 5	deich 'through' 4
shmeisa 'hit' 25	leit 'people' 7	reiyahra 'to rain' 13
zeit 'time' 7	frei 'free' 7	keiyah't 'married' 18
shreives 'writings' 7	eyah 'your' pl. 7	leisht 'lie (2SG)' 23
	heit 'today' 7	meiyet 'morning' 26
	Deitsh 'German' 7	shteikah 'strong' 44

\*numbers indicate page in *Vella Laysa*

I checked these words against the lexical entries in two PG-English dictionaries, Stine 1990 and Beam 1991. All words spelled <ei> in Stine and Beam are also spelled <ei> in the Ohio sources, and the same diphthongal form /aɪ/ is given in all sources<sup>5</sup>. Working from this comparison, it is reasonable to assume that lexical entries with <ei> in Stine and Beam also belong to the /aɪ/ word class in the Holmes County dialect. These dictionaries allow for the easy development of a larger corpus of /aɪ/ words for further analysis.

### 3 The Data

#### 3.1 Data collection methods and sample size/description.

During fieldwork in Kalona, Iowa (1996) and in Holmes County, Ohio (1998) I conducted one hundred forty standard sociolinguistic interviews which included a translation task. The translation task in Kalona yielded approximately five to seven tokens per speaker. The translation task in Holmes County was longer yielding approximately fifteen to eighteen tokens per speaker. I also recorded casual conversation in a number of settings in homes as a guest and/or co-worker. From these recordings I coded a total of 1187 tokens of words in the /aɪ/ word class from ninety-one speakers.

#### 3.2 Establishing variants of PG /aɪ/ and means of identifying.

In order to develop a scale by which to identify degrees of fronting, raising, and/or monophthongization of /aɪ/, I listened to approximately 50 tokens produced by five different speakers and attempted a narrow transcription which I compared against measurements of F1 and F2 in a spectrogram of the utterance.

<sup>5</sup> Approximately twenty words spelled <ei> in ENT and VL are *not* spelled so in Stine and Beam. All but one of these twenty words belong to a set of relatively recent additions to the /aɪ/ word class which are the result of intervocalic weakening and eventual loss of /r/ or /g/ as in <schtarick> 'strong' in Stine and in Beam, written as <shteig> in ENT. Thus, the /aɪ/ word class in Holmes County is larger than the one developed from Stine or Beam, because of the addition of words such as <shteig>.

The salient characteristics for distinguishing vowel quality were height and diphthongal vs. monophthongal status. With respect to measures of tenseness (peripherality in the vowel space), all of the tokens were relatively tense. I employed a four-point scale for vowel height which mirrors the low and front areas of the PG vowel space: /a, æ, ε, e/. For diphthongal status I developed a three-point scale which can be further broken down in to two parts: first monophthong vs. diphthong, and second, within the category diphthong, upgliding vs. ingliding, e.g., [æɪ] vs. [æə].

Each token received two ratings: one for height and one for di-/monophthongal quality. The higher the vowel, the more "advanced" the token in terms of change away from a low central nucleus for the diphthong. Both the monophthongs and the ingliding diphthongs can be considered "advanced" tokens in comparison with upgliding diphthongs, though some speakers produce a very salient second ingliding element—in some cases almost a syllabic element—that may represent the most advanced tokens.

Examples are given in Figure 2-Figure 5, below.

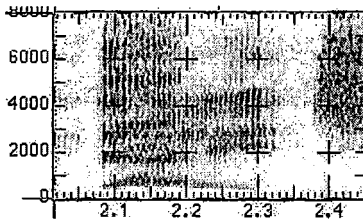


Figure 2. [ar] in /dɑrtʃ/ 'German', 30 yr old OOA male

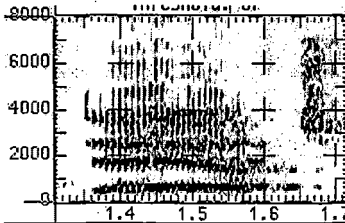


Figure 3. [æ:] in /dɑrtʃ/ 'German', 29 yr old OOA male

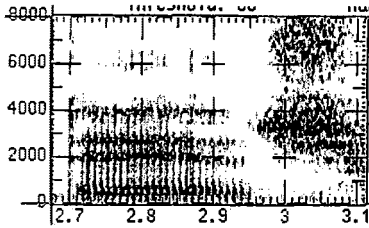


Figure 4. [ɛɪ] in /dɑtʃ/ 'German', 18 yr old OOA male

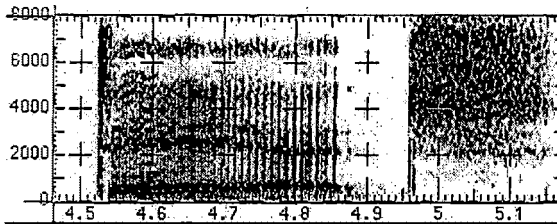


Figure 5. [æɪ] in /dɑtʃ/ 'German', 32 yr old NOA female

### 3.3 Variation

The overall distribution of the independent variables vowel height and diphthongal status can be seen in Table 2 below.

Table 2. Diphthongal status vs. vowel height for all data

	vowel height				TOTAL
	[a]	[æ]	[ɛ]	[e]	
monophthong	34	269	348	29	680
upglide	291	36	22	8	357
inglide	5	40	74	31	150
TOTAL	330	345	444	68	1187

Of the twelve possible combinations of the two dependent variables, the most frequently occurring variant is the monophthong [ɛɪ] (348/1187=29% of total tokens), followed by the conservative diphthongal variant [aɪ] (25%), and the monophthong [æɪ] (23%). Together these three token types comprise over 75% of the tokens.

So a clear pattern emerges. If a speaker does not produce the canonical [aɪ] token type, then she or he is likely to produce a fronted and perhaps raised monophthong in its

place. The following section explores the possibility that this pattern is conditioned by linguistic variables.

### 3.3.1 Linguistic variables

Each token was coded for the following independent linguistic variables:

1. language of lexical item: PG or English
2. style: translation task or free conversation
3. lexical item
4. preceding segment
5. following segment

#### 3.3.1.1 Language of lexical item

All of the recorded tokens occurred in the context of translation tasks or conversations with PG as the matrix language. Since PG borrows heavily from American English, each lexical item was coded as either PG or English<sup>6</sup>. There is a clear effect of the language of the lexical item on the vowel quality. In PG conversation, borrowed English words with /aɪ/ are rarely monophthongized and/or fronted to the common variants [æ:] or [ɛ:]. Over 70% of English words retain [aɪ] vs. only 22% [aɪ] for PG words. This finding suggests that for these bilingual speakers PG phonology and English phonology operate relatively independently of each other.

#### 3.3.1.2 Style

With respect to vowel height, the free conversation data yield slightly more conservative forms than the translation task data. That is, in free conversation, the percentage of [aɪ] tokens increased in both Kalona (from 35% to 53%) and Holmes County (from 20% to 25%). This is perhaps due to the artificial environment of the translation task where borrowed English words were less likely to appear both due to the content of the task and its purpose.

#### 3.3.1.3 Lexical item

This factor is included simply to flag any lexical entries which are unusually progressive or conservative with respect to the sound change. Several words stand out as favoring advanced variants, e.g., /gɑɪl/ 'horses,' the only lexical item for which a plurality of speakers produced [e]. Given the nature of the corpus, that being that the majority of tokens come from a few high-frequency lexical items (12 words account for

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<sup>6</sup> The distinction native vs. non-native vocabulary is very problematic in intense language contact situations such as those in all PG-speaking communities. Here the imperfect criterion used was entry in the dictionary. If a word was listed as a PG entry in Stine and/or Beam, it was labeled a PG word. Thus, some long-term borrowings are considered part of the PG lexicon, e.g., the noun *pie* and the verb *quilt*. Words with inflectional affixes (e.g., plural *-s*) were also included as native PG, while those with derivational affixes (e.g. nominalizing *-ing*, in the gerund *pricing*) were not. For words not listed in Stine or Beam the default classification was English.



approximately 75% of the total tokens) it is difficult here to separate out the possible lexical effects from effects of phonetic environment, e.g., following lateral.

**Table 3. Lexical items favoring a particular vowel height variant\***

favor [a]	/nai/ 'new,' /flaix/ 'maybe,' /ʃare/ 'barn,' /kareɪ/ 'married'
favor [æ]	/ʃmaɪst/ 'throws (3SG),' /daɪx/ 'through'
favor [e]	/tsaɪt/ 'time,' /daɪtʃ/ 'German,' /haɪt/ 'today,' /daɪ/ 'your,' /saɪ/ 'his,' /draɪ/ 'three,' /glaɪx/ 'like,' /kaɪx/ 'obeyed,' /haɪxə/ 'to obey'
favor [ɛ]	/gail/ 'horses'

\*more than five tokens and majority or plurality of tokens produced at one particular vowel height.

The words which most favor the advanced ingliding diphthong variant (inglide occurs in at least 33% of the tokens of the word) are: /tsaɪt/ 'time,' /haɪt/ 'today,' /laɪt/ 'people,' /daɪtʃ/ 'German,' /gail/ 'horses,' /naɪn/ 'nine.'

### 3.3.1.4 Preceding and following phonetic conditioning

The segments were coded for preceding and following segmental environments. The nature of the following segment affects the frequency of occurrence both of vowel height and di-/monophthongal quality. In Table 4 and Table 5 a (+) means that there was above-average frequency of the dependent variable in that phonetic environment, a (-) means below-average frequency, and a blank indicates no effect either way. Some strongly disfavoring environments are noted by the label "Ø tkns" which means that no tokens were found in these environments.

**Table 4. Effect of following phonetic environment on vowel height**

	[ə] or [ɐ]	labial	coronal	palatal	velar	glottal	nasal	morph bndry
[a]	+	+						
[æ]	Ø tkns		+	-		Ø tkns	+	
[e]				+	+			
[ɛ]	Ø tkns	-	+			Ø tkns		-

**Table 5. Effect of following phonetic environment on diph-/monophthongal quality**

	[ə] or [ɐ]	labial	coronal	palatal	velar	glottal	nasal	morph bndry
monop								+

upglide	+	+	-	-	+	∅ tkns	-
inglide	∅ tkns	∅ tkns	+	+	+		+

A following unstressed vowel favors the conservative [aɪ] variant, which supports Louden's (1997) analysis (see section 1). Labials also favor the [aɪ] variant. The most common variants [æ:] and [e:] are favored by following coronals and palatals respectively. The very advanced form [eə] also is favored by coronals (especially lateral segments) and strongly disfavored by following labial or velar segments. Preceding and following nasal segments favor the [æ:] variant and ingliding variants [eə] and [æə].

Again, the presence of several high-frequency lexical items in the corpus is cause for caution in interpreting the above findings. The apparently significant effect of phonetic environment might possibly be a lexically-restricted phenomenon.

### 3.3.1.5 Is the variation of /aɪ/ regular?

The evidence for strictly phonetically conditioned variation is not conclusive since we lack sufficient tokens of particular phonetic environments across different lexical items (particularly preceding /l/ which appears to favor advanced tokens). Still, the data in the preceding section suggest that variation in the production of /aɪ/ is subject to a certain amount of predictable linguistic conditioning, typical of a regular sound change in progress.

### 3.3.2 Social variables

Each speaker was coded for the following social variables:

1. Community: Kalona, Holmes County, or Pennsylvania (one speaker).
2. Age: a continuous variable which was recoded into four generational cohorts of twenty years each: 0-20, 21-40, 41-60, 60+.
3. Sex: female or male.
4. Denomination: Old Order Amish, New Order Amish, Beachy Amish, Conservative Mennonite, Mennonite.
5. Job: retired, homemaker, factory, office, farmer, student/teacher, small business.
6. Work network: There were three in the Holmes County study. Laborers at the main woodworking factory, office workers at the factory, and installation workers at the factory.
7. Church network: This is basically a geographical measure, since for the most part the Amish go to church with their neighbors. There are 21 of these networks represented, 13 of which are Amish.
8. Family network: There are six families which have three or more members included in the study. There are an additional five which have at least two.
9. Dative usage: Individual's use of tokens of dative morphology in the translation task (part of a previous study) was entered as a continuous variable. This was done in order to test whether conservative usage of a morphological variable (dative case) correlated to conservative usage of a phonological variable (i.e., /aɪ/).

The variables "job," "church network," "family network," and "dative usage"<sup>7</sup> did not reveal any significant correlations with variation in the dependent variables. The other variables are discussed below.

### 3.3.2.1 Community

Although all variants are present in both Kalona and Holmes County, the frequency of occurrence differs between the two communities. The ranking of variants from most frequent to least is:

Holmes County, Ohio	[e] > [æ] > [aɪ] > [e]
Kalona, Iowa	[aɪ] > [æ] > [e] > [e]

While Holmes County speakers most frequently produce an advanced form, [e], Kalona speakers favor the conservative form. The single speaker from Pennsylvania produced only [aɪ] tokens.

In terms of the borrowed English tokens, the Kalona speakers almost categorically retain the canonical variant [aɪ] (95%), while Holmes County speakers do so in only 52% of possible cases. This finding suggests that the restriction on incorporating English lexical items into PG phonology is much stronger in Kalona than in Holmes County.

### 3.3.2.2 Age

Age is strongly negatively correlated with the production of advanced variants. For age against vowel height, the Pearson correlation coefficient is  $r = -.462$  and the  $r^2 = .214$ , which means that over 21% of the variation in vowel height can be accounted for by variation in age (and this despite the fact that vowel height as coded in this study is not truly a scalar numeric variable). Speakers over the age of 60 produce [aɪ] in two-thirds of their tokens. For speakers under the age of 60, the average frequency of [aɪ] tokens is less than 20%. Also speakers under the age of 40 produce a disproportionate number of the very advanced tokens, e.g., [eə].

This pattern holds true for both Kalona and Holmes County, although in every age cohort, the Kalona speakers have fewer advanced tokens than their Holmes County counterparts. These data suggest that Kalona lags behind Holmes County, by perhaps a generation, in the advancement and adoption of this sound change. A larger sample of free conversation is needed to confirm this and to rule out the possibility that the translation tasks, which differed somewhat in the two communities (see section 3.1), did not restrict the lexical and segmental environments for the Kalona tokens.

<sup>7</sup> This is true for dative usage only after another independent variable, "age," is factored out. There was a positive correlation between production of a high percentage of dative forms and production of a high percentage of [aɪ] variants. But the real correlation here is between both of these linguistic variables and the social variable age, see section 3.3.2.2.

### 3.3.2.3 Sex

In general, women produce fewer conservative tokens and more advanced tokens than men, but this phenomenon is limited to the two middle age cohorts 21-40 yrs and 41-60 yrs. The oldest and youngest age cohorts show few gender-correlated differences. Most remarkable is the relatively high percentage (17%) of very advanced tokens, e.g., [e], produced by women in the 21-40 year-old cohort. No other age group female or male produces more than 9%.

### 3.3.2.4 Denomination

The variable denomination singles out the New Order Amish who have significantly higher percentages of conservative [aɪ] tokens (over 50%) as well as a high number of advanced [e] tokens (10%). This bimodal distribution appears to be the result of a data sample dichotomy among the NOA in which two groups predominated: old, male church leaders, and young, female, office workers.

Comparing the Old Order Amish across communities reveals that the youngest age cohort (0-20 years old) have identical patterns of high [ɛ] usage and low [aɪ] usage in both Kalona and Holmes County. There are significant differences in the older generations. In Holmes County the middle-age cohorts share the pattern of the youngest generation, while the over 60 generation differs dramatically with high [aɪ] usage. By contrast, in Kalona, there is steadily increasing usage of the conservative [aɪ] variant in each generation as age increases.

### 3.3.2.5 Social networks: church, work, family

The office worker network consisting of about fifteen persons (eight are represented in this study) working in two offices with considerable English customer contact produced significantly more advanced tokens for vowel height: over 60% were either [ɛ] or [e]. Since four of the eight office workers in this network study are Amish women in the 21-40 age group, it is possible that age, sex, and denominational factors interact with the network variable.

The comments of one speaker gave reason to expect a possible geographical network correlation. He noted the advanced ingliding tokens [eə] and [eɔ] ("almost like they put an extra vowel in there") and when asked what person or group of persons use these advanced variants, he identified a particular group of young women in the section of the factory that he formerly worked in. These women, he speculated, mostly came from the same area in the county. However, the church/geographical network results did not show such a correlation.

### 3.3.3 Summary of Variation

Although variation in the production of the of the phoneme /aɪ/ has linguistic correlates, the strength of the effect of the social variable "age of speaker" overwhelms these correlations as well as other social correlates. Regardless of phonetic environment,

the younger the speaker, the less likely it is that the conservative [aɪ] variant will be produced. Over half (52%) of the tokens of the most advanced variant, [eə], were produced by women in the 20-40 age group. In the following section I will analyze the potential for advanced tokens such as [eə] to effect phonemic change.

#### 4 Incipient phonemic merger: production and perception

To evaluate the possibility of phonemic merger, we must first consider how the variation in /aɪ/ may produce tokens which overlap the vowel space of other PG phonemes. Although in terms of quality both short /æ/ and short /e/ would appear to show some overlap with /aɪ/, the length difference of /aɪ/ appears salient enough to avoid mergers with these two vowels. A more likely candidate is the long vowel /eɪ/.

##### 4.1 Commutation test

To test a potential merger of the phonemes /aɪ/ and /eɪ/, I created a commutation test (Labov 1994, 356). The corpus for the commutation test was fashioned by selecting the minimal pair /gaɪ/ 'horses' and /geɪ/ 'yellow' and randomizing twelve occurrences of each word in a single list. This produced a single list of twenty-four words which a native speaker then recorded for me. Since few PG speakers read PG, I used pictures to elicit the words. Finally, twenty words from the list of minimal pairs were played back to the person who recorded them (beginning on the third token and ending on the twenty second token to help ensure that the listener did not memorize the order of recording) and the person was asked to identify which word she or he had said (i.e., either 'horses' or 'yellow') for each token. If the person is unable to do so above the level of chance (50%), then we have convincing evidence of (near) merger phenomena. The evidence from the commutation test is particularly compelling, since speakers rate their own speech from a highly focused task in which the fact that minimal pairs are being elicited is obvious.

A second commutation test was created using the minimal pair /saɪ/ 'pigs' and /seɪ/ 'sea.' Both of these commutation tests were administered to five Holmes County PG speakers. I selected speakers under the age of 40, since my earlier quantitative data showed them to be most likely to produce advanced /aɪ/ variants. The results are given below in Table 6.

**Table 6. Percent correct on commutation tests**

speaker/listener (age, sex, denomination)	/gail/ 'horses' vs. /ge:ɪ/ 'yellow'	/sai/ 'pigs' vs. /se:/ 'sea.'	TOTAL % correct
1. 30, male, New Order Amish	20/20 100%	20/20 100%	40/40 100%
2. 31, female, New Order Amish	20/20 100%	20/20 100%	40/40 100%
3. 32, female, Beachy Amish	20/20 100%	20/20 100%	40/40 100%
4. 32, female, New Order Amish	19/20 95%	15/20 75%	34/40 85%
5. 16, male, Old Order Amish	20/20 100%	20/20 100%	40/40 100%

Four of the speakers correctly identified all forty of their utterances. Of interest here is the one speaker who did not: speaker #4. This 32-year-old New Order Amish woman works in the office of a woodworking factory and earlier conversations with her had given me the impression that she is among the most advanced in her production of /aɪ/. The results of the commutation test show that clearly there is significant overlap in the phonetic space comprising the phonemes /aɪ/ and /eɪ/ for speaker #4.

In the /gail/ vs. /ge:ɪ/ test she misidentified one word, but for the /sai/ vs. /se:/ test she incorrectly identified five words. Given that random guessing should yield a 50% correct score, her score of 75% is strong indication that for her, these phonemes are nearly merged. Her mistakes, however, were not completely random. In each of her errors she misidentified an /aɪ/ token as /eɪ/.

#### 4.2 Cross-checking and extending the results of the commutation test

##### 4.2.1 Commutation test cross-check

In order to verify that speaker #4 did not simply have perceptual difficulties, I had five other speakers listen to speaker #4's commutation test tokens.

**Table 7. Cross-check: Speaker #4 commutation test with other listeners**

listener (age, sex, denomination)	/gail/ 'horses' vs. /ge:ɪ/ 'yellow'	/sai/ 'pigs' vs. /se:/ 'sea.'	TOTAL
A. 37, male, Beachy Amish	17/19 89%	13/19 68%	30/38 79%
B. 31, male, Beachy Amish	19/20 95%	18/20 90%	37/40 93%
C. 64, female, Beachy Amish	18/20 90%	18/20 90%	36/40 90%
D. = Speaker #2 (see Table 6)	19/20 95%	20/20 100%	95/100 95%
E. 65, female, New Order Amish	17/20 85%	17/19 89%	34/39 87%
TOTAL other listeners	90/99 91%	86/98 88%	176/197 89%
TOTAL including Speaker #4	109/119 92%	101/118 86%	210/237 89%

The results in Table 7 confirm a (near) merger of these vowels in the production of Speaker #4. Listeners are good—but, not perfect—at distinguishing Speaker #4's /aɪ/ vs. /eɪ/. A roughly equal number of /aɪ/ and /eɪ/ tokens were misidentified and errors were scattered across 9 of 20 tokens for /gaɪ/ vs. /geɪ/ and across 13 of 20 tokens for /saɪ/ vs. /seɪ/.

As a control, four listeners (B, C, D, and E) also listened to Speaker #2's commutation test. This check yielded only one error: 159/160 (99%) correct.<sup>8</sup>

At least one listener, Listener A, commented that it was very difficult to distinguish /aɪ/ from /eɪ/ in speaker #4's speech and he seemed surprised by the difficulty. He maintained that most speakers would not overlap the two phonemes in this manner.

### 4.3 Minimal pair test

I also had listeners listen to fifteen tokens of minimal pairs taken from sentences spoken by speaker #4 and speaker #2. The sentences had been elicited in an earlier translation task.

**Table 8. Minimal pairs extracted from translation tasks of Spkr #2 and Spkr #4**

/aɪ/ word class		/eɪ/ word class	
me: maɪl	'more miles'	me me:l	'more flour'
vais	'white'	'[ix] ve:s	'[I] know'
main	'mine'	'[ix] me:n	'[I] mean'
sai vase	'his water'	se: vase	'sea water'
[ix] bais	'[I] bite'	[ix bin] be:s	'[I m] angry'
drei	'three'	dre:	'curve'

For each of these fifteen tokens listeners were asked to indicate which word from the minimal pair they heard, e.g., "Did you hear *more miles* or *more flour* or something else?"

<sup>8</sup> Listener A listened only to several tokens from the commutation test of speaker #5 and had "no problem" correctly identifying the tokens.

**Table 9. Minimal pairs test results: number correct/total**

Listener	Speaker #2		Speaker #4		TOTAL	
A. 37, male, Beachy Amish	4/6	67%	8/9	89%	12/15	80%
B. 31, male, Beachy Amish	6/6	100%	6/9	67%	12/15	80%
C. 64, female, Beachy Amish	6/6	100%	4/9	44%	10/15	67%
D. = Speaker #2 (see Table 6)	6/6	100%	6/9	67%	12/15	80%
E. 65, fem., New Order Amish	1/2	50%	2/2	100%	3/4	75%
TOTAL	23/26	88%	26/38	68%	49/64	77%

Again listeners have difficulty distinguishing tokens produced by Speaker #4. Listeners do better—but are not perfect—at distinguishing tokens produced by Speaker #2. There was a pattern to listeners' errors: 10 of 15 mistakes are /e:/ misidentified as /a:/. Three words were misidentified three times each: /ve:s/ '[] know', /be:s/ 'mean', and /me:n/ '[] mean.'

#### 4.4 Production of nearly merged sounds: acoustic measures.

In near-merger phenomena two different vowels are produced in a manner which causes them to be perceptually identical or nearly so. Yet acoustically significant differences may remain. Faber and Di Paolo 1995 suggest first testing for significant differences across several acoustic dimensions, then, if necessary, considering all of these dimensions simultaneously.

For the tokens in the commutation tests of speakers #2 and #4, formant measures were taken at early, mid, and late points in the vowel (roughly at 20%, 50%, and 80% through the duration of the vowel). The acoustic dimensions tested were duration of the entire vowel, F1, F2, and change in F1 and in F2 from midpoint to late point in vowel. The average formant tracks for both speakers are given in Figure 6 and Figure 7.



Figure 6

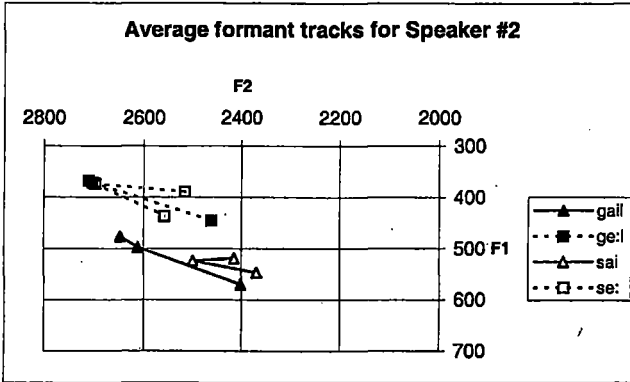
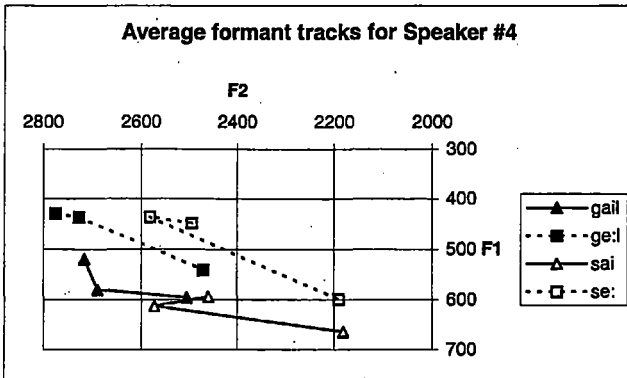


Figure 7



An ANOVA revealed a significantly higher F1 for /e:/ as opposed to /a:/ at all points in the vowel for both speakers. Measures of F1 of the same vowel across different words (i.e., /ge:l/ vs. /se:/) reveals no significant differences. (See Table 10 below in which only those differences which are not significant at <.05 are in bold).

**Table 10. Tukey HSD post-hoc comparisons of ANOVA of commutation test**

minimal pair	measure		Speaker #2	Speaker #4
/gail/ vs. /ge:l/	F1	early	<.001	<.001
		mid	<.001	<.001
		late	<.001	.026
	F2	early	.130	.117
		mid	.042	.469
		late	.355	.735
		Δ F1	1.000	.012
		Δ F2	.845	.320
		duration	<.001	.332
/sai/ vs /se:l/	F1	early	<.001	<.001
		mid	<.001	<.001
		late	.001	.007
	F2	early	<.001	.521
		mid	<.001	.985
		late	.002	.991
		Δ F1	.008	<.001
		Δ F2	.441	.995
		duration	.024	<.001

Thus, for both speakers we have a clearly measurable difference in production (F1) despite the fact that other acoustic measures—most notably F2—do not differ significantly between /e:/ and /a:/ for both speakers. This runs counter to the observation that vowels in near-mergers commonly differ along F2 *not* F1 (Labov, 359).

There is no consistent measure which distinguishes the production of near-merged vowels by Speaker #4 from the relatively clearer production of Speaker #2. For the /gail/ vs. /ge:l/ pair, the longer duration of the vowel in /gail/ may play a role. Duration is not significant for the /sai/ vs. /se:l/ pair, however for this pair Speaker #4 does not produce a significant difference in F2 measures at all points across the vowel.

The same basic pattern holds for the minimal pair test data: there are significant differences in F1 for /e:/ and /a:/ for both speakers at all points in the vowels. But duration and F2 do not differ significantly between /e:/ and /a:/ for both speakers. There is no clear acoustic cue to which we can attribute listeners' confusion on the minimal pair test.

#### 4.5 Is phonemic merger underway?

A "near-merger" is defined as a contrast which speakers reliably produce but which they cannot reliably perceive (Labov 1994, 349-70). It is perception then, or rather the limits of perception, which drives the near merger process and the potential for

complete phonemic change. The results described in sections 4.1 and 4.2 clearly show that at least one speaker has partially merged the phonemes /aɪ/ and /eɪ/. Furthermore, native speaker-listeners were unable to consistently distinguish these phonemes in the speech of at least two Holmes County speakers. If we accept the relatively safe assumption that these two speakers are not unique in Holmes County, then we must also accept that continued spread of the advanced variants of /aɪ/ could lead to phonemic merger with /eɪ/.

Language contact may play a role in the retention or re-establishment of this phonemic contrast. English borrowings with /aɪ/ are resistant to monophthongization and raising, and are thus a constant source of renewal for the phoneme.

## 5 The origins of variation and change in the PG diphthong /aɪ/

Up to this point I have described the variable production of the PG diphthong /aɪ/, the linguistic and social conditioning that this variation is subject to, and the possibility of phonemic merger with /eɪ/. In this section, I will analyze four possible accounts for the introduction of this variation into the PG of Holmes County and Kalona. First I will consider two accounts based on dialect contact and language contact. Then I will consider two accounts based on motivations internal to PG.

### 5.1 External accounts: dialect contact or language contact

Dialects often differ in the phonetic details of a common phonemic inventory. When this is the case and speakers of the dialects are in contact with each other, it is possible that a particular dialectal variant will come to mark a particular sociolinguistic identity in a community and thus serve as a basis for change. Labov's study of variation in production of the American English diphthong /aɪ/ in Martha's Vineyard is a classic example.

There is some evidence to suggest that dialect borrowing/variation, at least at the lexical level, is already present in PG. The list of eight words in Table 11 are entered in Stine's 1990 dictionary as doublets having both /aɪ/ and /eɪ/ as possible pronunciations.

**Table 11. Doublet entries in PG dictionary with /aɪ/ and /eɪ/ alternates**

STINE listing	definition(s)	Modern German cognate
ʃardə / ʃeɪdə	to separate	scheiden
hailing / heɪling	cave (hollow)	Höhl-ung
lard / leɪd	suffering (sorrow, mourning)	Leid
laɪft / leɪft	molding, slat	Leiste
maɪglɪx / meɪxliɪx	probably	möglich
rais / reɪs	journey	Reise
ʃvai / ʃveɪgə	sister in law (brother in law)	Schwägerin (Schwager)
saine / seɪnə	sift (strain)	sehen

All of the words in the above table reflect MHG vowels /ei/ and /œ/ which yield /e/ regularly in PG. This then is not an example of the precise kind of dialect borrowing that we are looking for to describe the variation in /aɪ<sup>9</sup>, but it *is* evidence of dialect borrowing contributing to variation in PG.

In order to explore the possibility that dialect contact within PG might account for the current change in the vowel system, we must trace the development of PG /aɪ/ back to its MHG origins. Then we must examine the reflexes of these MHG vowels in the source dialects. It may be that several different reflexes of MHG vowels—reflecting the varied source dialect inputs to PG—have continued to co-exist in PG and thus have provided a model or target for the change of /aɪ/ to /æ:/ or /e:/ or something else. The basis for such a model could simply be phonetic differences in production of the phoneme represented by /aɪ/.

### 5.1.1 Dialect contact: development of PG /aɪ/ word class from MHG and corresponding reflexes in PG source dialects.

The source dialects selected for comparison with PG in this study are: the Palatine dialect (Pfälzische) which is generally considered the most influential dialect in the genesis of PG<sup>10</sup>, and two other dialects whose speakers are fairly well-represented among the early Anabaptist settlers in Pennsylvania and eventually Holmes County: Alsatian and Swiss, i.e. Low and High Alemannic.

Middle High German (approximately 13<sup>th</sup> century) provides the starting point for the development of these modern German dialects. Since the formative period for PG was approximately five hundred years later in colonial America (1683-1776), the relevant changes from MHG are those which took place between the 13<sup>th</sup> and the mid-18<sup>th</sup> centuries.<sup>11</sup> In most of the source dialects, the phonemic distinctions during this time period are fairly well understood, and have not changed considerably since that time period. Of course, the same cannot be said for the phonetic details<sup>12</sup>, but we must make do with the imperfect and partial data that we have.

As noted in above, the PG /aɪ/ word-class comes primarily from diphthongization of the MHG long, high vowels /i:/ and /y:/. This change reflects similar changes in the Palatinate dialects. In the Alemannic dialects these MHG vowels remain monophthongs.

<sup>9</sup> The type of doublet that would be of most interest here is one involving MHG /i:/ having reflexes of both /aɪ/ and /e:/.

<sup>10</sup> See, e.g., Raith 1992, Reed 1972, Van Ness (1994, 421).

<sup>11</sup> German immigration to America resumed in the 19<sup>th</sup> century and a number of Amish and Mennonites came to America during that time. It is generally assumed that these later arrivals had little or no impact on the structure of PG. This may, in fact, be true for larger, older communities such as Holmes County. But in some of the smaller, newer communities, (e.g. Alsatians in Fulton County, NW Ohio and certainly the Swiss in Adams County, IN, see Thompson 1994) it may be that 19<sup>th</sup> century arrivals *did* leave some mark on the language, since they would have made up a sizeable minority or even majority in these settlements. The question of the impact of 19<sup>th</sup> century immigration will not be addressed in this paper.

<sup>12</sup> Russ (1982, 162) notes that the quality of the diphthong /aɪ/ can vary in current dialects from [ae] to [ei] and [ei].

The developments of MHG vowels in the source dialects and PG are summarized in Figure 8 below.

**Figure 8. Development of MHG vowel /i:/ in non-Palatinat dialects and PG<sup>13</sup>**

MHG	i: (includes merged y:)
Alsatian	i:, also ej in hiatus
Swiss: Berne	i: and y: (no merger); also ɛɪ in hiatus
PG and Palatinat	aɪ (and e: in Midwest PG); also oɪ in hiatus

Both Alsatian and Bernese Swiss retain the MHG monophthong, /i:/, and there is no direct model for Midwestern PG [e:] in either Alsatian or Bernese Swiss. Also, the range of variation within Midwestern PG includes monophthongal [æ:] as well as diphthongal [aɪ] and [eə], but *no* speakers produce [i:]. Finally, although the Alemannic dialects both have diphthongal variants in hiatus position (defined by Keller as preceding a pause or a glide), this is precisely the position where PG also has undergone a different sound change the outcome of which does not figure into the discussion of /aɪ/. Lacking any further details of the phonetics of 18<sup>th</sup> century Alemannic and PG, it appears unlikely that Alsatian or Swiss dialectal influence has played a role in this change.

### 5.1.2 Contact with English

Holmes County PG speakers are in increasingly intense contact with English speakers some of whom speak a midland variety of American English in which the diphthong /aɪ/ is often monophthongized to low and slightly fronted [aɪ], e.g., 'right' pronounced as /rait/. However, PG speakers overwhelmingly produce English words with diphthongal [aɪ] (see section 3.3.1.1), so contact with English, can be safely ruled out as a catalyst for monophthongization in PG.

## 5.2 Internal accounts: symmetry or drift

### 5.2.1 Restoring symmetry

Louden (1997) suggests that the monophthongization of /aɪ/ is internally motivated by an imbalance in the phonetic space of the long vowels in PG.

<sup>13</sup> The data on Alsatian and Bernese Swiss are taken from Keller 1961:125 and 92 respectively.

**Figure 9. PG long vowels**

i:  
 e:  
 a:  
 o:  
 ɔ:  
 u:

Louden (1997, 81) observes that the long vowel series includes three back, round vowels and only two front vowels (with /a/ occupying a low central position). He claims this asymmetry is rectified by the monophthongization of /a/ to /ɛ:/ which then occupies a low front position opposite the back vowel /ɔ:/ (the outcome of the monophthongization of the diphthong /au/). This account rests on at least two assumptions: that oppositions based on length are salient in PG and that asymmetrical vowel spaces are inherently unstable.

As noted in section 2.1, there is ample evidence to suggest that, at least for the low vowels, distinctions based on length are crucial. However, the putative inherent instability of asymmetrical vowel spaces may be challenged on several counts.

**Figure 10. Klamath (Penutian)**

i  
 e  
 a  
 o

**Figure 11. Dialectal German**

i:  
 e:  
 ɛ:  
 a:  
 u:  
 o:

First, there are languages with unevenly distributed vowels, e.g., Klamath, a Penutian language which lacks high back round /u/ in opposition to /i/; also dialectal German, which has an asymmetry opposite that of Figure 9 in that it lacks a low back /ɔ/ as a counterpart to long front /ɛ:/ (Hock:155). If even one generation of speakers acquires and maintains an asymmetrical system of this type, then we are obliged to reason that such a vowel system could exist as a stable system in any language for an indefinite period of time.

Second, languages with symmetrical vowel systems often undergo changes which eliminate the symmetry, e.g., Early Attic-Ionic which fronted the high back vowels resulting in a system with a three height contrast in the front vowels and only two in the back vowels (Hock:155).

Figure 12. pre-Attic-Ionic

i: i	u: u
e: e	o: o
ɛ:	ɔ:
a a:	

Figure 13. Early Attic-Ionic

i: i	y: y	
e: e		o: o
ɛ:		ɔ:
a a:		

Still, a weakened version of Louden's argument still holds. That is, the arrangement of the articulatory and perceptual space for PG long vowels is such that there is a "vacancy" for an additional long, low, front vowel. While /a/ is a likely candidate to fill this vacancy, it is certainly not obliged to do so by some principle of vowel space symmetry<sup>14</sup>. Probability is not the same as causation. Precisely what phoneme is most likely to fill this spot at a given point in time is subject to notions such as the naturalness of sound change and phonetic drift.

### 5.2.2 Drift

Low-level phonetic variation is a natural part of any language and can be heard in the speech of any one person at different points in time and between persons belonging to different social networks. Occasionally the cumulative nature of this variation across a speech community results in a phonetic change in a particular direction, a phenomenon Sapir labelled "drift" (1921:150, also Hock 1991:634).

In current continental German dialects, the phonetic realization of /a/ can vary from [æ] to [ei] and [ɛi], and in Swabian (North Alemannic) variation can be seen in the orthography: *Zeit, Zait, Zoit, Zuit, Züat*, 'time' (Noble 1983:62 and Russ 1982:162). The dynamic nature of the phonetic realizations of diphthongs in the dialects suggests that these diphthongs are subject to relatively rapid change internal to the system without any recourse to external pressures of dialect or language contact.

Furthermore, the direction of movement here—raising a long low vowel to a mid or high front vowel—has been observed in English, German, Greek, and Albanian, among other Indo-European languages (Labov 1994:116, 122). Another example of this type of change can be seen in the so-called secondary diphthongization in French where the putative change [ai] > [e] occurs in such forms as Latin *lacte* 'milk' > [lait] (10<sup>th</sup> century) > [let] (11<sup>th</sup> century).

In both the history of German and the history of English long vowels and diphthongs have undergone changes similar to the changes described for PG /a/. For example, in southern American English /a/ is produced as fronted [aɪ], which, in terms of

<sup>14</sup> I am not arguing here that maximum perceptual contrast between vowels, which often leads to a more or less symmetrical vowel space, is not a principle in the structuring of vowel systems (see Liljencrants and Lindblom 1972). I am arguing that there is no single optimal configuration which yields maximal perceptual contrast for a given vowel system. Indeed, Louden's account would be strengthened if it were framed in terms of perceptual contrast rather than "symmetry."

phonetic space, is not far removed from the PG variant [æ:]. Both the Middle High German vowel shift and the Great Vowel Shift in Early Modern English involved the fronting and/or raising of long vowels (Labov 1994:124, 145).

Supporting evidence can also be found in studies of vowel coalescence. Cross-linguistic patterns of coalescence, the resolution of two adjacent vowels into a single vowel containing properties of both input vowels, demonstrate that sequences of low vowel + high front vowel (often across morpheme boundaries) are reflected in surface forms by the lowest front vowel in the language's inventory (Parkinson 1996:93-95). In PG this lowest front vowel could be either [æ] (a phoneme found primarily in English borrowings) or [ɛ]. These two vowels are the most frequently occurring monophthongs in Table 2, p.149.

What we observe, then, in Holmes County PG, appears to be change due to normal, internal variation in the language. Moreover, it is change of a relatively typical sort: the monophthongization and subsequent raising of the diphthong /aɪ/.

### 5.3 Spread of a sound change in PG

Within both the Holmes County and the Kalona communities, we see a sound change that is being led by the younger generations (see section 3.3.2.2). Within the younger generation in Holmes County, women who are employed in business offices appear to be leading the way in producing the most divergent variants. We can only speculate on the social motivations for doing so. Perhaps it is to mark oneself as "modern" within the constraints of Amish culture by speaking differently from "old-fashioned" PG speakers.

It is not clear whether young women have led the way throughout in the genesis and spread of this sound change. However, given that the economic opportunities afforded young women today are new to the community in the last part of this century, it seems unlikely that women in an earlier period would have had precisely the same social motivations. It is also unclear what social significance this variant in the speech of young women had/has in the wider community that would lead to it being adopted by others.

The quantitative data in section 3.3.2.1 suggest that the change of /aɪ/ from [aɪ] to [ɛ:] is not proceeding at the same rate in Holmes County and Kalona. Furthermore, Louden suggests that the nature of the change differs substantially between the Midwest and Pennsylvania.

The changes in these three communities may share a common origin. If so, then we must account for how the change has spread from the community of origin to other communities. If not, then we must posit three parallel but independent changes. This latter hypothesis is certainly possible; however, given the striking similarities between especially the Midwestern communities, it seems more plausible to link the variation in Kalona and Holmes County as part of a single phenomenon. In the last section, I discuss



the ensuing difficulty in accounting for the spread of linguistic change between language islands.

## 6 Conclusion

I have presented data which confirms that a sound change which monophthongizes the PG diphthong /aɪ/—yielding /æ:/ or /e:/—is in progress in two Midwestern Amish communities. Holmes County, Ohio speakers have advanced the sound change more than Kalona, Iowa speakers, but in both communities younger speakers (below age sixty) use monophthongal variants almost exclusively. The change is subject to some linguistic conditioning.

Perception experiments in Holmes County demonstrate that the most advanced tokens of this sound change, produced primarily by younger female office workers, are merging with the long mid-front vowel /e:/.

I suggest that this sound change is not the result of language or dialect contact or of system-balancing change, but rather, is simply an example of a relatively common type of language "drift."

This study delivers a proliferation of questions at its conclusion, among them:

- What is the nature of the spread, both in perception and production, of incipient phonemic merger or near-merger phenomena?
- Can the number of phonetic variants in the study be reduced from twelve (in Table 2) to just two or three that have clear sociolinguistic salience in the communities? How would this then change the patterns of variation?
- What can the restriction of this sound change to PG lexical items (vs. English) tell us about the (im)permeability of phonology in language contact and about the organization of phonology in code-switching and in the speech of bilinguals?
- What is the minimal level and means of interaction needed between dialect/language islands in order to maintain a high degree of linguistic homogeneity?

I will comment briefly on the last question.

The relative isolation of a speech community has long been recognized as a factor in both the development and maintenance of linguistic diversity. Conversely, geographic and social mobility have been understood as catalysts for the spread of changes and the eventual homogenization of dialects across a given region. Chambers (1995:66) calls the respective effects of isolation and mobility "natural linguistic laws."

While mobility and the resultant contact between speakers most often occurs between geographic neighbors, research in language and dialect contact has shown that interaction can occur between distant locales with little or no impact on intervening communities. Trudgill notes the spread of uvular /r/ between urban centers in Europe (1983:52,62) as well as the diffusion of the loss of /h/ from London to urban centers in East Anglia (1986:44-6). The homogeneity of African-American Vernacular English

across distant urban areas has also been noted in, among others, Fasold's study of the AAVE tense system comparing Washington D.C., New York, and Detroit (1972:219).

The primary difference between these examples and the study at hand is that, in the case of PG, we are studying *language* islands separated by regions inhabited by speakers of a different language, whereas the studies noted above (with the exception of the spread of uvular /r/ across dialects and languages) are concerned with *dialect* islands in which the intervening spaces are occupied by speakers of a mutually intelligible dialect of the same language. Still, the same principles should hold: mobility between islands will bring about homogeneity, isolation between the islands will encourage differentiation.

The fact that PG is "remarkably homogeneous" across geographical space (Van Ness:421) appears to be a violation of Chamber's "natural linguistic laws" of separation and mobility. Amish communities in the United States are scattered from Delaware to Montana, separated from each other by hundreds of miles and crucially lacking convenient access to modern means of transportation and communication. How have these apparently insular Amish communities—particularly in the Midwest—maintained a relatively uniform language, even down to the details of a particular sound change, for nearly a century and a half?<sup>15</sup>

Given, first, that the acquisition and spread of language generally occurs only via regular, face-to-face interactions between speakers and, second, that these Amish settlements have experienced nearly one-hundred fifty years of comparative geographic isolation, we would expect at least several dialects of Pennsylvania German to emerge (e.g., Ohio PG, Indiana PG, Iowa PG, etc. or rather Holmes County PG, Geauga County PG, etc.). The development of a relatively uniform Midwestern PG variety across these widely scattered speech islands remains something of an enigma.

If separation and mobility are indeed crucial factors or "laws" governing the spread of language change, then we are obliged to assume that these distant Amish communities are not as separated or immobile as they seem. They must interact in significant ways that are not visible to the newcomer. Multiple factors such as migration for economic, social (i.e., marriage), or religious (i.e., divisions and unions in church structure) purposes, visiting relatives, and even increased use of the telephone may play a role. Determining the precise nature of these interactions is a primary goal of future study.

## References

- Beam, C. Richard. 1991. *Revised Pennsylvania German Dictionary: English to Pennsylvania German*. Lancaster, PA: Brookshire Publications.

<sup>15</sup> What is more, the change in /a/ is not the only parallel between the PG in Holmes County and Kalona. These communities pattern almost identically with respect to domains and degree of loss of dative case morphology across all age groups. See Keiser 1997.

- Buffington, Albert F. 1939. Pennsylvania German; Its Relation to Other German Dialects. *American Speech* 14:276-286.
- Buffington, Albert F. and Preston Barba. 1954. *A Pennsylvania German Grammar*. Allentown: Schlechters.
- Chambers, J. K. 1995. *Sociolinguistic Theory*. Cambridge, MA: Blackwell.
- Druckenbrod, Richard. 1994. *Mir Lanne Deitsch*. *Es Nei Testament*. n.d. Committee for Translation. Sugarcreek, OH. South Holland, IL: The Bible League.
- Faber, Alice and Marianna Di Paolo. 1995. The Discriminability of Nearly Merged Sounds. *Language Variation and Change* 7, 35-78.
- Fasold, Ralph W. 1972. *Tense Marking in Black English*. Arlington, VA: Center for Applied Linguistics.
- Frey, J. William. 1985 (1942). *A Simple Grammar of Pennsylvania Dutch*. Lancaster, PA: Brookshire.
- Green, W.A. I. 1989. The Dialects of the Palatinate (Das Pfälzische). *The Dialects of Modern German*, ed. by Charles V.J. Russ, 241-264. Stanford: University Press.
- Hock, Hans Henrich. 1991. *Principles of Historical Linguistics*. Berlin: Mouton de Gruyter.
- Keller R. E. 1961. *German Dialects: Phonology and Morphology*. Manchester University Press.
- Keiser, Steven Hartman. 1997. "From the Farm to the Factory: Divergence in Pennsylvania German?" presentation at New Ways of Analyzing Variation (NWAY 27). Athens, GA. October 2, 1998.
- Labov, William. 1994. *Principles of Linguistic Change: Internal Factors*. Oxford/Cambridge: Blackwell.
- Liljencrants, Johan and Björn Lindblom. 1972. Numerical Simulation of Vowel Quality Systems: the Role of Perceptual Contrast. *Language*. 48:4, 839-62.
- Louden, Mark. 1997. Linguistic Structure and Sociolinguistic Identity in Pennsylvania German Society. *Languages and Lives: essays in honor of Werner Enninger*, ed. by James Dow and Michèle Wolff, 79-91. New York.: Peter Lang.
- Meister Ferré, Barbara. 1994. *Stability and Change in the Pennsylvania German Dialect of an Old Order Amish Community in Lancaster County (Zeitschrift für Dialektologie und Linguistik: Beihefte; H. 82)*. Stuttgart: Franz Steiner.
- Noble, C.A.M. 1983. *Modern German Dialects*. Berne: Peter Lang.
- Parkinson, Frederick. 1996. The Representation of Vowel Height in Phonology. Dissertation. The Ohio State University.
- Penzl, Herbert. 1969. *Geschichtliche deutsche Lautlehre*. München: Max Hueber
- Raith, Joachim. 1992. Dialect Mixing and/or Code Convergence: Pennsylvania German? *Diachronic Studies on the Languages of the Anabaptists*, ed. by Burrige & Enninger, 152-165. Bochum: Brockmeyer.
- Reed, Carroll. 1972. A phonological history of PG. *Studies for Einar Haugen (Janua Linguarum v. 59)*. 469-481. E. Firchow et. al. (eds). The Hague: Mouton.
- Russ, Charles, V.J. 1982. *Studies in Historical German Phonology*. Bern: Peter Lang.
- Russ, Charles, V. J. 1978. *Historical German Phonology and Morphology*. Oxford: Clarendon Press.
- Sapir, Edward. 1921. *Language: An Introduction to the Study of Speech*. San Diego: Harcourt Brace Jovanovich.

- Schlabach, Raymond. 1980. Some Phonological Aspects of the Pennsylvania German of Ohio. M.A. Thesis. The Ohio State University.
- Stine, Eugene S. 1990. *Pennsylvania German to English Dictionary*.
- Thompson, Chad. 1994. The Languages of the Amish of Allen County, Indiana: Multilingualism and Convergence. *Anthropological Linguistics* 36:1.
- Trudgill, Peter. 1983. *On Dialect*. Oxford: Basil Blackwell.
- Trudgill, Peter. 1986. *Dialects in Contact*. Oxford: Basil Blackwell.
- Van Ness, Silke. 1990. *Changes in an Obsolescing Language: Pennsylvania German in West Virginia*. Tübingen: Gunter Narr.
- Van Ness, Silke. 1994. Pennsylvania German. *The Germanic Languages*, ed. by Ekkehard König and Johan van der Auwera, 420-38. London: Routledge.
- Vella Laysa: Bivvel Shtoahris Fa Kinnah*. 1997. Vella Dietsch, Millersburg, OH. Sugar creek, OH: Schlabach Printers.