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Of "Moice" and Men: The Evolution of Male-led Sound Change

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Of "Moice" and Men: The Evolution of Male-led Sound Change

Abstract
Some of the most prominent findings regarding the documentation of linguistic change and how social and linguistic factors affect change as it moves through a community have come from the project on Linguistic Change and Variation in Philadelphia (LCV) conducted in the 1970's, and the analysis of these data (Labov 1994, 2001). This dissertation is a re-study of the Philadelphia speech community, focusing on the effects of sex on language change. The male-led change of the centralization of the nucleus of /ay/ before voiceless consonants (ay0) was selected as the focus of this dissertation. In addition to this variable, this dissertation investigates (aw) and (eyC) through a real time study using the methodology adopted by the LCV. A representative set of vowel tokens were measured and normalized for each subject, and these data were used in multiple regression analyses to identify changes in progress and possible social factors affecting the changes. In order to explore gender further, a 3-part Gender Index was created using sex, sexual orientation and childhood/adolescent socialization experiences. All three variables are still involved in change in apparent time, which is supported by real time analyses. The raising of (ay0) no longer shows a significant sex difference or social stratification. (aw) shows a reversal of the direction of the change in F2 as posited by the LCV, and the real time data confirm this analysis. (eyC) shows change in vowel height, rather than change in F2 as identified in the LCV data. Like (ay0), (eyC) does not show sex differentiation. While the Gender Index does not show significant effects predicting vowel production for any of these variables, sexual orientation does: lesbian women are leading the changes of (aw) and (eyC), while gay men show some resistance to these changes. A matched guise test shows that Philadelphians evaluate the linguistic behavior of women and men on different scales with respect to (ay0). This dissertation shows that language change can exist without sex differentiation, and that sexual orientation is a significant social factor in language change.

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OF “MOICE” AND MEN: THE EVOLUTION
OF A MALE-LED SOUND CHANGE

Jeffrey Christopher Conn

A DISSERTATION

in

Linguistics

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

2005

__________________________________
William Labov
Supervisor of Dissertation

__________________________________
Eugene Buckley
Graduate Group Chairperson
DEDICATION

This dissertation is dedicated
to the memory of
my grandma

Mona Elizabeth Conn

who inspired me to have a strong belief in education and teaching,
and the tenacity to achieve my goals.
Like raising a child, it truly takes a village to write a dissertation. I wish to thank the academy, and everyone else in my life. First and foremost, my very significant other and life partner, Craig, whose continual support, love and kick-in-the-butt-encouragement is a vital component in all of my successes. Another wealth of continual and unconditional support came from my family, so I am eternally grateful to Grandpa Conn, Grandma Crane, mom, dad and Julie and Jerry who have supported Dr. Tigger from the beginning. In addition, thank goodness for my friends Kristin, Sam, Karin, Mike, Janene, Paul, Dale, Teresa, Barbara, Susan, Eli and Karen, Paul and Bella for their love and support in all that I do. I would like to also thank the subjects of my dissertation for sharing their lives with me and showing me that there is love in Philly after all. Especially, “Pat” and “Lynn” who are the lesbians who inspired this dissertation, and for “Gwen L.” who passed on during the writing of this dissertation.

I also need to thank my advisor and mentor, William Labov. His enthusiasm for sociolinguistics is certainly contagious and I have learned more from him than I am even aware at this point in my life. I also want to thank Don Ringe, Gillian Sankoff and Sherry Ash for their support during my time at Penn. In addition to faculty, I owe a lot of gratitude to my fellow students Tara Sanchez, Uri Horesh, Suzanne Evans, Sarah Benor and Maciej Baranowski. Your feedback has been monumental for this dissertation and my career and growth as a sociolinguist. I owe a special thank you to Anne Charity, who has been my dissertation partner since the beginning.
Finally, I would like to thank the students and teachers at Portland State University. Growing from undergraduate, to graduate student, and then to colleague has been an exciting adventure and the endless flow of support has encouraged me to no limits. Thank you to Kathy Harris, Kim Brown, Tom Dieterich, Steve Reder and Jan DeCarrico. I also want to thank Janet Cowal for introducing me to linguistics with such enthusiasm that I fell in love with linguistics and never looked back. In addition, I need to thank Anna Fenyvesi for starting me along the path of short-a and vowel measurement. Finally, I owe a lot of my successes to G. Tucker Childs, who inspired me and supported me early on in my career, and who helped give me the courage to apply to Penn in the first place.

I am blessed to have encouragement from so many different sources, which made this dissertation always an attainable goal. Thank you to Miette, Dedo, Alan and Harlee May as well, for that final piece of unconditional love that makes writing a dissertation feasible. I am very grateful for everyone in my life.
Some of the most prominent findings regarding the documentation of linguistic change and how social and linguistic factors affect change as it moves through a community have come from the project on Linguistic Change and Variation in Philadelphia (LCV) conducted in the 1970’s, and the analysis of these data (Labov 1994, 2001). This dissertation is a re-study of the Philadelphia speech community, focusing on the effects of sex on language change. The male-led change of the centralization of the nucleus of /ay/ before voiceless consonants (ay0) was selected as the focus of this dissertation. In addition to this variable, this dissertation investigates (aw) and (eyC) through a real time study using the methodology adopted by the LCV. A representative set of vowel tokens were measured and normalized for each subject, and these data were used in multiple regression analyses to identify changes in progress and possible social factors affecting the changes. In order to explore gender further, a 3-part Gender Index was created using sex, sexual orientation and childhood/adolescent socialization experiences. All three variables are still involved in change in apparent time, which is supported by real time analyses. The raising of (ay0) no longer shows a significant sex difference or social stratification. (aw) shows a reversal of the direction of the change in F2 as posited by the LCV, and the real time data confirm this analysis. (eyC) shows change in vowel height, rather than change in F2 as identified in the LCV data. Like (ay0), (eyC) does not show...
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CHAPTER 1
INTRODUCTION

1.0 BACKGROUND

The aim of this dissertation is to explore the evolution of language change. Although it was first assumed that language change could not be observed (see Hockett, 1958, and Bloomfield, 1933), recent studies do in fact show support for the contrary position, that change can be traced as it occurs. Using real and apparent time observations, sociolinguists can untangle stable sociolinguistic variables from changes in progress. An apparent time analysis, introduced in Labov’s study of New York City (1966), follows the line of reasoning that by observing the language of people within one community at different age groups, we can observe the progression of language change in that community. As Sankoff (to appear) states in her review article of longitudinal studies in sociolinguistics, a trend study is the clearest way to disambiguate a change in progress analysis from age grading in a community at a given point in time. Some studies have been able to use old records, usually from dialectology research, but these previous reports are not from within the current tradition of quantitative sociolinguistic methodology, and the comparability of these previous studies with current ones is highly suspect, as both Bailey (2002) and Labov (1994) point out.

While age is one of the most crucial social factors affecting variation, it is not the only one. As Labov’s (1963) study of Martha Vineyard demonstrates, the picture of linguistic change and variation in a community is complicated by other social factors. While the factor that affected the linguistic variation in question in Martha’s Vineyard...
was the attitude a speaker had toward the local community, the three recurring social factors involved in most sociolinguistic studies are age, sex, and social class. Age as a factor has already been discussed above regarding apparent time analyses. Sex has been shown in many studies (cf. Labov, 1990, Eckert, 1989, Wolfram & Schilling-Estes, 1998) to play a significant role, where the most frequent situation is that women are leading most changes. In fact, as Coates (1986) shows in her reanalysis of sociolinguistic studies, the effect of sex on linguistic variation and change may be more salient than social class. However, sex as a discrete binary variable may be misaligned with socially constructed gender, and the interaction between sex and a gendered identity needs further investigation. The third most supported social factor on linguistic change and variation is social class. Ash (2002) discusses the many attempts that have been made at uncovering social stratification in a given society, and demonstrates that a combined socio-economic index (SEI) is one of the better options for classifying speakers within a social hierarchy. However, any SEI needs to be developed with the demographics and social make-up of the community in question, and representative of the time the study is conducted. Finally, as Labov (2001) shows, the interaction between these three social variables, in addition to other social variables such as ethnicity and social mobility, is a complicated situation that researchers need to continue to investigate in order to gain a better understanding the evolution of language change.

The most fundamental element of observing language change in progress is the support of an apparent time analysis with real time data, which can be done through real time observations of communities where apparent time analyses were previously given. The use of real time evidence, however, also has its limitations. As both Labov (1994)
and Bailey (2002) illustrate, one of the major problems with observing sound change in progress in real time is that it is difficult to find previous studies that were comparable in methodology and quantitative measures to those used today. Although this statement was true for research conducted in the 1970s and 1980s, it is no longer accurate for current studies. It is possible now to re-examine the research that helped to begin the quantitative tradition in sociolinguistics, and test the accuracy of the various hypotheses about language change that were proposed from this research.

1.1 DESCRIPTION OF THE PROBLEM

As stated above, the current literature surrounding language variation and change has traditionally focused on an apparent time analysis of a given speech community and examining the social factors of age, sex and social class. The goal of this dissertation is to examine and question the role these social factors have on language change situations, focusing on the role that sex/gender plays. The study of Linguistic Change and Variation in Philadelphia [LCV] conducted in the 1970s by Labov and his associates supports the various hypotheses in the field regarding the effects of these social factors on language change. These hypotheses emerge from an apparent time analysis of the 1970s data, as well as real time observations in the form of a few historical, qualitative accounts of the dialect. Therefore, in order to gain better insight into these variables and the mechanism of sound change, a re-study of the Philadelphia speech community using the same methodology adopted and developed by the LCV would provide a more comparable real-time analysis of some of the most paramount data in the field. As this dissertation is replicating the LCV, most of the analyses and methodology used for this dissertation
project have been influenced by and adapted from the LCV project, as well as from the analysis of these data as presented in Labov, 2001 and 1994. Furthermore, this dissertation uses the quantitative tools and the speech community construct adopted by the LCV.

1.2 The Variables Selected for Investigation

The variables examined in this dissertation were selected because they were identified in the LCV analysis (Labov, 2001) as new and vigorous changes. The focus of this project is on two vocalic changes. The primary variable of investigation is the raising of the nucleus of /ay/ before voiceless consonants (ay0), and the secondary variable is the fronting and raising of the nucleus of /aw/ (aw). These variables were chosen for different reasons. (aw) was chosen as an example of a “typical” variable; that is, the more extreme variants are produced by upper-working and lower-middle class women. This change in progress supports the finding that women and the interior social classes lead linguistic change from below. The primary variable of this project, (ay0), was chosen because of its atypical patterning: it shows no real social correlates and men are leading the change. Therefore, in order to investigate the role of sex as a significant social variable, the following chapters present the discussion regarding these focus linguistic variables, as well as other variables involved in change in progress in the current data (e.g., (eyC)).
1.3 Organization of the Present Work

The chapters of this dissertation are organized as follows. Chapter 2 will discuss the related issues in the literature regarding language change in progress and social factors affecting a person’s position in the language change spectrum. Chapter 3 will outline the methodology of the present study. Chapters 4 will outline the analyses, results and discussions of the variable (ay0), while Chapter 5 will present the analyses, results and discussion of the other new and vigorous changes (aw) and (eyC). Chapter 6 will discuss the results of the analysis of the subjective dimension of the focus variables. Finally, Chapter 7 will present the summary and conclusions for this study.
2.0  **INTRODUCTION**

Before I discuss the current dissertation project, I will review the literature and discuss the different accounts proposed to explain the various issues regarding linguistic change and how a change evolves through a community. The first section of this chapter will discuss general issues involved in the investigation of language change, including the methodological tools developed to study language change, and the relevant historical developments of the focus variables of this dissertation. The second section examines the literature surrounding the three most accounted for social variables in modern sociolinguistics: age, social class and gender. Finally, the last section addresses other topics not addressed in the other two sections as it pertains to the Philadelphia data specifically.

2.1  **GENERAL ISSUES REGARDING LANGUAGE CHANGE**

Despite the hypothesis posited that language change can only be examined after the fact, the latter half of the twentieth century has shown quite the contrary. Many different language varieties have been investigated, and a typology of North American dialects of English has been developed using the tools established for examining language change (Labov, Ash and Boberg, 2004). While some dialects are characterized in terms of a single or combination of individual linguistic features (i.e., the low-back
merger), others are described in terms of participation in various sound chain shifts (i.e., the Northern Cities Shift). It is through this evolutionary process of language that creates distinctions between dialects, and these distinctions become more or less pronounced over time to develop into different varieties.

Accompanying the on-going investigation of dialect differences based on language change, certain methodological instruments and constructs have emerged in the field. One of these is a quantitative analytic approach to explain language variation and change, exemplified in the early studies by Labov in Martha’s Vineyard (1963) and New York City (1966). Quantitative analysis converts linguistic variants into numerical form, often into a scale representing the envelope of variation. This approach to variation allows for a more reliable and replicable description of linguistic variation, as well as the ability to discuss zero variants (the absence vs. the presence of a particular variant). The most current quantitative approach includes statistical analyses of social variables transformed into quantitative variables as well as data from computer programs in the form of precise acoustic measurements of linguistic information (e.g., vowel formant measurements). This quantitative tradition has been adopted by many sociolinguists, and is further elaborated on in Labov, Yaeger & Steiner [LYS] (1972), and more recently in Labov (1994) and Labov (2001). In addition to the quantification of linguistic and social information and applying statistical analyses, this tradition has also adopted other constructs as part of the methodology. One of these is the concept of the speech community. This concept as a methodological construct has received criticism (see Patrick, 2001) and alternative approaches have been suggested (see Eckert & McConnel-Ginet, 1992). However, it still remains as an entity for investigation and has not been
completely replaced by other models of social organization. Another construct adopted in quantitative sociolinguistic investigations is the use of the sociolinguistic interview as a data elicitation technique (see Labov, 1972). This instrument was developed to elicit various contextual styles, with the primary purpose of investigating the vernacular. Included in the sociolinguistic interview is the application of various formal tasks applied to elicit more formal styles of speech, at least in terms of style defined as attention paid to speech. Also included in the sociolinguistic interview is a style shift away from a more formal style and toward the vernacular by a number of different methods, and particularly through the elicitation of personal narratives. Through the telling of personal life events, interviewees get caught up in the moment and are less influenced by the relatively formal setting of the interview process, thus resolving the observer’s paradox of observing language as it exists when it is not being observed. In summary, while the traditional quantitative sociolinguistic methodology has been modified in many cases, the core elements that were discussed above include quantitative analyses, adoption of the speech community as an organizational construct, and the use of sociolinguistic interviews as methods of data collection.

One of the major sociolinguistic studies of the latter half of the twentieth century to adopt and apply these techniques described above was the study of Language Change and Variation in Philadelphia [LCV]. This study was designed to investigate the dialect of the Philadelphia speech community. The LCV’s objective was to gain insight into the principles of linguistic change by examining the internal linguistic factors as well as the social factors. Its major purpose was to locate the leaders of linguistic change, as a way of testing the curvilinear hypothesis. The details of the methodology and analysis used in
the LCV will be discussed in subsequent chapters, and a summary of some of the findings from the LCV will be presented in the following sections of this chapter.

Developed from LYS, the LCV examined various historical word classes as the unit of organization to discuss change. This allows for the ability to discuss changes in a common system for different English varieties. For example, while one variety may show a merger in two historically distinct word classes, another variety may maintain the distinction. At the phonemic level, a variety with a merger in place only represents one phoneme in its system, and the ability to compare the two historically different word classes to other varieties that maintain a distinction is lost. The variety with the merger can only be described in terms of its phonemic inventory, which is different from a variety with a distinction. The information regarding the merger of two word classes is no longer relevant in a strictly phonemic analysis of different varieties. In Philadelphia, the LCV identified a variety of word classes implicated in language change. Two of the most prominent changes involved the variables (aw) and (ay0), which are the focus vowels of this dissertation. The reasoning behind the selection of these variables and the social factors effecting variation in the LCV data will be discussed in more detail below. These variables are from two distinct historical word classes, and represent the continued progression from Middle English ĩ and ū after the Great Vowel Shift. As discussed in Labov (1994), /aw/ is fronting and raising along the front peripheral track, while /ay/ (outside the American South) is backing and raising along the back peripheral track (a Pattern 4 chain shift). This evolution is shown below in Figure 1.1.
The word class /ay/ from Middle English ĭ and ŭ has evolved in diverse ways in different dialects of English. Additionally, the backing (and raising/rounding) of /ay/ receives certain social stigmatized evaluations in many dialects, like Outer Banks English (Wolfram & Schilling-Estes, 1996), British English (Labov, 1994) and New Zealand English (Maclagan et al., 1999). Furthermore, the phonetic allophone of a centralized [Aj] before voiceless consonants is reported in many varieties of English, including Canadian English (Thomas, 1991), on Martha’s Vineyard (Labov, 1963), the Inland North of America (Eckert, 1996), as well as part of a general component of northern American speech (Payne, 1980, Labov, 2001). As reported in these studies, the possible realizations of this diphthong involve the following processes: backing, rounding, centralization and the shortening in length of the nucleus (usually involved with the centralization process).

In conclusion, the historical developments of English continue to be documented, leading to greater understanding of the evolutionary process of language. The tools used in the documentation of language change have been introduced above. However, these
tools, methodologies and analyses have been used to move beyond mere documentation and on to the explanation of how and why language evolves.

2.2 THE EVOLUTION OF LANGUAGE CHANGE

The above section offers a brief background of the documentation of language change and the tools developed in that line of research. This section will present studies involved in the examination of the various social factors identified as major components in explanatory theories regarding the evolution of language change. Along with age, the other two main social factors influencing a person’s participation in linguistic change is his/her social class and gender. While many studies have shown both of these factors as key players in language change, I will mainly discuss these variables in relation with the study of Linguistic Change and Variation in Philadelphia (LCV) conducted in the 1970’s and Labov’s 2001 account of the data as it is the most pertinent to this dissertation.

2.2.1 SOCIAL FACTORS OF LANGUAGE CHANGE: AGE

Due to the nature of change through time, the age of a given person is therefore the primary social factor affecting that speaker’s production of variables involved in change. While an age range of speakers included in a given study can be used in an apparent time analysis to support a language change situation, real time studies provide the most accurate evidence of linguistic change in progress. Many investigations rely on an apparent time analysis with some real time observations, but change in real time is best documented in comparable re-studies.
2.2.1.1 LANGUAGE CHANGE IN REAL TIME

As previously discussed, Sankoff (to appear) states that a trend study is the clearest way to disambiguate a change in progress analysis from age grading in a community at a given point in time. Some studies have been able to use old records, usually from dialectology research, but these previous reports are not from within the current tradition of quantitative sociolinguistic methodology, and the comparability of these previous studies with current ones is highly suspect, as both Bailey (2002) and Labov (1994) point out. While the majority of real time support for changes in progress comes from these old records, a handful of trend studies where both the original and the re-study are grounded in contemporary sociolinguistic methodology have been carried out. Sankoff identifies 8 studies that fit this comparability qualification, but only two of the most relevant will be discussed below.

The first is Trudgill’s 1983 follow-up investigation of his original 1968 study in Norwich, England (Trudgill, 1992). In the original 1968 study, 60 speakers were interviewed, ranging in age from 10-93. In 1983, Trudgill interviewed 17 additional speakers, aged 10-25. While there is only one age group which is represented in both studies (10-25 year olds), the 1983 re-study does confirm many of the apparent time findings for nearly all of the variables implicated in change in the 1968 study. In addition to these confirmations, a few more variables surfaced in the 1983 investigation as changes in progress that were not identified as such by the 1968 data. Finally, two variables involved in change in progress in 1968 also showed considerable stylistic effects (glottal stop usage for /t/ and the backing of /e/ before /l/). In 1983, these variables reached a plateau in the direction of the change in informal speech, but the more
formal styles continued to increase in their usage of the variables in the direction of the change. That is, while the apparent time analysis predicted a continual change, these variables represent the end result of change in which the more formal styles catch up with the informal ones. As Trudgill points out, this may be due to a shift in stigmatization of glottal stop replacement of /t/, or the complete merger of /ɛ/ with /ʌ/ before /l/. Trudgill’s trend study certainly demonstrates real time support for his original apparent time analysis, but as he illustrates, the complexities of certain phenomena are only accurately represented by a study of linguistic change in real time.

The other trend study that uses quantitative analysis is Hansen’s investigation of change in French nasal vowels (2001). As Hansen notes, the reason behind the study was to support one of the 2 competing assertions regarding French nasal vowels. Her data support a chain shift change in progress analysis. She does this not by an apparent time analysis, but by comparing 2 age groups from a 1972-74 corpus of recorded speech (recorded by another investigator) with 2 age groups from a 1989-93 corpus of recorded speech (recorded by herself). Although she does not detail the methodology involved in either study, she does state that both were informal face-to-face interviews. From these two sets of data, Hansen is able to carry out both apparent time and real time analyses, although she is not able to compare any 1989-93 age group to its corresponding age group in 1972-74. Despite this limitation, through the real time data, she is able to support a lexical diffusion analysis. Although the main focus of the investigation is the extent a lexical diffusionist approach can explain the change in progress, she is also able to use real time evidence to support that there is a chain shift change in progress involving modern French nasalized vowels.
While both of these studies show that apparent time analyses are viable, they also show that real time investigations are critical to investigate all of the phenomena of language variation and change in a given community. However, neither of these studies is able to say anything about another component of language change: the stability of a given generation of speakers across their lifetimes. A panel study is perhaps the clearest way of following an individual’s dialect, but a trend study can show if a generation of speakers remains constant in the use of a particular variable at 2 different points in time. For example, if a study shows a monotonic relationship of a linguistic variable (say fronting of the nucleus of /aw/) with age at one point in time (say 1972), this can either be interpreted as a change in progress or an age-grading phenomenon. Then, if a trend study conducted at least a generation later (say 2002) shows the same distribution, this represents an age-grading situation. Not only will the follow-up study show the same distribution of age as the original study, but it will also show that 20 year old speakers in 1972 produced /æw/, while in 2002, the corresponding 50 year olds (not the same exact persons but the same generation) changed their production to /aw/. This is clearly an age-grading phenomenon. However, if the situation is truly a change in progress, then the 2002 and the 1972 data should both show that the speakers born in 1952 produce /aw/, regardless of when the study was conducted, with a more fronted variant produced by younger speakers. This represents generational change where the generation is stable and the community is not. The generational stability of language will be supported only through a real time study devised to include comparable age groups. Addressing this issue is one of the components of this dissertation.
2.2.2 Social Factors of Language Change: Social Class

In addition to age, a person’s relative position in the language change continuum of the speech community to which he/she belongs has also been shown to be affected by his/her socioeconomic status. Social class is usually attributed through a matrix of components, contributing to a socioeconomic index (SEI) score for any given individual nested within a community. As Labov (2001) states, testing the idea that linguistic change begins with the non-peripheral social classes (the curvilinear hypothesis) was one of the driving forces behind the LCV. In fact, the LCV data, as well as other studies cited by Labov, do support this hypothesis, which he restates as:

*Principle 1, the Curvilinear Principle: Linguistic change from below originates in a central social group, located in the interior of the socioeconomic hierarchy* (188).

This curvilinear distribution of class, best exemplified by (aw) in the Philadelphia data, however, only represents one situation: new change from below. Changes identified in the Philadelphia data as mid-range or nearly completed show a monotonic relationship between class and linguistic variants, similar to stable sociolinguistic variables. Change from above involves another distribution of social class, described in Labov (1972). This type of change involves a production of the second highest social class that surpasses the highest social class only in the most formal or monitored styles of speech, represented by the “hypercorrect” use of (r) in New York City by the lower middle class. These different distributions of social class and a particular change in
progress, in addition to information regarding intra-speaker variation, help to classify a change from either above or below.

2.2.3 GENDER/SEX

The other major social factor affecting the distribution and evolution of linguistic change and variation is gender. Unlike social class, however, there hasn’t been any adequate proposal for the adoption of a gender index (GI) based on a combination of various local or global socially constructed attitudes and practices regarding male and female behavior, in addition to a speaker’s biological sex. While there is movement in this direction, sociolinguistic studies typically only categorize speakers into men and women, and then use this binary distinction to describe variation. Another critique of the common practices adopted in many sociolinguistic studies is that the use of a binary male/female social variable in multivariate analysis assumes an independence with other variables that simply has not been supported. In an analysis of her Belten High data, Eckert (2000) shows that examining correlations of the various sociolinguistic variables in her study with social variables, there is no one linguistic variable that correlates with one social variable. She suggests, “We clearly cannot talk about gender independently of other aspects of social identity, as no variable correlates simply with gender or social category,” (p. 73). Although she warns that over-simplistic generalizations of gender misrepresent the picture of variation, it has turned up some telling assertions about the difference between men and women’s relationship regarding linguistic variation and change. Labov (2001) characterizes these observations into 3 principles (modified from
his original 1990 account) about the effects of gender (or more accurately, sex) on linguistic variation:

**Principle 2, the Linguistic Conformity of Women:** For stable sociolinguistic variables, women show a lower rate of stigmatized variants and a higher rate of prestige variants than men (266).

**Principle 3:** In linguistic change from above, women adopt prestige forms at a higher rate than men (274).

**Principle 4:** In linguistic change from below, women use higher frequencies of innovative forms than men do (292).

From these principles, Labov identifies a paradoxical situation in which women are both conservative and innovative. This paradox he then summarizes as:

**Conformity Paradox:** Women deviate less than men from linguistic norms when the deviations are overtly proscribed, but more than men when the deviations are not proscribed (367).

This discussion of the gender situation shows a close connection between the sex of the speaker and social awareness and stigmatization of linguistic variables. Through his account of the LCV data, Labov shows that the situation is not as simple as women
use less stigmatized variables than men. By contrasting changes in progress with stable sociolinguistic variables, he shows that not all women behave the same. In fact, the women he identifies as leaders of linguistic change in Philadelphia (adopting innovative, non-proscribed variables) are also the same women who do use more of the stigmatized stable sociolinguistic variables. By resolving the “gender paradox,” Labov illustrates a further problem that not all women behave the same regarding linguistic variation, and by classifying all women into one category, researchers are over-simplifying the actual social situation. That is, there are women who favor both types of non-standard forms. This problematic classification of women as one social group is also mirrored in Coates (1986). According to both Coates (1986) and Trudgill (1984), there is a connection between non-standard speech, masculinity and working class. It may be posited then that leaders of linguistic change, although women, may be masculine women, and the use of either type of non-standard forms is not seen as “feminine.” This situation is further exemplified in Haeri’s (1996) discussion of palatalization in Cairene Arabic. She shows that women do in fact lead this change, but the classification of this as female-led and therefore “feminine” is not an accurate depiction of the women who are leading this change. She illustrates this by the description of the women and men who use the innovative forms. According to Haeri, one of these men is a bouncer at a nightclub, and his physical demeanor is far from “feminine.” Therefore, the connection between the leaders of linguistic change and femininity is questionable.

One account that deals with gender differences in linguistic variation is Gordon and Heath’s (1998) discussion of biological tendencies. According to this account, the high front vowel [i] is associated with diminutiveness and femininity, while the low/mid-
back vowel space is associated with augmentation and masculinity. The various vocalic changes in progress in English and other languages do support this analysis to some extent, but Gordon and Heath do not clearly show how these tendencies map onto a given community and affect language change. One phenomenon that is better explained through Gordon and Heath’s idea is the situation in Canadian raising of /aw/ in Canadian English discussed by Chambers and Hardwick (1986). They show that boys in Vancouver, B.C. occasionally produced mid back rounded variants [o] of the nucleus /aw/ in raising environments, whereas the women in both Toronto and Vancouver were involved in a change in progress involving the non-centralizing but fronting of this same nucleus. However, while these sex-based tendencies do explain some changes in progress, they conflict with the possibility that a vowel change could be led by women in one community, but by men in another. This is the case with centralization and backing of the nucleus of /ay/ before voiceless consonants (hereafter (ay0)). In the Detroit area, this change is being led by women (Eckert, 2000), while this same change is a male-led change in the Philadelphia region (Labov, 2001). Therefore, the universality of this iconic system developed by Gordon and Heath is not supported by different varieties of North American English.

2.2.3.1 Sex, prestige and standard language

As the above discussion indicates, the connection between gender and social awareness and evaluation of linguistic variables is very much connected. As Dubois and Horvath (1999) show in their study of Cajun English, these generalizations about gender and language change do not apply so clearly when there is a shift in prestige of certain
variables or attitudes toward certain varieties (e.g., Cajun English) from within the community. They emphasize the need to examine the local meanings attached to language variation in that community. This is also mirrored in Eckert’s ethnographic work with high school adolescents (Eckert, 2000), and Eckert and McConnell-Ginet’s (1992) concept of Community of Practice (CofP) in language research. These studies adopt a social construction point of view of language and suggest that language use is reflective of constructing identity, and that identity is a dynamic force behind the expressive use of language.

In addition for the need to examine local communities, Eckert’s (2000) study of Detroit adolescents shows that newer linguistic change is first connected to local social group associations (jocks vs. burnouts in the high school setting) with little gender differentiation. As the change progress, gender differentiation becomes more pronounced, but the relationship between social category and gender becomes less clear. An analysis with only apparent time observations does not clearly show how or when a switch of gender differentiation takes place, and if it is the same for all variables.

In fact, linguistic variables do not all behave in the same way, and the social evaluation of a linguistic variable can change in a community as well. As Labov (1972) shows in his account of (r) in New York City, the social evaluation of a change may be proportionate to the age of the change. On the other hand, in Labov (2001), he shows that the subjects under the age of 19 rated one of the LCV speakers considerably higher than the older subjects (p. 214). He then interprets this singularity not to a change in attitude of the speech community towards specific linguistic variables, but as support for his earlier finding that sociolinguistic norms of a community are not fully developed until
adulthood (Labov, 1964). One way that the change in evaluation of a sociolinguistic variable can be observed is illustrated in Maclagan et al. (1999). They show that there is a situation in New Zealand English involving the stigmatized diphthongs /ai/ and /au/. The patterning of speakers with respect to the change in production of these variables indicates that what is considered extreme or stigmatized variants of these variables is changing over time. This leads to a first impression that the younger women are producing more stigmatized forms and that the stigmatization is declining. However, as Maclagan et al. illustrate, by comparing each speaker’s production of these stigmatized variables with production of non-stigmatized changes of the front vowels, they show that professional women still avoid the most extreme variants of the stigmatized variables, while at the same time being on the forefront of the non-stigmatized changes. This shows a shift in acceptable variables across generations, and a re-evaluation of which variants are extreme. This study indicates that not only do sociolinguistic variables and the phonetic range of possible variants change over time, but also so do the evaluations of those variables and ranges.

Another southern hemisphere study conducted on Australian working class youth in Sydney (Eiskovits, 1998) shows the difference between overt and covert prestige. While the young women in the study adopted less stigmatized forms and accommodated to the female interviewer, the young men did the opposite. As Eiskovits suggests, there is an attachment for the boys of masculinity and toughness with adopting and using these stigmatized forms to a greater extent as a way of flouting authority. Although Eckert (1998) suggests that it is women who can be seen to use symbolic resources such as linguistic variation in order to establish status and membership more than men do, the
Australian data from Eiskovits suggests that men too utilize symbolic resources, but for covert status and membership in a different way than women. Turning back to Labov’s (2001) resolution of the gender paradox and his depiction of leaders of linguistic change, he states that one common trait that some of the female leaders of change from below have is their independence and anti-authoritative attitude. As James (1996) states in her review of the literature surrounding gender and prestige language, “. . . males tend to associate non-standard speech with flouting authority and expressing independence,” (p. 115). These studies all indicate that if there is some masculinity attached to flouting these linguistic standards, then women who do this and adopt nonconformist attitudes may be considered “masculine” women. It is this difference along a masculine/feminine continuum that this dissertation will address.

2.2.3.2 SEX VERSUS GENDER IN SOCIOLINGUISTIC RESEARCH

The above discussion presents some issues surrounding gender in the literature. More recently, researchers involved in the language and gender field have questioned the synonymous alignment of gender and sex. As Eckert and McConnell-Ginet (2003) strongly caution, the social construction of gender cannot be captured in a binary coding system of male and female subjects. They draw a distinction between anatomical sex and gender. This distinction is becoming a common one in the language and gender literature, borrowing concepts from gender studies. These concepts involve a constructionist point of view of gender, as something a person does (West & Zimmerman, 1987), as well as part of a performed identity (Butler, 1990). While studies are adopting these concepts of identity and examining identity constructed through
linguistic resources (see Eckert, 2000), they turn to intra-speaker variation in order to
demonstrate this ever-changing construction or performance of identity, gendered or
otherwise. One study of the Philadelphia data which does examine stylistic variation for
one speaker is Hindle’s (1979) dissertation. Hindle demonstrates that for his one female
middle aged speaker, there are differences in production of sociolinguistic variables
involved in language change in the Philadelphia speech community. He examines the
differences in production for her in three different settings: at home with her family, at a
bridge game with her female friends, and at her work environment as a travel agent. The
data show a shift in the direction of the change for her all-female setting if the change is a
female led change. With respect to the male-led change (ay0), she shows a shift in the
direction of the change at her work environment, but a shift in the opposite direction in
her all female friend context. Hindle suggests that the low form of this variable (in the
opposite direction of the change) represents a symbolic connection to “female,” (p. 172).
The shift in the direction of the male led change in the business setting indicates a shift
away from “female.” Therefore, it can be shown how Carol Meyers’ socially constructed
gender is affected in terms of production of variables involved in change and the setting
involved. Only studies investigating intra-speaker variation can support various
hypotheses regarding the linguistic outcomes of performed identities, such as gender in
this framework. Although the language and gender literature continues to indicate that
the traditional sociolinguistic framework is misaligning sex and gender, there is not a big
movement to adapt the framework in order to move beyond using sex as a substitute for
gender. This dissertation project moves in that direction by constructing a gender index,
and follows the terminology distinction in the literature in which sex refers to a person’s biological sex, whereas gender refers to some other socially constructed identity.

2.2.3.3 Sexual Orientation as a Social Factor

Accompanying the literature in language and gender studies is a recent upsurge of work investigating language and sexuality issues. Similar to the language and gender literature, the language and sexuality literature is a diverse group of investigations into various aspects of sexuality. Examining discourse strategies used by heterosexual men, both Kiesling (1998) and Cameron (1998) show how male heterosexuality is constructed and continuously maintained through gossip in all male interactions. Both Gaudio (1994) and Moonwomon-Baird (1997) examine listener’s ability to identify the sexual orientation of male and female speakers. Regarding the men, Gaudio shows that listeners can accurately identify a man’s sexual orientation almost 100% of the time, but he is not successful in showing conclusive evidence that these cues are taken from pitch fluctuations. Regarding women, however, Moonwomon-Baird shows a smaller degree of accuracy (“about half”) for identification of sexual orientation. These studies do not show conclusive support for intonation as a vehicle for carrying information regarding sexual orientation. In fact, Jacobs’ (1996) evaluates these two studies and concludes, “These two studies provide some tentative evidence that some lesbians and gay men in some circumstances do in fact ‘sound’ gay,” (pp. 52-53). This hedged conclusion is not uncommon for much of the literature and its search for identifying linguistic cues of sexual orientation (see Kulick, 2000 for a comprehensive review of the literature). However, there is a gap in the literature connecting the framework of the quantitative
sociolinguistic tradition described above and investigations of sexual orientation. Studies investigating sexual orientation as a social factor within this framework are lacking. Furthermore, investigations that examine the position of gays and lesbians with respect to language change as part of a speech community are non-existent. This is one of the gaps in the literature that this dissertation aims to fill.

2.2.3.4 Growing up gay and other acquisitional issues

In an effort to move beyond sex and include sexual orientation within the traditional quantitative sociolinguistic framework, this dissertation has developed a scale to measure various gender-related factors in the form of a gender index (GI). While the construction of this index is discussed in more detail in Chapter 3, the theoretical background for its inception will be presented here. The first step in moving beyond sex as a social factor was to include self-identified gays and lesbians. The reason for this was in part due to the lack of data on gays and lesbians’ position in language change within a community, but also to gain a different point of view on the masculinity/femininity scale. That is, the gay and lesbian community does not rely solely on a simple relationship of masculinity with men and femininity with women, but uses other measures along a butch-femme continuum. While relying on stereotypes about the gay and lesbian community, this is the first place to begin to examine more masculine women and more feminine men.

It was not surprising that the range of masculinity and femininity among the heterosexual subjects varied widely as well. Since one of the goals of this dissertation was to try to develop some measure to apply to subjects to gain insight into gender
beyond sex, would it be possible to do this without examining intra-speaker variation and adopting a performance view of gender? A first attempt was made trying to classify subjects as more or less feminine/masculine, but an objective measure seemed improbable. Therefore, to create an objective measure, the GI needs to move beyond sex and sexual orientation to capture possible differences of behavior along a masculinity/femininity dimension in the population in addition to these two factors. In addition to sex/sexual orientation, the other measure of the GI emerged from the data in stories about growing up gay and lesbian. While not all gays and lesbians share the same experiences growing up, it was childhood and adolescent experiences that seemed the most likely place to gain insight into differences of masculinity and femininity in adulthood. Again, masculinity and femininity are not objective or static measures of a person’s character, but the socialization experience an adult person had in childhood and adolescence is.

The question from this point is how much effect childhood and adolescent experiences have on a person’s dialect. As shown in Eckert’s (2000) study of a Detroit suburb high school, the use of sociolinguistic variables is highly affected not only by sex, but also by social membership of the adolescent subjects studied. From this investigation, it is clear that who the subjects were involved with socially did play a big part in their linguistic behavior. Furthermore, the adolescents who were considered “in-betweens” and not part of one or other of the major social groups (jocks or burnouts) showed varied linguistic behavior depending on the activity involved. If the activity was a burnout activity, then their use of linguistic variables reflected that association. These data illustrate the importance of socialization at the adolescent level. However, it is not
clear if the anatomical sex of the individuals in any group affected a person’s use of these variables. In other words, if the socialization of the adolescents is paramount to their linguistic behavior, then wouldn’t the sex of the members of the group an adolescent is involved in also be a key factor in predicting linguistic behavior?

Regarding the childhood component, a number of studies indicate that childhood is a time when children begin to reposition themselves away from their parents’ influence. This makes the social group they belong to important in terms of dialect development and acquisition. The Philadelphia data (Labov, 2001) show that adolescents produce more extreme variants than children younger than them. This indicates the importance of both childhood and adolescence as stages of dialect development. Other studies of the Philadelphia speech community confirm that the acquisition of dialect begins at very young ages. Roberts and Labov (1995) show that children begin dialect acquisition at even the preschool level. Payne (1980) examined out of state children and their ability to acquire the Philadelphia dialect. She shows that while some variables are more difficult than others, children eventually reject their parents’ linguistic behavior and accommodate to the new speech community in which they belong. These investigations demonstrate that children’s acquisition of dialect very much depends not on their parents, but their peers. Furthermore, Kerswill and Williams (2000) illustrate a similar situation in the new city of Milton Keynes in England. The children in this situation move away from their parents’ linguistic behavior toward a new norm in which they are a part of creating. This new linguistic behavior is strongest in adolescence but begins in childhood. Theoretically, as discussed in Eckert and McConnell-Ginet (2003), a person learns his or her gender from the moment he or she is born. While they were talking
about gender acquisition and subsequent performance in a dynamic sense, what is critical is that both gender and linguistic acquisition are involved in the socialization of a person, and development of both of these begins in childhood and escalates in adolescence. Therefore, if we examine the outcome of dialect acquisition (assuming a critical age hypothesis), then we are also examining some outcome of gender acquisition based on childhood and adolescence socialization experiences. This outcome is still too subjective to measure, but the experiences a person had can be transformed into an objective scale in terms of the sex of the members of the groups involved in the socialization process.

2.2.3.5 Gender summary

The above discussion summarizes various proposals to account for gender or sex differences in language variation. Perhaps the best way to test some of these assertions is by examining this aspect of behavior in a community in great detail. While an extensive sampling of a community at one point in time can show support for some of these assertions, a re-study of a thoroughly investigated community can add insight that no snapshot, no matter how detailed, could ever provide. That is the basis for the current dissertation project.

2.3 Other questions: Selection of variables and regional affiliation

The above issues regarding the evolution of language change through a community show that the current data are lacking in certain respects, and that various hypotheses emerging from within the traditional quantitative sociolinguistic methodology require further empirical support. In order to provide this support, this dissertation
project is a re-study of the Philadelphia speech community, with some modifications.
Before discussing the current project in subsequent chapters, this final section of this chapter presents further details of the Philadelphia speech community not addressed above.

The first issue is the motivation behind the selection of the focus linguistic variables of this dissertation. One of the main motivators behind the selection of (ay0) comes from various accounts of this variable with respect to the Philadelphia dialect. Labov (2001, 1994) provide the most detailed analysis of the Philadelphia dialect with respect to internal and social influences. Roberts (1997), Payne (1980) and Hindle (1979), explore other aspects of language change in Philadelphia. Both Roberts and Payne investigate the acquisition of Philadelphian linguistic variables by children; Payne looks at the acquisition of variables by children who were not born in Philadelphia, while Roberts looks at acquisition of the Philadelphia dialect by native Philadelphian children. Hindle (1979) explores the stylistic variation of one Philadelphian woman. All of these studies demonstrate that not all of the variables are treated equally. In fact, the one variable that surfaces in all three of these studies as atypical is (ay0). The peculiar behavior of this variable is also identified in Labov (2001). In fact, this male-led change is often the exception to generalizations about how language change progresses through a community. In many respects, this variable does not conform to the social class and gender patterns that Labov is able to identify from many other variables (i.e., (aw)). That is, it does not show a curvilinear distribution of social class for either men or women in the LCV data, and there is a possibility that this is a change from above. Since a trend study can often shed light on problematic patterns, the focus of this dissertation is the
variable (ay0). The other variable (aw) was selected because of its typical behavior with respect to the various hypotheses developed from these data regarding social class and sex. It serves as a foil for the atypical variable.

Another issue involved in the Philadelphia dialect is in regards to regional affiliation. As discussed above, the backing of /ay/ is connected to the raising of /oy/ in a Pattern 4 chain shift, which also includes the lowering of /ey/ and /iy/. This chain shift is a part of the Southern Shift, identified in southern England as well as in the American South. The raising of /oy/ and lowering of /ey/ (in open syllables only) have both been reported in Philadelphia (Labov, 2001), indicating a southern association. The examination of (ay) and its evolution or behavior in other varieties of English does add valuable information about the variable linguistically, but it does not completely clarify the situation in Philadelphia. (ay0) in the Philadelphia data does stand out as the only male-led change in the new and vigorous group. The other 2 changes identified as new and vigorous are particular to Philadelphia, while /ay/-centralization seems to be a more widespread northern phenomenon. In addition, as the more northern-like retrograde change of (eyC) indicates, Philadelphia’s classification as a southern city linguistically is called into question and its possible shifting alliance from Southern to Northern may also be represented by (ay0). Systemically, the raising of /ay/ in closed voiceless consonants (as opposed to /ay/ in open syllables or closed by voiced consonants) can be seen as part of a chain shift involving the raising of (eyC). That is, if the Pattern 4 shift shows /ay/ backing then /ey/ lowering, then couldn’t the raising of (ay0) affect or be effected by the raising of (eyC)? These two allophones of the word classes both show the same environment (closed by a consonant), exemplified by the minimal pair fight and fate.
Therefore, the relative position of one of these vowels would affect the relative distance of the other, and following Martinet (1952), a movement in one class could cause a movement in the other to preserve the systematic distinction between the two phonemes. While it is not clear which of the new and vigorous changes occurred first, or if they are part of a chain shift, it seems that a transition of the Philadelphia dialect from a southern to a northern one includes both variables. Another variable part of the Northern Cities Shift [NCS] and suggested as an incipient change in the LCV data is (ɔ). Due to other vowel shifts of the NCS, (ɔ) is backing into (oh) position. While the data are not conclusive from the LCV, this possible vowel movement would further indicate a northern connection. Linguistically, in the Philadelphia system, this movement would not be to replace (oh) which has lowered to replace (o) like in the NCS, but due to a gap left by the raising of (oh) in Philadelphia, movement of (ɔ) in the previous (oh) position is a viable option.

2.4 Chapter 2 Summary

The Philadelphia data from the LCV and the analysis of this data (Labov, 2001) have shown substantial evidence for the hypotheses put forward about how change evolves in a community. Furthermore, these data support the use of quantitative sociolinguistic methodology and demonstrate the value of the constructs used in this field. There are still questions regarding the limitations of this framework, and the ability to expand or modify this framework to investigate further issues regarding the evolution of language change. Finally, the Philadelphia data present further questions about
language change which have not completely addressed or resolved. The following chapters of this dissertation present the data and analysis of the current study, which was devised to address these unresolved issues in the literature presented above.
CHAPTER 3

METHODOLOGY

3.0 INTRODUCTION

This chapter will describe the details of the methodology used in this study. Because the current investigation is a re-study of the study of Linguistic Change and Variation in Philadelphia (LCV), one of the goals was to follow the methodology set forth by the previous study as closely as possible. However, there were some adjustments that needed to be made in order to conduct a comparable study 30 years later. These modifications will be discussed below. The current study is referred to by an abbreviation of its title: Of “moice” and men (OMM).

3.1 THE PHILADELPHIA SPEECH COMMUNITY IN THE 2000s

Like most US cities, Philadelphia has seen many changes over the course of the last 30 years of the Twentieth Century. This section will discuss how these changes affected the selection of the neighborhoods used to recruit subjects as well as how city-wide demographic changes required an updated version of the socioeconomic index.

3.1.1 THE NEIGHBORHOODS OF PHILADELPHIA 30 YEARS LATER

After much exploratory work, one of the first steps for the LCV was to identify appropriate sites for the various neighborhood studies that supplied the majority of the data discussed in Labov (2001). These neighborhoods were selected to be representative of the Philadelphia speech community.
One of the first locations selected by the LCV was Kensington, an established working class neighborhood. According to Labov (2001) the census tract information for this neighborhood used by the LCV shows that in 1970, there was no African American population. The census data for 2000, however, shows an extensive increase in African American population in the tract to 25.6% of the total tract population (9,159). The predominantly white population of the 1970s has decreased to 30.7%. Finally, the largest racial group in this tract, not even present in the 1970 census data, is the Hispanic population at 35.3%. The drastic changes of this tract are representative of most of the Kensington neighborhood. The current study, therefore, selected the southern and eastern sections of Kensington as a source of subject recruitment, expanding into the adjacent neighborhoods of Fishtown, Port Richmond and Frankford to locate a more homogenously white population.

The various South Philadelphia neighborhoods selected by the LCV have not changed as drastically as Kensington, so the current study selected South Philadelphia as another neighborhood for subject recruitment.

Another neighborhood selected by the LCV was Overbrook in West Philadelphia. This neighborhood was omitted as a selection for subject recruitment due to the increase in African American population (from 0.1% in 1970 to 58.8% in 2000 for the census tract used by the LCV).

The neighborhood selected by the LCV to represent the upper end of the middle class population was the suburban community of King of Prussia. Unlike the LCV, the current study did not have any secondary requirements for the selection of a
neighborhood, so King of Prussia was exchanged for the northwestern Philadelphian neighborhoods of Mount Airy and Chestnut Hill for subject recruitment.

Finally due to the differences between a large, grant-funded project and a single-investigator dissertation, the current study did not select individual blocks in each neighborhood for long-term investigation, as was done for the LCV. Instead, as will be discussed below, neighborhoods were selected and samples of the population from those neighborhoods were interviewed.

### 3.1.2 The Subjects

Following the LCV, one of the ways subjects were recruited for this study was by locating people on the street, outside of their homes. While this method had limited success in the middle class neighborhoods of Mt. Airy and Chestnut Hill, I was able to interview many willing volunteers in South Philadelphia, Port Richmond and Fishtown. Some interviews occurred in subjects’ houses, while others occurred on the front steps. In addition to off-the-street interviews, I was able to locate other subjects by referral. Some referrals were from people I interviewed, while others were from people who declined to be interviewed, but offered another potential subject as an apology of sorts.

Another goal of the current study is to investigate the possible role sexual orientation may play on a person’s position with respect to language change. Therefore, a small sample of self-identified gay men and lesbian women were recruited through referrals and a friend-of-a-friend network. In addition, some family members of the gay and lesbian subjects are included in the overall sample.
A total of 73 subjects were interviewed. Some were eliminated due to the non-nativity of both parents. The data represented in this dissertation are from the remaining 65 subjects. 9 subjects identified as lesbian, and 5 identified as gay men. Table 3.1 below shows a break down of the subjects by neighborhood they were raised in.

**Table 3.1 Subjects by area of the city**

<table>
<thead>
<tr>
<th>Neighborhood area of Philadelphia</th>
<th>South</th>
<th>West</th>
<th>North</th>
<th>Northwest</th>
<th>Northeast</th>
<th>Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>9</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Women</td>
<td>14</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

In the table above, South includes all South and Southwest Philadelphia neighborhoods, including Pennsport and Whitman, as well as cities outside of Philadelphia, such as Chester. West includes Overbrook, West Philadelphia and Drexel Hill. North includes a variety of neighborhoods in North Philadelphia, such as Logan, Nicetown and Olney. Northwest includes northwest Philadelphia neighborhoods and suburbs, such as Mt. Airy, Chestnut Hill, Roxborough, Plymouth Meeting, Norristown, Jenkintown and Huntingdon Valley. Northeast includes neighborhoods east and north of the city center, such as Fishtown, Port Richmond, Frankford and Oxford Circle. Center is included for the one subject who grew up and resided in Center City.

### 3.1.3 Updating the Socioeconomic Index

The LCV adopted a composite score to establish a speaker’s socioeconomic class. This score was based on 3 indices: education, occupation and residence value. These indices were established based on the situation in Philadelphia in the 1970s, and
the 3 indices were totaled to give an overall socioeconomic index (SEI) score. A reprint of the SEI used by the LCV is shown in Figure 3.1. The current study could not use the same 6-scale index and apply it to Philadelphians in the 2000s without updating it.

<table>
<thead>
<tr>
<th>Education (E)</th>
<th>Occupation (O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 professional</td>
<td>6 professional, owner</td>
</tr>
<tr>
<td>5 college grad</td>
<td>director of large firm</td>
</tr>
<tr>
<td>4 some college</td>
<td>5 white collar – proprietor, manager</td>
</tr>
<tr>
<td>3 high school grad</td>
<td>4 white collar – merchant, foreman, sales</td>
</tr>
<tr>
<td>2 some high school</td>
<td>3 blue collar – skilled</td>
</tr>
<tr>
<td>1 grammar school</td>
<td>2 blue collar – unskilled</td>
</tr>
<tr>
<td></td>
<td>1 unemployed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residence Value (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 $25,000+</td>
</tr>
<tr>
<td>5 $20,000 – $24,900</td>
</tr>
<tr>
<td>4 $15,000 – $19,900</td>
</tr>
<tr>
<td>3 $10,000 – $14,900</td>
</tr>
<tr>
<td>2 $5,000 – $9,900</td>
</tr>
<tr>
<td>1 $0 – $4,900</td>
</tr>
</tbody>
</table>

*Figure 3.1* Socioeconomic index adopted by the LCV

### 3.1.3.1 Residence Value

The most obvious change is the increase in property values reflected in an increase in residence values. According to the US Census data, the median house value in Philadelphia in 1970 was $10,600. In 2000, that number increased to $59,700. Therefore, the 6 scales of the residence index were multiplied by 5.632, the amount of increase in value from 1970 to 2000. Table 3.2 shows the original LCV scale and the new updated scale used by the current study (OMM).
Table 3.2 Residence Value scales from the LCV and OMM

<table>
<thead>
<tr>
<th>Residence Value (R)</th>
<th>LCV Scale</th>
<th>OMM Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$25,000+</td>
<td>6 $140,000+</td>
</tr>
<tr>
<td></td>
<td>$20,000 – $24,900</td>
<td>5 $112,000 – $139,900</td>
</tr>
<tr>
<td></td>
<td>$15,000 – $19,900</td>
<td>4 $83,000 – $111,900</td>
</tr>
<tr>
<td></td>
<td>$10,000 – $14,900</td>
<td>3 $56,000 – $82,900</td>
</tr>
<tr>
<td></td>
<td>$5,000 – $9,900</td>
<td>2 $28,000 – $55,900</td>
</tr>
<tr>
<td></td>
<td>$0 – $4,900</td>
<td>1 $0 – $27,900</td>
</tr>
</tbody>
</table>

One further adjustment was made. The lower value of the range was rounded to the nearest thousand. The lower value for a residence value score of 4 was decreased $1,000 further to $83,000 in order to include some census tract areas of Mt. Airy and to conform to other indications that people living in this neighborhood are middle class. In addition to the modifications discussed above, speakers living in apartments received a residential value 1 level below the census information for the neighborhood they resided in. This was to reflect the difference between owning a house versus renting in a neighborhood, while at the same time preserving the socioeconomic consequences for living in any given neighborhood.

3.1.3.2 OCCUPATION

While the 6 point scale of the occupation index of the SEI could still be used 30 years later, the current study turned to other sources for a more detailed account of attributing an occupation score to any individual. Following the Atlas of North American English (Labov, Ash & Boberg, 2004), the occupational prestige and socioeconomic index scores presented in Nakao and Treas (1994) were used to assign an SEI score to each speaker based on his or her occupation. The occupation categories in Nakao and
Treas are based on census category information. The scores assigned to the subjects of the current study range from 28 to 92. This range was broken down into 6 levels, representing the 6 point scale of the occupation index used in this study, and each speaker was then assigned an occupation score of 1 to 6. Table 3.3 shows the socioeconomic category, the 6 point scale of the occupation index used by the OMM, the corresponding SEI score from Nakao and Treas, and some example jobs that could be found in that range.

Table 3.3 Comparison of socioeconomic information for occupation index

<table>
<thead>
<tr>
<th>Class Category</th>
<th>Occupation Index Score</th>
<th>Nakao &amp; Treas SEI score</th>
<th>Example Occupation Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Working</td>
<td>1</td>
<td>28 to 30</td>
<td>Factory worker, construction worker, nurse’s aide</td>
</tr>
<tr>
<td>Middle Working</td>
<td>2</td>
<td>31 to 35</td>
<td>House painter, flooring installer, cashier, bank teller, truck driver</td>
</tr>
<tr>
<td>Upper Working</td>
<td>3</td>
<td>36 to 41</td>
<td>Receptionist, bookkeeper, secretary, medical assistant</td>
</tr>
<tr>
<td>Lower Middle</td>
<td>4</td>
<td>42 to 53</td>
<td>Computer operator, small business owner, executive secretary, office manager</td>
</tr>
<tr>
<td>Middle Middle</td>
<td>5</td>
<td>54 to 67</td>
<td>Legal asst., police officer, manager of a business, contractor, college student, real estate agent, registered nurse</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>6</td>
<td>68 to 92</td>
<td>Accountant, teacher, lawyer, engineer, architect, pharmacist</td>
</tr>
</tbody>
</table>

3.1.3.3 Education

While the same 6 point scale for education was used in the OMM, there has been an increase in educational attainment in Philadelphia since the 1970s. According to census information from 1970, the median educational attainment level was 10.9. While the same type of measurement was not used for the 2000 census, the median value for
educational attainment falls in the high school graduate or equivalent category. Despite the fact that the measurement for educational attainment differs from one census to the other, what is important for the methodology used in the current study is that the median value has changed 1 point with respect to the education index. That is, since there has been an increase in the number of Philadelphians who are graduating from high school, more speakers in the current study would have a higher education score than their same class counterparts from 30 years ago. Therefore, to account for this increase, the overall SEI score ranges for the social class categories have all been increased by 1.

3.1.3.4 SOCIAL CLASS CATEGORY

Finally, another modification to the socioeconomic classification system adopted by the LCV was the change from 6 social class categories to 4. The upper class of Philadelphia was not selected as a target population for study for the current project. Also, the working class was collapsed into 2 categories to mirror the middle class categories. The resulting class categories for the current study are lower working, upper working, lower middle and upper middle class. Table 3.4 shows the conversion of the LCV class categories to the OMM categories with matching SEI scores. Each subject received a socioeconomic class category (SEC) distinction based on the SEI scores detailed below.
Table 3.4 Class category conversion

<table>
<thead>
<tr>
<th>LCV Class Category</th>
<th>SEI Score</th>
<th>OMM Class Category (SEC)</th>
<th>SEI Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>LWC</td>
<td>2-3</td>
<td>LWC</td>
<td>3-7</td>
</tr>
<tr>
<td>MWC</td>
<td>4-6</td>
<td>UWC</td>
<td>8-10</td>
</tr>
<tr>
<td>UWC</td>
<td>7-9</td>
<td>LMC</td>
<td>11-13</td>
</tr>
<tr>
<td>LMC</td>
<td>10-12</td>
<td>UMC</td>
<td>15-18</td>
</tr>
<tr>
<td>UMC</td>
<td>13-15</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>UC</td>
<td>16</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Besides the elimination of the upper class, the OMM lower working class includes the LCV middle working class. Another difference is that the total range is from 3 to 18, the minimum and maximum score possible based on 3 indices ranging from 1 to 6. In order to distinguish between upper middle class subjects and upper class subjects, special care was taken in the interview to discern if the subject identified as a member of the Philadelphian upper class culture, or if he or she was raised in this atmosphere. One subject was eliminated from analysis due to an upper class upbringing.

3.1.4 Other social information: Sex, sexual orientation and gender

In addition to social class, sex is the other major social factor that has shown to affect sociolinguistic variation. Although sex was not explicitly discussed above, all of the subjects were coded as either male of female based on anatomical sex, or more appropriately, the sex they presented. In this study, there were no ambiguous cases regarding physiological sex. As part of motivation behind exploring the roles of gender as opposed to just sex, each speaker was coded for sexual orientation as well. In most cases, the speakers identified themselves as self-identified gays or lesbians from the sample of gays and lesbians (through a referral system). There was one woman who was
omitted from the study because she refused to discuss the topic although she was referred to me as a lesbian woman. In addition to this, she did not have native Philadelphian parents. The speakers that did not self-identify as gay or lesbian were asked a series of questions designed to elicit narratives about dating, but which also served to verify their self-identified heterosexuality. While there is no absolute proof of a person’s sexual orientation, the identity a person chooses to portray is the only piece which can be coded in a study such as this one. It is possible that this piece is in fact more important than any true or real hidden identity, at least as far as the linguistic repercussions for performing an identity based on sexual orientation. Therefore, the possibility exists that a speaker in this study did not identify as gay or lesbian but was in fact a closeted gay or lesbian. These hypothetical cases, however, are beyond the scope of this investigation, so a person’s sexual orientation was based on the identity that he or she portrayed to the interviewer.

Since one of the goals of this study was to explore the possible effects of gender as a more complex variable than sex alone, a gender index (GI) was constructed. Using the SEI as a prototype, a two-part index was designed. Contrary to the social construction theory of gender, this study developed the GI to quantify a possible static relationship based on sex, sexual orientation and experience of childhood and adolescent socialization. This scale is not in opposition to the concepts of gender as a performed identity, but rather is an attempt to classify speakers in only one situation, a sociolinguistic interview. Therefore, the scale has to adopt aspects of a person’s identity that are relatively static. In addition, the scale was constructed to represent these static characteristics of a person in relation to stereotypical norms regarding masculinity and
While these norms and what it means to fit or not fit within these norms vary from community to community, the GI was not created to investigate differences in stereotypes of masculinity and femininity in a given community. By adding the scores for the two different components of the GI, the scale is set up as a continuum from feminine at the lowest end (a score of 2) to masculine at the highest end (a score of 9). The concept of this type of continuum is questionable, and some have suggested that each person possesses both masculine and feminine traits at the same time (Bem, 1974). The GI, however, represents the stereotypical binary view regarding this issue. The complete GI is shown in Figure 3.2 below.

**Figure 3.2 Gender Index**

<table>
<thead>
<tr>
<th>Sex / Sexual Orientation (S)</th>
<th>Feminine</th>
<th>Masculine</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 heterosexual man</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3 lesbian woman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 gay man</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 heterosexual woman</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Childhood and Adolescence Socialization Experience (E)</th>
<th>Feminine</th>
<th>Masculine</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 One of the boys all the time (all-male group socialization in both childhood and adolescence)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 One of the boys part-time (≈ in CH ~ Boys in Ad OR Boys in CH ~ = in Ad)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Socialized Semi-Neutrally, Equally or Switched groups (had few friends of either sex in both childhood and adolescence OR had equal boy and girl interactions in CH and Ad OR switched from Boys in CH to Girls in Ad or vice versa)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 One of the girls part-time (≈ in CH ~ Girls in Ad OR Girls in CH ~ = in Ad)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 One of the girls all the time (all-female group socialization in both childhood and adolescence)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The first component of the GI is a combination of sex and sexual orientation. These aspects were selected due to their static nature. While it is true that sex and sexual orientation can in fact change, this type of change is not the same dynamic aspect of identity that studies based on a performative theoretical construct of gender focus on. The scale for this component ranges from the feminine end of 1 to the masculine end of 4. This scale was constructed based on stereotypes regarding heterosexual and homosexual persons. The distribution for the first component of the GI by social class is shown in Table 3.5 below.

<table>
<thead>
<tr>
<th></th>
<th>LWC</th>
<th>UWC</th>
<th>LMC</th>
<th>UMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Women</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Gay Men</td>
<td></td>
<td></td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lesbian Women</td>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

The other component of the GI is a quantification of another static trait of a person: his or her childhood and adolescent socialization experience. This component quantifies the experience a person had growing up. As discussed in Chapter 2, this component emerged from the data from the shared common experiences that lesbians reported regarding their childhood and adolescence. That is, some lesbian women in this study told the same story about what it was like to grow up as a tomboy. However, not all lesbians in this study, or in the population for that matter, share this experience. In fact, many self-identified heterosexual women grew up as tomboys as well. This component of the GI then represents a range of experiences that can be shared by members of the same or different sexual orientations. The concept behind this
component is to find a quantifiable measure to account for the range of masculinity and femininity in both gay/lesbian and heterosexual populations. This component is an attempt at distinguishing masculine men and women from feminine men and women, regardless of sexual orientation. Although dialect acquisition is not the focus of this investigation, the data from the LCV (Labov, 2001) indicate that adolescence is a time speakers use the most extreme variants of sociolinguistic variables. Therefore, the social situation a person is in during these times seems like a critical piece of information when discussing the outcomes of dialect acquisition (describing a person’s position with respect to sociolinguistic variables after the age of 18). The scale was constructed to include a 100% single-sex friendship network (scores of 1 or 5) and a completely mixed or neutral friendship network in the middle (score of 3).

Using this overall GI score is similar to using the actual score of the SEI. However, in order to group scores into a more meaningful category, the SEI was broken down into 4 social class categories. In order to provide some meaningful grouping of the GI, a 3 level categorical distinction was established: feminine, masculine and neutral. The complete center of the scale is an impossible score of 5.5, so the neutral category range was constructed around that midpoint. The feminine category includes the scores ranging from 2 to 4. The masculine category includes the scores ranging from 7 to 9. This leaves the scores from 5 to 6 in the neutral category. The highest score possible for a heterosexual woman is 6, while the lowest score possible for a heterosexual man is 5. By including these scores in the neutral category, the three-way distinction was able to capture at least two different categories for every sex/sexual orientation combination.
The GI categories showing the score ranges for each sex/sexual orientation combination are shown in Figure 3.3 below.

While gay men and lesbians could be coded as any category using this system, all of the gay men in the data received a score of 5 or 6, resulting in a “neutral” GI category. Likewise, all of the heterosexual men received scores higher than 6, resulting in a “masculine” label. These data do not represent any men growing up in all female socialization circles. The women, on the other hand, do show some variation of GI categories. Only one heterosexual woman received a score higher than 4, resulting in a “neutral” categorization. While some heterosexual women participate in mixed sex groups growing up, she was the only one who claimed a male-centered social group. Finally, the lesbian women show the widest range of GI category. While most of the lesbians received a “neutral” label, one received a “masculine” label and one received a “feminine” label.
3.1.5 Social information: House Upkeep, Mobility, Generation, Ethnicity

Following the LCV, the speakers in the current study were also evaluated in the following scales: house upkeep, social mobility, generational status and ethnicity.

The first of these, house upkeep, is designed to explore social prestige at a finer level than socioeconomic class. While the census information regarding the residence values of a block or census tract are useful for establishing a residence value for the SEI, it does not evaluate local prestige from one house to another on the same block. House upkeep is a scale designed to accomplish just that. Therefore, speakers were rated on the 5-point following scale shown in Table 3.6.

Table 3.6 House Upkeep scale

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td><strong>Major renovations</strong> to exterior/interior. New modern fixtures in bathroom, newest furniture. New front façade, front door, cornice straightened with new brickwork and tiles, new windows and front steps. Pointed to with satisfaction and approval.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Improved</strong>: internal improvements to kitchen and bathroom, enlarging of rooms, new additions to furniture. External: visible improvements in air conditioning, front steps, windows. When young house owners are making improvements of this kind, it is good evidence that they intend to make the neighborhood their permanent home.</td>
</tr>
<tr>
<td>3</td>
<td><strong>Kept up</strong>: painted and clean. No recent modern decorating improvements or renovation. The house is not pointed to as being in bad shape. Often neighborhood residents give a reason for its less-than-modern appearance, i.e., “Oh, old Mrs. Seriatte lives there – for 52 years,” or “They’re a young couple, just renting.”</td>
</tr>
<tr>
<td>2</td>
<td><strong>Dilapidated</strong>: not up to the “kept up” standards of the block, no evidence of an effort to maintain the house. Window sills need painting, the door is battered, front pavement is littered or dirty. The difference between “kept up” and “dilapidated” often depends on who is in the house, and how the neighborhood perceives the dwellers’ ability to work on the house.</td>
</tr>
<tr>
<td>1</td>
<td><strong>Rundown</strong>: not often found in the five neighborhoods. Again, it depends on how the neighbors perceive the ability of its residents as to whether it is termed “rundown” or “dilapidated.”</td>
</tr>
</tbody>
</table>
In the current study, 21 speakers received a score of 3, and 27 received a score of 4. No speaker received a score of 1, and only 1 received a score of 2. 2 speakers received a score of 5 (they were in the same household), while the rest did not receive a house upkeep score due to the interview occurring outside their home or the speaker lived in an apartment.

Another social variable introduced in the LCV is social mobility. This factor is included to identify if upward or downward social mobility affects linguistic change in progress. Unlike the LCV scoring system, both parents of the speaker were included in the calculation of mobility for OMM. If the speaker received an education and occupation score lower than either parent, the speaker was coded as downwardly mobile (0). If the speaker received an education and occupation score higher than both parents, the speaker was coded as upwardly mobile (2). In all other occasions, the speaker was coded as equal (1). Only 5 speakers were coded as downwardly mobile, while the remaining speakers were split between upwardly mobile (34) and equally mobile (26).

The third social variable established by the LCV is generation status. This social information indicates if the speaker is the first generation born in the United States (the child of immigrants), or if his/her family has been established in American culture for some time. Unlike the LCV, the current study posed the question with respect to Philadelphia. Speakers were asked if parents, grandparents, etc., were born and raised in Philadelphia. A score of 1 indicates a first generation born in Philadelphia (child of immigrants), while a score of 2 indicates that the speaker and his/her parents were born and raised in Philadelphia. A score of 3 is for a third generation Philadelphians, and a score of 4 represents more than 3 generations of Philadelphians in the family. Since non-
Philadelphian born persons were ineligible for the current study, there were no scores of 0 indicating immigrant status. Only 3 speakers received a score of 1, while 14 received a score of 2. The majority of speakers received scores of 3 (25 speakers) or 4 (23 speakers).

Finally, the last social factor adopted in the LCV is ethnicity. The following ethnicities were coded for in the LCV data: Italian, Irish, Jewish, WASP, German, Polish, and miscellaneous European. The current study adopted the same ethnic coding system, and included a special category for subjects who identified as half Irish and half Italian. Furthermore, if subjects identified multiple ethnicities and did not choose any primary ethnicity, they were coded as miscellaneous European. Table 3.7 shows the distribution of ethnicities in the current study’s sample.

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italian</td>
<td>6</td>
</tr>
<tr>
<td>Irish</td>
<td>18</td>
</tr>
<tr>
<td>WASP</td>
<td>1</td>
</tr>
<tr>
<td>Jewish</td>
<td>8</td>
</tr>
<tr>
<td>German</td>
<td>4</td>
</tr>
<tr>
<td>Polish</td>
<td>6</td>
</tr>
<tr>
<td>Misc. European</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
</tr>
</tbody>
</table>

### Table 3.7 Ethnic distribution in the current study

3.2 **The Interviews**

The interviews followed the now-established tradition of the sociolinguistic interview. In addition to basic demographic information, some social information regarding childhood and adolescence and male/female associations were asked as part of the information for the Gender Index. Narratives were elicited when possible, and questions from the LCV regarding a person’s social network ties were also asked. Finally, the interview concluded with a more formal section having to do with language,
including semantic differentials, minimal pairs test, a reading passage and a word list (see Appendices A, B and C for these components).

3.2.1 GAY AND LESBIAN INTERVIEWS

In addition to the typical sociolinguistic interview, the gay and lesbian subjects were asked to do an additional formal task in order to elicit information and speech regarding different types of gay men and lesbians and the terms used to distinguish these types (see Appendix D for the list of these terms).

3.2.2 SUBJECTIVE REACTION TEST (SRT)

Another aspect of the interview process was the administration of the subjective reaction test (SRT). Although the details of this device will be discussed further in Chapter 6, OMM followed the methodology laid out by the LCV regarding the employment of some sort of measure to evaluate speakers’ opinions regarding particular linguistic variables. Although not all speakers participated in the SRT, there are data from 59 subjects. Also, some of the data regarding the SRT come from subjects who were later eliminated from further analysis for reasons discussed above (i.e., non-nativity of both parents, upper class membership). The SRT essentially was composed of 6 speakers, 3 men and 3 women, reading 6 different sentences, for a total of 36 utterances. The subjects of OMM were told of these details and were asked to rate each utterance on 4 scales: job suitability, friendliness, toughness, and masculinity/femininity. This was included as part of the formal tasks in the interview. Further discussion of the results and composition of the SRT are discussed in Chapter 6.
3.3 THE LINGUISTIC DATA

After the interviews were digitized, they were then segmented for stressed tokens of various vowel classes and allophones. Following Labov (2001) and the coding system of the Plotnik program, a total of 25 relevant vowel classes were identified for segmentation. In addition to the major classes, a further 13 classes of allophones before /l/ and 9 classes of allophones before /r/ were included. Although there was a target of 5 tokens per class, many interviews were segmented to include more tokens, resulting in a more complete picture of a speaker’s vowel system. In addition, since the focus of this dissertation is the 2 variables (ay0) and (aw), as many of these tokens were segmented as possible. Fewer tokens of pre-lateral allophones were included, as they were not the primary focus of this study. As some word classes with tautosyllabic /r/ figure prominently in the Philadelphia dialect (i.e., /owr/, /ohr/, /ahr/), they received more focus, and consequently, more tokens were segmented in these sub-classes. The various classes and example words are shown in Table 3.8 below, with important subclasses in bold. These adopt annotations developed by Labov (1994, 2001).

One difference between these classes used for segmenting and the Plotnik results is in the /uw/ class. Originally, and part of the analysis used on the LCV, this word class (like the /ow/ class) was coded for three allophones: /uw/ in free position, in checked position and before /l/. In the newer versions of the Plotnik program (versions 6 and 7), however, the first two allophonic environments have shifted to /Tuw/ and /Kuw/, which indicate /uw/ after coronal onsets versus non-coronal onsets (respectively). Therefore, the analyses are conducted with the latter coding scheme with respect to this word class.
Table 3.8 Vowel classes and allophones

<table>
<thead>
<tr>
<th>Short Vowels</th>
<th>Front Vowels</th>
<th>Back Vowels</th>
<th>Other Vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>Vowel</td>
<td>Example</td>
<td>Vowel</td>
</tr>
<tr>
<td>pit</td>
<td>/i/</td>
<td>see</td>
<td>/iyF/</td>
</tr>
<tr>
<td>pet</td>
<td>/e/</td>
<td>seat</td>
<td>/iyC/</td>
</tr>
<tr>
<td>pat</td>
<td>/æ/</td>
<td>say</td>
<td>/eyF/</td>
</tr>
<tr>
<td>pot</td>
<td>/o/</td>
<td>safe</td>
<td>/eyC/</td>
</tr>
<tr>
<td>putt</td>
<td>/ʌ/</td>
<td>bath</td>
<td>/æhS/</td>
</tr>
<tr>
<td>put</td>
<td>/ʊ/</td>
<td>bad</td>
<td>/æhD/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ban</td>
<td>/æhN/</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-/r/ allophones</th>
<th>Pre-/l/ allophones</th>
</tr>
</thead>
<tbody>
<tr>
<td>here</td>
<td>/iyr/</td>
</tr>
<tr>
<td>there</td>
<td>/iyr/</td>
</tr>
<tr>
<td>fire</td>
<td>/ayr/</td>
</tr>
<tr>
<td>hour</td>
<td>/awr/</td>
</tr>
<tr>
<td>far</td>
<td>/ahr/</td>
</tr>
<tr>
<td>for</td>
<td>/ohr/</td>
</tr>
<tr>
<td>four</td>
<td>/owr/</td>
</tr>
<tr>
<td>feel</td>
<td>/iy/</td>
</tr>
<tr>
<td>fill</td>
<td>/i/</td>
</tr>
<tr>
<td>fail</td>
<td>/eyl/</td>
</tr>
<tr>
<td>fell</td>
<td>/el/</td>
</tr>
<tr>
<td>pal</td>
<td>/æl/</td>
</tr>
<tr>
<td>file</td>
<td>/ayl/</td>
</tr>
<tr>
<td>foul</td>
<td>/awl/</td>
</tr>
<tr>
<td>fool</td>
<td>/uw/</td>
</tr>
<tr>
<td>full</td>
<td>/ul/</td>
</tr>
<tr>
<td>goal</td>
<td>/owl/</td>
</tr>
<tr>
<td>gull</td>
<td>/al/</td>
</tr>
<tr>
<td>hall</td>
<td>/ohl/</td>
</tr>
<tr>
<td>doll</td>
<td>/ol/</td>
</tr>
</tbody>
</table>

Following the LCV and the more contemporary Atlas of North American English, the analysis on these segmented data is vowel formant analysis using information from a linear predictive coding (LPC) and methodology for single point formant measurement. Using the speech analysis program Praat, the first 2 formants were measured (and when possible, F3) for each speaker for about 200-300 tokens to represent his/her entire system. Some speakers systems are comprised of more tokens than others, ranging from about 220 to over 1,000 tokens. The data were then examined for possible measurement mistakes and extreme outliers were evaluated to double check the accuracy of the measurements. These cleaned data were then normalized by Plotnik using Neary’s Log mean normalization as described in Labov (2001), resulting in comparable F1 and F2 measurements across age and sex. Plotnik was then used to calculate the F1 and F2 means for each vowel class shown in Table 3.8 above. The statistical analyses discussed
in subsequent chapters are conducted on these cleaned and normalized mean data using JMP IN Statistics and Graphics software (SAS Institute, Inc.).

3.4 **CHAPTER 3 SUMMARY**

This chapter has discussed the methodology used in the current study investigating the evolution of a previously identified sound change (ay0). Due to the nature of a re-study, differences in methodology between the previous study and the current study were discussed, and any modifications from the original study in the methodology of the current study were explicitly identified. The fieldwork for the current study took place in various neighborhoods of Philadelphia, resulting in 65 qualified subjects participating. Each subject was coded for various social factors, and the speech data were digitized, segmented, analyzed, cleaned and normalized. The following chapters represent analyses conducted on these coded variables and these normalized mean data.
C H A P T E R  4

A N A L Y S I S ,  R E S U L T S  A N D  D I S C U S S I O N  O F  ( a y 0 )

4.0  I N T R O D U C T I O N

The purpose of this chapter is to outline the results of the analysis of the variable (ay0) and to discuss these results as they relate to issues regarding language change and variation. Before the specifics regarding this variable can be discussed, it is important to sketch the entire vowel system of the speakers of the Philadelphia dialect in the 2000s.

4.1  T H E  P H I L A D E L P H I A  V O W E L  S Y S T E M  I N  T H E  2000s

In order to gain a better understanding of any one variable, it is first important to examine the overall picture. To do this, I will describe a few speakers’ entire vowel system as it pertains to the Philadelphia sound changes discussed in Labov (2001).

4.1.1  D E N A  S I M P S O N ,  40:  A N  A D V A N C E D  S Y S T E M

Figure 4.1 is the system of Dena Simpson, a 40 year old woman raised and still living in Fishtown, a northeastern neighborhood of Philadelphia adjacent to Kensington. As shown in the figure, Dena Simpson’s vowel system represents one version of an advanced Philadelphia configuration. These data have been normalized, so F1 and F2 values are comparable to other speakers and to the overall means for all speakers. In the following figures of vowel systems, the word class /ɜ/ is inconsistently depicted as “ɜhr”, “*hr” or “ɜ”, however they all represent the same word class, as in the word “girl.”
Figure 4.1 The vowel system of Dena Simpson, 40, Fishtown

Dena’s system is similar to Barbara Corcoran’s system from the LCV as described in Labov (2001, p. 138) and reprinted here as Figure 4.2. Barbara, a 16 year old working class girl in the 1970s, is comparable to Dena in age and class. The following description of her vowel system adopts the same terminology as Labov (2001), so the descriptive terms for the relative age of the changes are in relation to the point in time of the LCV.
Looking first at the nearly completed changes, (ohr) and (owr), which are merged and only represented as (ohr) in the LCV data, have reached high back position along with (oy) in Dena’s system. On the front part of her system, (æh) has reached an upper high position, although it is not as high as /iy/. Unlike Barbara, (oh) in Dena’s system has not reached high back position, but rather only slightly higher than /owl/, which is in mid back position.

Regarding the mid-range changes, (uw) and (ow) do not show fully fronted realizations, but rather more moderate central positions. Note that the subclasses of the (uw) variable have changed, so this part of the picture is not comparable to the LCV data.

With respect to the new and vigorous changes, Dena’s system looks as extreme as Barbara’s. (aw) has risen to a high position, but not as high as /iy/. Like Barbara, Dena has a system where (eyC) and (eyF) are separated, but unlike Barbara’s system, (eyC) in
Dena’s system has not moved to high front peripheral position to overlap with /iy/.

Finally, Barbara’s system shows a split between (ay0) and (ayV), with the former being more centralized. Dena’s system also reflects this split, but shows a more extreme distance between the two allophones.

In addition to these above changes, Dena’s system reflects some of the incipient changes discussed regarding the LCV data. The front lax vowels (i), (e) and (æ), show a more centralized realization, with accompanying lowering of (e). Another major difference between the two systems is the realization of (Λ) in lower mid back position in Dena’s system.

4.1.2 Marcia Finnegan, 19: An Advanced Younger Female System

While Dena and Barbara Cocoran are comparable in age in 2004, Barbara Cocoran and Marcia Finnegan are age cohorts 30 years apart. By comparing these two speakers, we can see how the vowel systems have changed in 30 years in a real time comparison. Figure 4.3 is the system of Marcia Finnegan, a 19 year old woman raised and living in Fishtown. These data have also been normalized, so F1 and F2 values are comparable to other speakers and to the overall means for all speakers.

Starting with the nearly completed changes, just like in Dena and Barbara’s systems above, (ohr) and (owr), which are merged and represented as (or) in Marcia’s system, have reached high back position along with (oy) and (uw/). Along the front part Marcia’s system, (æh) has reached an upper high position, although it is not as high as /iy/. Unlike Barbara, and like Dena, (oh) in Marcia’s system has not reached high back position, but is rather only slightly higher than /owl/, which is in mid back position.
Regarding the mid-range changes, \((uw)\) and \((ow)\) do not show fully fronted realizations, but rather more moderate central positions like in Dena’s system. Although \((ow)\) in Marcia’s system is similar to Dena’s system, \((uw)\) shows fronting for both subclasses \((Kuw)\) and \((Tuw)\) where \((Kuw)\) has caught up, and even surpassed \((Tuw)\) with respect to fronting.

Turning to the new and vigorous changes, Marcia’s system is not identical to the older version. First, \((aw)\) is no longer in a high position, but is in a more mid position. Like Barbara and Dena, Marcia has a system where \((eyC)\) and \((eyF)\) are separated, but unlike Barbara’s system, and similar to Dena’s system, \((eyC)\) in Marcia’s system has not moved to high front peripheral position to overlap with \(/iy/\). Finally, Marcia’s system
shows a split between (ay0) and (ayV), with the former being more centralized. In both Dena and Marcia’s system, the centralization of (ay0) does not include any movement along the F2 dimension.

Like Dena, Marcia also shows a system affected by the incipient changes. The front lax vowels (i), (e) and (æ), show an even more centralized realization, with accompanying lowering of both (e) and (i). Unlike Barbara’s system, and in agreeance with Dena’s system, Marcia’s system shows a realization of (ʌ) in lower mid back position.

4.1.3 ERNIE Sokowski, 45: AN ADVANCED MALE SYSTEM

4.1.1 and 4.1.2 represent examples of advanced female Philadelphian vowel systems comparable to the system described from the LCV data. Due to the powerful effect of speaker sex on the vowel system, it is necessary to portray the male counterpart to this advanced system. The vowel system of Ernie Sokowski represents this male version of an advanced system. Ernie, 45, is a South Philadelphian, working class laborer. He grew up in the neighborhood of Pennsport, which is stereotypically Irish in ethnicity, with increasing Italian influence. Despite the fact that his Polish ethnicity is rare in his community, Ernie is very involved in his neighborhood as block captain and is representative of his class, sex and generation. His system is shown in Figure 4.4 below.
Figure 4.4 The vowel system of Ernie Sokowski, 45, Pennsport

Ernie’s system is comparable to the advanced male system of Rick Corcoran from the LCV data (Labov, 2001, Figure 4.7, p. 141). Both men are in their mid-forties in 2004, and although they grew up in different neighborhoods, they both grew up at the lower end of the working class continuum. Rick’s system is reprinted below as Figure 4.5 for a visual comparison to Ernie.
While the two male systems share some common traits, there are a number of differences. In fact, Rick Corcoran’s system does not resemble any other male system in the current study’s data. However, with respect to the nearly completed changes, Ernie shows (ohr) in high back position, along with (oy). For simplicity, Ernie’s (owr) and (ohr) data have been combined and are represented as (ohr) in Figure 4.4. While (ahr) has achieved a mid back position as part of the chain shift with (ohr), (oh) is only slightly higher than (ahr). Both Dena’s and Ernie’s systems show less extreme raising of this variable than their LCV counterparts. Furthermore, unlike the high front realization in Rick’s system, (æh) achieves only a mid front status, just higher than /eyF/, in Ernie’s
system. There is, however, the characteristic split maintained between (æh) and (æ) in Ernie’s system.

Regarding the mid-range changes, Ernie’s system shows moderate fronting of both (ow) and (uw) with the same type of allophonic variation found in Dena’s system. For all speakers discussed above, the allophones of these variables before /l/ do not participate in this fronting and retain a back position. Since Ernie and Dena’s data are normalized, it is possible to compare phonetic positions and it is clear that for these variables, Dena’s system shows more front realizations. Unlike Dena, Ernie’s system shows more front realizations for the allophones of (uw) than (ow).

Turning to the new and vigorous changes, Ernie’s system is much less advanced with respect to (aw) and (eyC) than either his LCV or his female counterpart. (aw) has reached a lower-mid front status, similar to the height of (e), and between (æh) and (æ). While (eyC) shows a characteristic split from /eyF/, it does not overlap with either /iy/ allophones. Unlike (aw) and (eyC), (ay0) in Ernie’s system does reflect a more advanced system with respect to the change involved with this variable. While not as extreme as in Rick’s system, (ay0) has achieved a central and back status in Ernie’s system. If Ernie and Dena are representative of their sexes, then it is clear from these illustrations that (ay0) is involved in a mid realization for both of them regarding vowel height. While Dena’s (ay0) achieves a mid central position, Ernie’s clearly is raised along the back periphery, and has reached a mid back position.

In addition to these variables, there are incipient changes which are reflected in Ernie’s system which are not present in Rick’s system. The first is that the front lax vowels, (i), (e), and (æ) are relatively low and centralized. In fact, Ernie’s short front
vowels reach a lower position than his female counterpart, Dena. Finally, Ernie’s system shows a mid back realization of (ʌ), halfway between (o) and (oh) along the back periphery. This vowel is higher than in Dena’s system, although it does not achieve a high back position as it does in Rick’s system.

4.2 DEVELOPMENTS OF SOUND CHANGE IN APPARENT TIME

While the above descriptions demonstrate individual systems, it is important to portray the entire community in order to examine any individual sound changes in apparent time. Figure 4.6 shows the overall means of the entire vowel system based on the entire data set.

*Figure 4.6 Overall means of vowel system for all speakers*
From this sketch, a few observations can be made regarding and reconfirming the Philadelphia vowel system. First, regarding the front vowels, (eyF) and (eyC) show a separation, and (eyC) is more raised and peripheral than (eyF). There is also the short-a split, with lax (æ) occurring near a low and central position, and the tense counterpart (æh) at a mid-front peripheral position. Finally, (aw) is front and raised to a mid-front position. The historically back vowels (ow) and (uw) show moderate fronting with more severe fronting in certain allophonic environments (e.g., (Tuw) or /uw/ after coronals, vs. (Kuw), or /uw/ after non-coronals). The front upgliding diphthong (ay) shows a split, with a raised nucleus before voiceless consonants (ay0). The vowel (ʌ) is near a low-back position, while (oh) is raised to a mid-back peripheral position. Also occurring in a mid-back peripheral position is the vowel subclass (ahr). Finally, the high back peripheral position is occupied by a variety of vowel classes and subclasses, including (oy), (ohr), (owr), (uwr), and (uwl).

While this system shows some documented Philadelphian traits, it does not illustrate change in apparent time. By conducting a simple regression with age as the independent variable and F1 or F2 as the dependent variable, a sketch of possible sound changes can be constructed using the resulting age coefficients (Figure 4.7). The black circles represent the mean normalized values for each vowel class, as shown above in figure 4.2. If the age coefficient is significant, measured by t-values, then an arrow was drawn in the direction of the change. The mean age for the entire data set was calculated (46.3), and using the age coefficients and the constant calculated by the regression analysis, estimated formant positions for speakers 25 years younger and 25 years older than the mean age were computed. The tails of the arrows represent the estimated
formant positions for speakers 25 years older than the mean, and the heads of the arrows represent the estimated formant positions for speakers 25 years younger than the mean. If both formants have an age coefficient that is significant at the $p < .01$ level, than a solid arrow was drawn according to the most significant value. If the age coefficient for only one formant is significant at the $p < .01$ level, then an arrow was drawn based on that significance (a dotted arrow for F1 significance and a dashed arrow for F2). The figure below indicates which formant(s) are significant, and at what $p$ level.

![Formant positions diagram](image)

*Figure 4.7* Movement of Philadelphia vowels in apparent time
As shown above, 14 vowels are involved in change in apparent time involving at least one formant with a significant age coefficient at a minimum $p < .10$ level. Only 5 vowels are involved in significant changes of both formants: (e), (æ), (ahr), (ah), and (oh). The first formant of both (ay0) and (eyC) is involved in change in apparent time with an age coefficient significant at the $p < .001$ level. It appears that both vowels are involved in raising, although any differences in F2 are not significant. The analysis of (ay0) shows that the age coefficient of 1.22 is significant at the $p < .0001$ level, and over 30% of the variation is explained with $r^2$ at 0.32. The only other vowel involved in any significant change in F1 is (u), at the $p < .01$ level. According to the data, this vowel is lowering over time, but there are no significant signs of fronting or backing. Finally, there are the remaining vowels involved in change of F2. The most significant are (aw) and (æh), both at a $p < .01$ level. Both these vowels are backing, and changes in F1 are not significant. At the next significance level ($p < .05$), there are 3 vowels involved in change: (i), (Λ), and (Kuw). While the first two are backing, (Kuw) is fronting. Finally, the last vowel involved in change in F2 is (ayV). With an age coefficient significant at the $p < .10$ level, this vowel appears to be fronting.

4.3 (ay0)

One of the most significant sound changes identified in the analysis above as well as identified as a new and vigorous change from the LCV data is the raising of the nucleus of /ay/ before voiceless consonants. This section will examine the details of language change regarding this variable (ay0).
4.3.1 DEVELOPMENTS OF (ay0) IN APPARENT TIME

The first step in the investigation of (ay0) is to determine if sound change in apparent time can be identified. Although it was stated above that this was the case for this variable, a more detailed analysis focusing on this variable is presented here. A change in the height of the vowel, represented by F1 values, would show a relationship with age if change is in fact occurring. Figure 4.8 shows the mean F1 values of five ten-year age groups. There appears to be a monotonic relationship between age and the variable, although with a plateau for middle aged speakers.

![Figure 4.8 Mean first formant values of (ay0) for 10 year age groups](image)

While the above chart indicates a change in apparent time with the lowest F1 means in the youngest age group, this group only consists of 3 speakers. Therefore, to compensate for this, these speakers have been incorporated with the next youngest age group and the data have been redrawn on the chart in Figure 4.9 below.

---

1 Since these data do not include speakers under the age of 14, the issues regarding the disruption of a monotonic relationship by a peak in adolescence does not apply.
According to the classification criteria of variables discussed in Labov, 2001, this variable still shows a strong movement in apparent time. Over 30% of the variation is explained by age, there is a strong age coefficient, and it is at the $p < .0001$ level of significance.

4.3.1.1 DEVELOPMENTS OF (ay0) IN APPARENT TIME: OTHER INDEPENDENT VARIABLES

Now that (ay0) has been shown to be involved in change, the next step of investigation for this variable is to examine if other independent social variables affect the outcome of (ay0). In order to examine all the independent variables at the same time, a stepwise multiple regression analysis was conducted using the following independent social variables: age as a continuous variable, sex, education, occupation, residence value, mobility, house upkeep, ethnicity, foreign language, generation, and neighborhood of origin. Each independent variable is included in the algorithm, and categorical
variables (such as sex and socioeconomic class category) are entered as dummy variables, using a sum-to-zero coding system. The stepwise process selects the most significant variables to enter into and be removed from the model at pre-selected p values (0.10 to enter and 0.10 to leave for this analysis). From this information, a multiple regression model is constructed based on the independent variables the stepwise model shows meet the significance requirement.

The stepwise regression analysis of (ay0) selected age, occupation and generation as significant factors in predicting F1 values of the linguistic variable. Although the model did not select sex as a significant variable, more detail about sex and its possible effects will be discussed later. Table 4.1 shows the age coefficient, p value for the selected independent variables and the adjusted $r^2$ of this model. While age is still significant at the p < .0001 level, the $r^2$ has increased to 46% of the variation explained by the model. This model can account for more of the variation than the model based on age alone. Furthermore, the lack of fit F value (0.1622) is not significant at the p < .10 level, indicating that there are no interactions or that nothing has been left out which could add to the explanatory power of the model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
<th>Coefficient</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt; 0.0001</td>
<td>0.1523</td>
<td>0.46</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.0132</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generation</td>
<td>0.0305</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As shown above, age can be transformed into a categorical variable that illustrates change by ten year increments. This classification of age was entered into the regression analysis in lieu of age as a continuous quantifiable variable. Predicted mean F1 values of (ay0) by ten year age group were calculated. These predicted values allow comparisons of age levels while other factors are being held neutral. If we want to see the effects of just age on a variable and hold any other significant independent factors fixed at a neutral level, then we examine the least squares means calculated by the regression model discussed above (equivalent to expected or predicted values in other models, like the analysis of the LCV data in Labov, 2001). This operation is conducted in order to check and correct the assumption of linearity made when age is used as a quantitative variable. Figure 4.9 from above has been redrawn in Figure 4.10 using the least squares means instead of the raw mean scores. Although the picture does not appear to change much, by using the predicted values from a multiple regression model with age as a categorical variable, a more linear relationship appears between age and the variable as the plateau shown above in the middle ages transforms into a slope.

*Figure 4.10* Predicted first formant values of (ay0) for age groups
In order to investigate the factors selected by the stepwise process as significant, it is necessary to first examine the effect the whole category (occupation or generation) has on the overall model (measured by the F values). The model discussed below is the model with age as a continuous variable. The probability F scores for each independent variable are shown in Table 4.2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.0132</td>
</tr>
<tr>
<td>Generation</td>
<td>0.0305</td>
</tr>
</tbody>
</table>

The difference in probability levels of each variable’s effect on the model offers one piece of insight into why there is no difference in age effects when these other variables are omitted from the model. Neither occupation nor generation reaches a significance level of <.01, but since both are significant at the p < .10, they were selected in the stepwise regression analysis. Table 4.3 shows a break down of each category into its respective levels (scores). The categorical levels with the most significant values at the p < .01 level (in bold italics) are the occupation score of 3 and generation score of 3. Occupation score of 4 is significant at the p < .05 level (bolded). Finally, the categorical levels significant at the p < .10 level (in italics) are an occupation score of 5 and a generation score of 1.
Table 4.3 Probability of regression parameters of the categorical variables by level

| Variable | Estimate | Prob > |t| |
|----------|----------|--------|---|
| Age      | 1.523    | < 0.0001 |
| Occ[1]   | -6.375   | 0.551  |
| Occ[2]   | 6.853    | 0.556  |
| Occ[3]   | -27.279  | 0.0035 |
| Occ[4]   | 20.220   | 0.043  |
| Occ[5]   | 13.089   | 0.086  |
| Occ[6]   | -6.508   | 0.393  |
| Generation[1] | -24.787 | 0.092  |
| Generation[2] | -5.699  | 0.477  |
| Generation[3] | 21.123  | 0.0045 |
| Generation[4] | 9.363   | 0.245  |

As shown in the table above, these significant differences within each category are in relation to the estimate, which is calculated in this analysis with a sum-to-zero coding system. In simple regression, the parameter estimate (also called the coefficient) is the difference in the mean of one level of a category from the mean of the means of all levels of the category (the category grand mean). In multiple regression analysis, means are substituted with the least squares means (which are the means of each level/category established by the model while holding all other covariant variables fixed.) Basically, these parameter estimates represent the comparison of that level with the average effect across all levels while holding other significant factors in the model fixed. This information shows the clearest possible picture of how any independent variable affects the dependent variable, as well as the patterning of levels within each categorical independent variable.

In the case of (ay0), the least squares grand mean for the model is 707.133. The following values can be discussed in terms of Hz. since the dependent variable is
measured in Hz. So, the estimate in the table above shows where the least squares mean for each level is in relation to the mean of the least squares means. Unlike other analyses using dummy variables, this analysis does not treat one variable as the residual one, but compares each level of a categorical variable to the mean of the category.

With respect to the generation category, only two scores show significant differences from the least squares grand mean of this category (707.133). A generation score of 3 (indicating third generation Philadelphian) shows an increase from the least squares grand means of 21.123 Hz significant at the $p < .01$ level. Conversely, a generation score of 1 (first generation Philadelphian) shows a decrease from the least squares grand means by 24.787 Hz, although only at a $p < .10$ level. The effects of generation on the F1 of (ay0) are shown in Figure 4.11 below.

Figure 4.11 Generation scores based on regression estimates (least squares means)

The above picture regarding generation indicates that the more established speakers, or the speakers who have been a part of the Philadelphia speech community for
more than two generations, show the most conservative effect on the variable with respect to the direction of the change. This pattern further indicates that the newest members of the speech community have the most innovative effect and are more likely to produce raised variants of the variable than the speakers in the more established families. This suggests that the new groups re-interpret and develop the changes in progress beyond the level of the older groups.

While the data support the above discussion regarding the generational effects on the variable, it is important to examine the effect of generation in more detail. First, the data indicate that all of the 3 speakers with a generation score of 1 are located in the lower middle class and are over 60 years old. While multiple regression is designed to compensate for skewing of the distribution of the data, it is clear that these data may not be reliable due to the low number of speakers in this group. First, the standard error for generation score of 1 is 19.16 (over double of any of the other level’s standard error). Second, as shown in Figure 4.12, the raw mean scores for the group do not match the least squares means, and the pattern is completely different.

![Figure 4.12 Generation scores of least squares means and raw means compared](image)
Finally, as shown in Figure 4.13, the three speakers with a generation score of 1 are not evenly dispersed around the mean, with one speaker as an extreme outlier. Due to all of these pieces of the puzzle, the significance of generation score of 1 is highly suspect and will be subsequently be set aside as a significant variable.

*Figure 4.13 Distribution of F1 (\(\text{ay}_0\)) means by generation score*

Although the significance of the effects of a generation score of 1 on values of \(\text{ay}_0\) is questionable, the significance of generation score of 3 does not fall into any of the above discussion regarding lack of data or the presence of extreme outliers. The makeup of the speakers with a generation score of 3 includes all age categories and all social classes. This therefore appears to be a genuinely significant factor regarding \(\text{ay}_0\).

Now that the generation effect has been discussed, the effects of occupation scores need further investigation. As stated above, the occupation score of 3 has a significant effect predicting lower values of \(\text{ay}_0\), but a score of 4 shows a significant
effect predicting higher values of (ay0). While the curvilinear hypothesis suggests that
the interior social classes lead the change, the case with (ay0) from these data show that
the occupation scores aligned with the interior social classes (3 for upper working class
and 4 for lower middle class) should theoretically predict lower values of (ay0) indicating
more raised variants. Regarding these data, however, this pattern does not emerge, as
shown in Figure 4.14 below.

Figure 4.14 Occupation scores based on regression estimates (least squares means)

As illustrated above, the occupation score of 3 is the most significantly different
(p < .01) from the least squares grand mean, subtracting 27.279 Hz. This indicates that
speakers who are assigned an occupation score of 3 produce higher vowels than the mean
of all speakers, and with respect to this variable, are leading the change. Likewise, the
occupation score of 4 shows the highest values from the least squares grand mean
indicating the lowest variants of the variable. While the patterning of occupation scores
for this variable do not conform perfectly to the curvilinear hypothesis, data from the
LCV as discussed in Labov (2001) show a similar trajectory with a large divergence between the upper working class and the lower middle class for some variables (Figure 5.7, p. 171). Since this picture is not clear, it is necessary to examine the larger variable of social class.

### 4.3.1.2 Developments of (ay0) in Apparent Time: Social Class

While strong movements in apparent time have typically been accompanied by the curvilinear hypothesis (Labov, 1994, 2001), the case of (ay0) was an anomaly from the LCV data. According to the analysis of the current study, this situation has not changed. In order to examine the effects of social class on the variable, social class category was substituted for occupation as a factor in the multiple regression model, with age as a continuous variable and generation as another factor.

As shown in Table 4.4, social class category as a whole (SEC) does not show a significant effect on the variable (at p < .10), while the other variables continue to do so.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>SEC</td>
<td>0.3425</td>
</tr>
<tr>
<td>Generation</td>
<td>0.0368</td>
</tr>
</tbody>
</table>

As shown in Table 4.5, none of the individual levels of the SEC variable show a significant effect at the p < .10 level, and only a generation score of 3 shows a significant effect at p < .01 level.
Table 4.5 Probability of regression parameters of the variables by level

| Variable    | Estimate | Prob > |t| |
|-------------|----------|--------|---|
| Age         | 1.426    | < 0.0001 |
| LWC         | -1.292   | 0.8776 |
| UWC         | -13.690  | 0.1238 |
| LMC         | 9.903    | 0.1813 |
| UMC         | 5.079    | 0.4439 |
| Generation[1] | -23.570 | 0.1528 |
| Generation[2] | -7.330 | 0.4047 |
| Generation[3] | 23.063 | 0.0064 |
| Generation[4] | 7.837 | 0.3515 |

Using the information from the multiple regression analysis, it is possible to plot predicted mean values of F1 of (ay0) by using the coefficients and constants resulting from this multiple regression model. Again, these predicted values are better estimates of one independent variable’s effect on the dependent variable because the other factors are held neutral. Figure 4.15 shows the difference in predicted values versus raw mean values for F1 (ay0) by social class.

Figure 4.15 Predicted and raw mean F1 values of (ay0)
This figure illustrates the upper working class with the most extremely raised variants of all the groups, but as the regression analysis indicates, social class does not show a significant effect on the production of this variable. These findings from the current study mirror the same lack-of-class distinction found in the LCV data (Labov, 2001, p. 172). Despite these facts regarding the insignificance of social class, Figure 4.16 plots the trajectories of the change for each social class. This figure represents the results from the multiple regression model, with age as a categorical variable and sorted by social class. The values are the estimated values calculated by the model as the least squares means (mean values which include the constant and coefficients of the other variables included in the model).

Figure 4.16 Estimated mean F1 values of (ay0) by age category and social class
As shown above, this variable does not follow the social class patterns suggested by the curvilinear hypothesis. Due to lack of data, there are no LWC speakers in the 50-59 age group, and no UWC speakers in the 40-49 age group, so lines have been drawn to span the gap of missing age categories for any social class. The above chart illustrates that for this variable, each age category shows a different distribution across social class, so that in one ten year span, the lower middle class shows the most raised variants, while in another it is the upper working class or lower working class. In fact, every social class shows the most raised variants at one point in the age category range. In order to get a clearer illustration of the distribution of this variable by social class, linear regression trend lines were added to Figure 4.16 and the mean data values were removed. These results are shown in Figure 4.17 below.

Figure 4.17 Trend lines for F1 values of (ay0) by age category and social class
Although there is not a significant effect of social class on the data as indicated in the regression model, there is a different distribution in the rate of change for the various social classes. The middle classes and the upper working class show a less vigorous change, while the lower working class shows a more extreme change. If a simple regression is conducted on the data for this variable with age as a continuous variable for each social class, then these differences are represented by stronger coefficients reflecting steeper slopes in the regression lines. The constants, coefficients and p values are shown in Table 4.6 below.

| Class | Constant | Coefficient | Prob > |t| |
|-------|----------|-------------|--------|---|
| LWC   | 627.235  | 1.8778      | 0.0063 |
| UWC   | 608.013  | 2.1367      | 0.0038 |
| LMC   | 682.729  | 0.7762      | 0.0580 |
| UMC   | 690.386  | 0.6386      | 0.0816 |

While social class was not selected as significant with these data, the table above shows that the different social classes show different pictures of the advancement of this change. The information in Table 4.7 does not match the picture illustrated in Figure 4.17. This is due to the lack of data in all age categories for the working classes, which causes a discrepancy between the two models where age is a continuous or a categorical variable. Since the model with age as a continuous variable is more reliable (there are no gaps in the data), the regression lines have been redrawn and are shown in Figure 4.18.
The following discussion utilizes this model with age as a continuous variable. The highest coefficient and lowest probability level is in the upper working class. This class has the steepest slope and shows the variable advancing faster than the other classes. The lower working class follows this lead, with a smaller coefficient. Both working classes show that age has statistically significant effect on the production of this variable at the $p < .01$ level. The middle classes also show age as having an effect on the variable, but with smaller coefficients, less steep regression lines, and only significant at $p < .10$. As figure 4.17 illustrates, this change of rate of advancement happened around the fifty year old category. A study conducted thirty years ago would only have started to see this effect in the twenty and under age group. Therefore, the results from the analysis of the current study support the findings from the LCV showing the upper middle class as being the most advanced with respect to this variable.
4.3.1.3 DEVELOPMENTS OF (ay0) IN APPARENT TIME: SEX

As the current study has shown using an apparent time analysis, this variable is involved in change. Although social class does not show a statistically significant effect on this variable, the rate of change is not the same for all social classes. These findings thus far support the findings of the LCV study conducted thirty years ago. However, one of the significant factors that emerged from the LCV data was speaker sex. While sex was not selected from the stepwise regression process on these data for this variable, I will show the distribution of this variable in apparent time by sex. In order to examine sex, this factor was included in a multiple regression analysis with F1 values of (ay0) as the dependent variable and age as a continuous variable, occupation and generation as the independent variables. This analysis shows that sex does not have a significant effect at the p < .10 level (p = 0.5163). This is a major change from the results of the data thirty years ago. A more graphic illustration of the insignificance of sex on the variable is shown in Figure 4.19 below. This chart represents a density ellipse by sex at the 0.90 confidence level, including the fit line for both sexes.

As this figure illustrates, the ellipses to include 90% of the data for each sex are nearly identical, as are the fit lines. While both the male fit line and ellipse are higher with respect to this variable, according to the multiple regression analysis, this difference is not statistically significant.
Although sex does not show a significant effect on the variable in these data, occupation does. As discussed in Labov (2001), the LCV data show a significant effect of sex on the variable (with men leading the change). Additionally, the LCV data show that although men do not appear to be stratified based on occupation scores, the women do. According to the LCV data, the lower the occupation score for the women, the lower the F1 values (indicating a higher vowel) of (ay0). In order to investigate if this stratification occurs for either sex in the current study, a multiple regression model was constructed using age as a continuous variable, generation, occupation and sorted by sex. Figure 4.20 illustrates the results of this analysis by showing the least squares means for each occupation score for both sexes. To orient the scale, an occupational score of 1 represents the lower working class, while a score of 6 represents the upper middle class.
As the figure shows, the clear differentiation for women found in the LCV data is not replicated in the current data. Additionally, there is an unfortunate gap in the data so that no men received an occupation score of 2. In all likelihood, since there is little difference between men and women regarding the other occupation scores, the male occupation score of 2 would be similar to the female score. In conclusion, these data do not show the same sex-based stratification found in the LCV data.

4.3.1.4 DEVELOPMENTS OF (ay0) IN APPARENT TIME: SEXUAL ORIENTATION, GENDER

Following the goals of this dissertation, the possible effects of sexual orientation and gender (based on the gender index discussed in Chapter 3) were investigated. By adding sexual orientation as a binary categorical variable to the multiple regression model discussed above (with age as a continuous variable, occupation and generation as significant independent variables), it is possible to examine whether this factor has any significant effect on predicting F1 values of (ay0). The results of the model show that
sexual orientation, with a p value of 0.9478, does not have a significant effect on the linguistic variable.

The next step in investigating the various aspects of gender developed in this dissertation is to examine the possible effects of sexual orientation and sex combined. Using the sexual orientation scale from the gender index (which codes for sex at the same time as sexual orientation), another regression model was constructed. Since neither sex nor sexual orientation show significant effects on (ay0), it is not surprising that the combination of the two does not show any significant effects either. The p value for this factor is 0.6660.

Finally, the cumulative score of the GI was tested for a significant effect on predicting F1 values of (ay0). Using each possible raw score as a categorical variable, with a p value of 0.9998, this social variable does not show any significant effects on (ay0). Likewise, using the GI categories discussed in chapter 3 (masculine, feminine and neutral) turned up insignificant results (p value of 0.3179).

Based on these analyses, none of the gender-based social variables developed in this dissertation play a significant role in predicting F1 values of (ay0). This may be related to the loss of significance that sex has on the variable with these data, or it may be due to the failure of the gender index to capture any patterns of the speech community.

4.3.1.5 DEVELOPMENTS OF (ay0) IN APPARENT TIME: F2 DIMENSION

The previous discussion has focused on the height dimension regarding this variable. While F1 of (ay0) shows a significant age effect as a change in progress, the F2 dimension does not. In addition, the data from the LCV was really only examined in
relation to the height of this variable. However, the F2 dimension does show some patterns with respect to social factors, although age does not show a significant effect on this aspect of the variable.

A multiple regression model was constructed of F2 values of (ay0) using sex and social class as factors. The p values of the effect of each categorical variable on the overall model indicate that sex is significant at the p < .10 level (p = 0.0952), while social class (SEC) reaches a significance level at p < .001 (p = 0.0003). In order to clarify these factor effects on the F2 values of (ay0), another model was constructed with a simple regression of F2 of (ay0) against social class and sorted by sex. For women, social class is not a statistically significant effect on the F2 values of (ay0), even at the p < .10 level. However, for men, social class is a significant effect at the p < .001 level. This indicates that the male population is stratified by social class with respect to the F2 values of this variable, while the women are not. By using the predicted F1 and F2 values (least squares means) from a regression model with social class as a factor and sorted by sex, it is possible to construct a visual image of this stratification. Figure 4.21 illustrates these social class differences for both sexes and for all four social classes.
While age is not a factor in predicting F2 values of (ay0), the above graph demonstrates that there are differences in the progression of the change of F1 values of (ay0) depending on social class and sex. Furthermore, it is the lower working class men with the most raised and backed values of (ay0). With respect to the raising aspect of the change in progress of this variable, then it is this group who are now ahead of the rest.

Since sex does show significant effects on the F2 dimension of (ay0), it is necessary to examine possible effects of sexual orientation and gender as well. Neither sexual orientation as a categorical variable, nor the sexual orientation and sex combined categorical variable show a significant effect at the p < .10 level (p values of 0.5843 and 0.3294 respectively). Additionally, GI as individual categorical scores in a model with social class category does not show a significant effect (at a p value of 0.1535). Finally, GI category does not show a significant effect (p value of 0.1383) on the F2 dimension of
(ay0) when part of the multiple regression model with social class category. Based on these different analyses, the only sex or gender scale to show any significant effect on F2 of (ay0) is the binary categorical variable of sex.

4.3.1.6 SUMMARY OF DEVELOPMENTS OF (ay0) IN APPARENT TIME

As the discussion above has outlined, the only significant social factor regarding the raising of the nucleus of the diphthong /ay/ before voiceless consonants (ay0) is age. This indicates that this variable is still involved in change in apparent time, but that other factors such as social class, sex, sexual orientation and gender do not show any significant effects predicting F1 values of (ay0). Examining the overall picture including F2 values of this variable, it becomes clearer that while social class and sex do not play a role in predicting F1 values of (ay0), there are some effects of social class and sex regarding the front-back dimension (which is not implicated in change based on these data). Furthermore, from the information presented above, these data show an atypical picture regarding language change. Not only was this change led by men (as shown in the LCV data), but it was also the upper middle class who appear to be in the lead. The picture in the last thirty years has changed, however, and it is now the lower working class men with the most extremely backed and raised variants of this variable. In conclusion, this sound change appears to have begun with the upper end of the social spectrum and has now been overtaken by the lower end of the social spectrum.
4.3.2 DEVELOPMENTS OF (ay0) IN REAL TIME

The developments of (ay0) in apparent time using data from the current study are comparable to the data analyzed from the LCV (Labov, 2001). Although some of the findings discussed above differ from the findings of the LCV, both studies have shown this variable to be involved in change in the same direction in apparent time. Furthermore, the real time data used by the LCV do not differentiate between (ay0) and (ayV), with one source (Tucker) stating that there are no differences between voiced and voiceless finals (Labov, 2001, p. 130), which leads Labov to identify this variable as a new and vigorous change. Using data from the LCV study based on 86 speakers (not including data from the upper class speakers from Kroch, 1996), a real time analysis was conducted. The following sections will discuss the results from this analysis.

4.3.2.1 DEVELOPMENTS OF (ay0) IN REAL TIME: AGE

The same stepwise process using JMP IN was conducted on the LCV data as described above regarding the current study. As predicted by the analysis in Labov (2001), sex and age were selected as significant factors, as well as education, residence, mobility and neighborhood. However, when the regression model is constructed with these factors, there is a problematic relationship between neighborhood and residence causing the model to be questionable and the program does not compute least squares means for the independent variables. Therefore, two regression models were constructed separating these two interacting variables. Excluding neighborhood from the model, only age and sex show significant effects on the variable at the p < .10 level. However, excluding residence from the model, age, sex and neighborhood show significant effects
on the variable at the p < .10 level. Although the stepwise process selected mobility and education as significant factors, neither multiple regression model shows a significant effect of either these factors on the variable. Therefore, the following discussion involves a multiple regression model with sex, age and neighborhood as the factors included. Although this model shows an adjusted $r^2$ of 0.437 (43.7% of the variation explained by the model), it also shows a lack of fit F value (0.0641) significant at the p < .10 level. This indicates that model based on these three independent variables is not the best fit. Therefore, in order to construct a model with an insignificant lack of fit test, either more variables need to be added (which do not show significant effects on the variable as discussed above), or the neighborhood variable needs to be omitted. A model based on the latter choice, with age as a continuous variable, and sex, shows an adjusted $r^2$ of 0.337, which indicates a good fit with one third of the variation explained by the model. Additionally, the lack of fit F value (0.2601) is not significant at the p < .10 level, indicating that there are no interactions of the independent variables or that nothing has been left out of the model which could add to the explanatory power of the model.

Using the least squares mean values (which include the constant and coefficient while holding other variables fixed), and transforming age to a categorical variable, Figure 4.22 was constructed of the LCV data to illustrate change in apparent time. In order to be consistent with the analysis of the OMM data, the speakers under 30 in the LCV data are grouped together into the under 30 age category. Furthermore, these ages represent the age of the speaker at the time of the interview (in the 1970s).
In order to compare the two data sets, Figure 4.22 was then combined with 4.9 from above and redrawn in Figure 4.23 below. This illustrates the apparent time distribution for both studies. Since both data sets were analyzed using the same sum-to-zero coding system adopted by JMP IN, neither data set contains a residual age category.
While there is a difference in comparable age groups thirty years later, these two data sets unexpectedly converge at the youngest age indicating that the youth thirty years ago produced nearly identical variants of this variable as the youth of the current study. (This coincidental anomaly of near-identical values for the youngest age group in both data sets becomes clearer in Figure 4.25 below when the LCV data are converted to the age groups of the OMM data set.) The least squares means for this age group in the LCV data is 673.2882, and in the OMM data, it is 672.7552. Since the progression of this variable in both data sets is not identical, and the values for corresponding ages are not the same, an age grading interpretation can successfully be dismissed. A change in progress interpretation is even clearer when trend lines are added to the above chart (shown in Figure 4.24 below). Because the trend lines are not identical, an analysis that these data represent a change in real time is supported. Furthermore, these trend lines are not parallel, which indicates a difference in slope which further indicates a difference in the rate of change, with the LCV data showing a slightly steeper slope.

*Figure 4.24 Predicted (ay0) values for both studies with trend lines*
In order to investigate the complete picture, both data sets were combined and thirty years were added to the LCV speakers’ ages. A stepwise regression model was run on these combined data, selecting age, sex and education as significant factors. Using the least squares means from this model, Figure 4.25 shows the results of this analysis as language change in real time.

Figure 4.25 Predicted F1 values of (ay0) for both LCV and OMM data sets

Based on these data, there is evidence of a change in progress. In addition, this step-like change supports the discussion of this variable in Labov (2001). There are two sharp increases in the rate of this change, which have been circled in the figure above. The first is from speakers over 90 to speakers in their eighties. This is the first step of the change, with the first speakers beginning to distinguish (ay0) from the other allophones of the entire /ay/ class. Then, in speakers under 60, another increase has occurred.
4.3.2.2 DEVELOPMENTS OF (ay0) IN REAL TIME: SEX

Since sex was selected in the stepwise process as a significant factor in the combined data, and following the discussion in Labov (2001), the combined data were separated by sex in order to examine sex differentiation in the progress of this change. When the model is constructed with age as a categorical variable, sorted by sex and including education as a factor, there is a significant lack of fit with the men’s data at the p < .01 level (F value of 0.0057). In an attempt to avoid interacting factors, the more encompassing variable of SEC was substituted for education. In this model, however, there is a significant lack of fit with the women’s data at the p < .05 level (F value of 0.0322). Therefore, a simple regression model was constructed with only sex and age as a categorical variable. The predicted F1 (ay0) values and $r^2$ values from this model are shown in Figure 4.26 below. In addition, the regression lines and age coefficient from a model with age as a continuous variable are displayed.

![Figure 4.26 Predicted F1 (ay0) values for combined data sets sorted by sex](image)
As shown above, there are moments in time when there is little sex-differentiation of this variable (80-89 year olds). However, the regression model with age as a continuous variable and sex indicate that there is a significant sex effect on the variable ($t$ value of 0.0276) at the $p < .05$ level. Unlike the findings from the LCV, however, the slope (age coefficients) of the regression lines for both sexes is nearly identical, but the adjusted $r^2$ is greater for the women. Contrary to the analysis of the LCV data (Labov, 2001), the first step of centralization occurred simultaneously for both men and women (as shown by the near identical values for the 80-89 age group). From that point, gender differentiation occurred, with men ahead with respect to centralization. This differentiation exists due to the shift away from centralized variants by women in the 70-79 age group. Then, the entire community shows a sharp increase in centralization for the 50-50 age group, while maintaining sex differentiation. The differentiation diminishes in the next ten year age group (40-49) as the women catch up to the men. However, in the two youngest groups, there is a retreat from centralization, which is more severe for women, causing sex differentiation again.

4.3.2.3 DEVELOPMENTS OF (ay0) IN REAL TIME: OCCUPATION AND SOCIAL CLASS

As previously discussed, according to the LCV data, women show a relationship between occupation score and amount of centralization. The men do not show any stratification of this kind. Based on the combined data set, a regression model was constructed using age as a continuous variable, occupation and sorted by sex. The predicted values for each occupation score for both men and women are shown in Figure 4.27 below.
The clear stratification of women by occupation from the LCV data alone has disappeared. All occupation scores show sex differentiation, but occupation was not selected as a significant factor predicting F1 values of (ay0) for either sex. The biggest difference from this analysis and the discussion in Labov (2001), is in the lowest and highest occupation scores of the women. There is no longer a large sex differentiation in the highest occupation score of 6, and the lowest occupation score maintains sex differentiation. These two discrepancies from the LCV analysis may be due to adding more data into the analysis, or they may be due to a difference in occupation score methodology. As previously discussed in Chapter 3 of this dissertation, the occupation scores were updated for the current study, and this may be causing these differences.

Although occupation is not identical to social class, it is possible to examine social class in order to understand the further stratification of the speech community with
respect to this variable. Using the combined data set, a regression model is built for each social class using age as a continuous variable and sex. The same pattern emerges from the combined data that emerged from the current study’s data alone. Despite the fact that social class was not selected as a significant factor in predicting F1 values of (ay0) for either data set, individually or combined, the rate of change is different for each social class. Figure 4.28 illustrates these different rates represented by different slopes in the regression lines.

![Regression lines for each social class of F1 (ay0) for both studies](image)

*Figure 4.28 Regression lines for each social class of F1 (ay0) for both studies*

This change is progressing more quickly and vigorously with the working classes, but the lower middle class is still progressing, yet at a slower pace. The upper middle
class does not show the same trend with respect to the rate of change. However, for all classes, age is still a significant factor in predicting values of (ay0) at the p < .10 level. Furthermore, this variable shows the most raised variants for the oldest speakers in the upper middle class. Based on these data, the middle classes appear to be more advanced than the working classes for speakers older than about 70. The working classes then surpass the middle classes with respect to this variable. While this variable has shown atypical behavior in the LCV data, one interpretation for this behavior is that this change was in fact started by the upper middle class, but has become more advanced and extreme in the working classes in the last 30 to 40 years.

4.3.2.4 DEVELOPMENTS OF (ay0) IN REAL TIME: F2 DIMENSIONS

While F2 (ay0) was not selected as having a significant age effect in either OMM or LCV data set alone, the combined data set was examined with respect to the F2 dimension. A stepwise regression model was conducted for F2 (ay0), and age as a continuous variable, occupation, residence and education were all selected as significant factors in predicting F2 values of (ay0). However, when a multiple regression model was created with SEC (the combination of occupation, residence and education) and age as a categorical variable, the lack of fit test reached significance at the p < .05 level (F value of 0.0238). Although sex was not selected as a significant variable from the stepwise process, when it is added to the model, the F value increases to 0.4017, no longer significant at the p < .10 level. This model indicates a better fit, although only 8% of the variation is explained ($r^2 = 0.0847$). In this model, age shows a significant effect at the p < .10 level (p vale of 0.0726) and SEC shows a significant effect at the p < .05 level (p
value of 0.0321). The predicted F2 (ay0) values for each age group from this model are shown in Figure 4.29 below.

![Figure 4.29 Predicted F2 (ay0) values by age groups for combined data](image)

As illustrated in the above figure, the combined data show a steady backing of the variable. This change in real time is not suggested by either apparent time analysis of the data. In addition to age, SEC was also selected as a significant factor in predicting F2 values of (ay0). Using a model with age as a categorical variable and sorted by SEC, the predicted F2 values are calculated and plotted for each SEC for age groups in Figure 4.30 below.
The above figure does not illustrate any clear picture of language change and social stratification. None of the social classes show a linear relationship with age. However, age is a significant factor in predicting F2 (ay0) values in only the working classes: LWC with a p value of 0.0354 and UWC with a p value of 0.0205. This suggests that the backing dimension of this variable is only realized in the working classes, with the middle classes showing no significant change in this dimension.

4.3.2.5 DEVELOPMENTS OF (ay0) IN REAL TIME: SUMMARY

Based on the above discussion, the combined data set showing change in real time gives us more insight into the mechanism of this male-led sound change. The initial analysis based on only the LCV data show a sound change originating from no sex differentiation progressing with instances of increased and decreased sex differentiation. By adding the current study’s data, and spanning over 100 years of ages of speakers, the picture of the mechanism of change alters slightly. The data show a picture of sex
differentiation after the change began by the whole community. This indicates that one sex (in this case women) recedes from the change once it began. Furthermore, there is a loss of sex differentiation about every 40 years (two generations). According to these data, sex differentiation is something that must be maintained, and can disappear for some generations. The concept of one sex retreating from the direction of the change is also supported by these data. In addition, while neither study shows a clear stratification based on social class, the combined data reiterate this fact, but suggest that there may be differences in the rate of change adopted by different social classes. Social class, however, remains an insignificant factor with respect to the centralization of (ay0). Finally, the combined data show change along the F2 dimension with a significant age effect, with the variable backing over time. While this dimension does not show sex differentiation, social class does show a significant effect. The social stratification, however, is not a linear picture, indicating that it may only be the working classes involved in change in progress with respect to the F2 dimension of (ay0).

4.4 Chapter 4 SUMMARY

The goal of this chapter was to further investigate the seemingly atypical behavior of one of the variables identified as a new and vigorous change from the LCV analysis. The data from the current study show that the raising of the nucleus of (ay0) is still involved in change in the same direction predicted from the LCV data. However, the sex differentiation found in the LCV data does not emerge from the OMM data. In the OMM data, the F2 dimension of this variable does not show a change in progress along this dimension, but it does show stratification by social class and sex. Furthermore, by
combining the OMM and the LCV data sets, the change in real time can be projected and a clearer picture of the mechanisms of change has emerged (centralizing and backing). Finally, none of the various gender scales created for the current study capture any patterns regarding either F1 or F2 dimensions of (ay0).
CHAPTER 5

ANALYSIS, RESULTS AND DISCUSSION OF
THE NEW AND VIGOROUS CHANGES (aw) AND (eyC)

5.0 INTRODUCTION

The purpose of this chapter is to outline the results of the analysis of the linguistic variables identified as new and vigorous changes: (aw) and (eyC). The following discussion will examine change in apparent time from the current study’s (OMM) data set in addition to change in real time by combining the LCV data with the OMM data.

Along with (ay0), (aw) and (eyC) show the strongest age effects on the production of these variables from the LCV data. Unlike (ay0), (aw) and (eyC) involve movement along the front-back dimension, or more accurately, along the front peripheral trajectory. Although the movement of both vowels can be described as raising along the front periphery of the vowel system, the major age effects were reflected in F2 production. The following sections will discuss how both of these variables still show age effects, but in different ways from those revealed by the LCV data.

5.1 (aw): A CASE OF LANGUAGE CHANGE REVERSAL?

As mentioned in Chapter 4, one of the other variables that shows a significant effect of age on vowel production is (aw). From the LCV data, this variable was one of the three variables classified as a new and vigorous change. According to the data in the 1970s, the nucleus of this diphthong is fronting and raising. However, the significant age effects were only located in association with F2. With respect to the effects of other
social variables, (aw) is the parade example of new linguistic change from below, with women ahead of men by about a generation and with a strong correlation of the curvilinear hypothesis. As the discussion below will illustrate, the evolution for this “typical” change from below has taken an unpredicted turn.

5.1.1 Change in Apparent Time: (aw)

Like the LCV data, the OMM data also show a strong age effect on the F2 values of (aw). Contrary to the LCV data, however, the current data show this variable to be backing over time; a reversal in the direction of the change. In order to illustrate the effects of age on the variable, a multiple regression model was constructed for F2 (aw) with age as a categorical variable (adopting the same age groups from the previous chapter), sex and social class as independent variables. The p values of each social variable and the $r^2$ for the entire model are shown in Table 5.1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.0441</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>0.0165</td>
<td>0.256</td>
</tr>
<tr>
<td>SEC</td>
<td>0.0233</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.1 Multiple regression model of F2 (aw)

This model can account for 26% of the variation, and all social variables are statistically significant at the p < .05 level. Figure 5.1 below shows the predicted F2 values (least squares means) from this model by age group.
Figure 5.1 Predicted F2 values of (aw) by age group

5.1.1.1 Change in apparent time: (aw): Sex, sexual orientation and gender

Both sex and social class show a significant effect on predicting F2 values of (aw), so it is necessary to examine each of these factors. First, by sorting the model by sex, a new picture of language change regarding this variable emerges. The results of this model are displayed in Table 5.2 below.

Table 5.2 Regression model of F2 (aw) sorted by sex with age and SEC

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
<th>$r^2$</th>
<th></th>
<th>Variable</th>
<th>p</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.0138</td>
<td>0.346</td>
<td></td>
<td>Age</td>
<td>0.8948</td>
<td>-0.144</td>
</tr>
<tr>
<td>SEC</td>
<td>0.0591</td>
<td></td>
<td></td>
<td>SEC</td>
<td>0.4101</td>
<td></td>
</tr>
</tbody>
</table>

As shown above, the women’s model shows a significant age effect (p value of 0.0138), the men’s decidedly does not (p value of 0.8948). This indicates that the significance of age as a factor in the combined sex model is attributed to the women’s
data. According to this analysis, the men are not involved in change regarding this variable. The predicted F2 (aw) values for each sex are shown in Figure 5.2.

![Figure 5.2 Predicted F2 (aw) values with regression lines for age groups for each sex](image)

As the above chart demonstrates, the men do not show a linear relationship with age at all and the regression line (shown as a dotted line) is nearly horizontal. The women do show a more monotonic relationship between age and F2 of (aw).

In order to examine the effects of speaker sex on the variable more closely, the various gender scales developed in this dissertation were introduced individually into the regression model. When sex and sexual orientation are combined as one four-way categorical variable (Sex/SO), this variable has a significant effect at the p < .10 level (p value of 0.0707). The results of this analysis are shown in Table 5.3.
Table 5.3 Multiple regression model of F2 (aw) with age, sex/SO and SEC

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.0437</td>
<td></td>
</tr>
<tr>
<td>Sex/SO</td>
<td>0.0707</td>
<td>0.248</td>
</tr>
<tr>
<td>SEC</td>
<td>0.0652</td>
<td></td>
</tr>
</tbody>
</table>

As shown in the table above, in addition to the significant effect of sex/SO at the p < .10 level, age and SEC are also still significant at the p < .10 level. While the amount of variation explained by this model has decreased slightly from the model with just sex as a variable, the model with sex/SO still can account for 25% of the variation. In addition, since the multiple regression model includes social class, the significant effect of sex/sexual orientation is not skewed by the lack of working class gay and lesbian speakers. Using the predicted values from this model, F2 values for each sex/sexual orientation combination are shown in Figure 5.3 below.

Figure 5.3 Predicted F2 (aw) values by sex/sexual orientation
As the above chart shows, with respect to the direction of the change found in these data, it is the gay men who show the most advanced values. Following behind are the heterosexual men, then the lesbians. Finally, it is the heterosexual women who still show higher F2 values of (aw), and in this case, are lagging the furthest behind in the change.

The above regression model was then sorted by sex/sexual orientation, and due to an interaction of SEC and sex/SO, there are problems with this model and the program cannot calculate least squares means for the gay male data. These issues are resolved when age is transformed into a continuous variable, so the following discussion uses the regression model with age as a continuous variable, SEC and sorted by sex/SO. The results of this analysis are shown in Table 5.4 below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heterosexual Women</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.0060</td>
<td>0.330</td>
</tr>
<tr>
<td>SEC</td>
<td>0.0709</td>
<td></td>
</tr>
<tr>
<td><strong>Heterosexual Men</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.7557</td>
<td>-0.084</td>
</tr>
<tr>
<td>SEC</td>
<td>0.5415</td>
<td></td>
</tr>
<tr>
<td><strong>Lesbian Women</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.0217</td>
<td>0.501</td>
</tr>
<tr>
<td>SEC</td>
<td>0.5688</td>
<td></td>
</tr>
<tr>
<td><strong>Gay Men</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.3335</td>
<td>-0.086</td>
</tr>
<tr>
<td>SEC</td>
<td>0.4751</td>
<td></td>
</tr>
</tbody>
</table>

In accordance with the above discussion regarding the lack of age effects for the male data, neither of the male sexual orientations shows an age effect on the data significant at the p < .10 level. With respect to the female data, both lesbians and heterosexual women show significant age effects on the model (p values of 0.0217 and
0.0060 respectively). Figure 5.4 shows the predicted values for each age group for both female sex/sexual orientations (using age as a categorical variable). As the figure illustrates, both groups of women show a good fit with the linear regression line (shown as a dotted line). With the exception of the oldest age group, the lesbian women show the more advanced forms of F2 of (aw) in terms of the backing change, and at each age group, a sexual orientation differentiation is maintained. This picture is congruent to a picture of language change where sex differentiation is maintained at each age group, with the distance changing depending on the age group.

![Graph showing predicted F2 (aw) values for women for both sexual orientations](image)

*Figure 5.4* Predicted F2 (aw) values for women for both sexual orientations

Another way to look at sex and sexual orientation is the various gender categories developed in this dissertation discussed in the previous chapters. As shown in Table 5.5 below, substituting GI as a categorical variable for sex/SO into the regression model with age as a categorical variable yields a significant effect of GI on the variable at the $p < .10$
level (p value of 0.0286). This model is able to account for 32% of the variation ($r^2 = 0.315$).

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.0502</td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>0.0286</td>
<td>0.315</td>
</tr>
<tr>
<td>SEC</td>
<td>0.0767</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.5 Multiple regression model of F2 (aw) with age, GI and SEC

The predicted F2 (aw) values of the 8 GI scores are displayed in Figure 5.5 below. There is not a simple linear relationship between F2 of (aw) and gender as measured by this scale ranging from most feminine (with a score of 2) to most masculine (with a score of 9). The strongest proponents of the backing of the variable are the speakers who received a GI score of 5 or 8.

![Figure 5.5 Predicted F2 (aw) by GI score](image-url)
If the GI scores are transformed into 3-way gender categories, the gender variable (GCAT) still shows a significant effect on F2 values of (aw) at the p < .10 level (p value of 0.0631), as shown in Table 5.6 below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.0504</td>
<td>0.241</td>
</tr>
<tr>
<td>GCAT</td>
<td>0.0631</td>
<td></td>
</tr>
<tr>
<td>SEC</td>
<td>0.0360</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.6 Multiple regression model of F2 (aw) with age, GCAT and SEC

However, as opposed to the 32% of variation explained by the previous model, the model with the 3-way GI category can only account for 24% of the variation ($r^2 = 0.241$). This indicates that this version of the gender variable may not be as good of a fit for the overall model as the 8 level GI score. Despite this poorer lack of fit with this variable, the predicted F2 (aw) values are shown in Figure 5.6 below for each gender category.

Figure 5.6 Predicted F2 (aw) values by gender category
As the figure illustrates above, the proponents of the retraction of F2 values of (aw) received “neutral” and “masculine” gender labels. This indicates that those speakers coded as “feminine” are the most resistant to this change, or in the least, are not leading this direction of the change. This supports the above discussion regarding the differentiation between lesbians and heterosexual women since most of the lesbians in these data received a “neutral” label and most of the heterosexual women received a “feminine” label.

5.1.1.2 Change in apparent time: (aw): Social Class

The other social factor which shows significant effects in the regression model is social class. As the men’s data do not show a change in progress, only the women will be discussed in terms of social class and its effects on (aw). Figure 5.7 displays the predicted values from a model with age as a categorical variable for each social class for all the women combined and for the two groups of women sorted by sexual orientation. There are no lesbians coded as working class in these data.

Figure 5.7 Predicted F2 (aw) values of social class categories for women
At first glance at the chart above, there is still a curvilinear relationship of social class with the variable. However, it is in the opposite direction of the change. That is, the social classes that are most resistant to the change are in fact the interior social classes. The subtle differences in the working class predicted values for the heterosexual women and all women together is caused by the slight difference in the regression models from sorting the data by just sex alone, versus sex/sexual orientation combined. From this chart, it is clear that the differences of F2 (aw) values for the different sexual orientations only occurs in the lower middle class. The upper middle class shows almost no sexual orientation differentiation. Based on this analysis, in the lower middle class, the lesbians are more advanced in the direction of the change, while it is the heterosexual women who show resistance to the change.

In order to investigate social class further, a regression model of the combined women’s data was constructed with age as a continuous variable and sorted by social class. The regression lines calculated from this model for each class are shown in Figure 5.8 below.
As the figure illustrates, the oldest age groups reflect the curvilinear patterning of social class with the lower middle and upper working classes showing the most extreme values of F2 (if the change were fronting). Based on the LCV data, (aw) was involved in a fronting led by the interior social classes. These data suggest that the change has reversed, which then shows the upper middle class as the strongest proponents of this direction of the change, with the smallest values of F2 (the more back realizations). This would indicate that this reversal is a change from above. The social class patterning in a change from above shows the second highest class (in these data, the lower middle class) outperforming the highest class with respect to the direction of the change. While these data do not show this phenomenon clearly through the regression lines presented above, they do show that the lower middle class and the upper working class with the steepest
slopes, indicating a faster rate of change for these classes toward the leading social class, the upper middle class.

5.1.1.3 CHANGE IN APPARENT TIME: (aw): SUMMARY

The above discussion accounted for the patterns of age, sex, sexual orientation, gender and social class that emerged from the data regarding F2 (aw). Based on these data, a continuation of the fronting of F2 of (aw) as found in the LCV data cannot be supported. Furthermore, men do not show any participation in a change involving this variable. While social class does show significant effects on (aw), the patterning of social class with these data does not resemble findings in other studies. In an attempt to gain a better perspective regarding these patterns, an analysis of the combined data sets of the OMM and the LCV will be conducted next.

5.1.2 CHANGE IN REAL TIME: (aw)

Using the combined data sets of the LCV and OMM, a multiple regression model was constructed for F2 (aw) with age as a continuous variable, and with sex and social class as the other social variables. Although the model only accounts for 22% of the variation ($r^2 = 0.217$), the F value for the overall model is significant at the $p < .0001$, indicating a good fit. This model supports the retraction of F2 of (aw) as the direction of the change, although the effect of age on the model is only significant at the $p < .10$ level ($p$ value of 0.092). In this model, both sex and social class are also significant at the $p < .001$ level ($p$ value of 0.0003 and <0.0001 respectively). When age is transformed into a categorical variable, the significance of the effect of age on the model increases to a $p <
.01 level (p value of 0.0024). This new model can account for 29% of the variation ($r^2 = 0.289$), and sex and social class are still significant at the p < .01 level (both with a p value of 0.0002). Using this categorical age model, the predicted values for each age group are plotted in Figure 5.9.

![Figure 5.9 Predicted F2 (aw) by age group LCV/OMM combined data](image)

The evolution of the change of this variable as shown through real time data is one of advancement in one direction, followed by retraction. According to the chart above, there is a steep increase in F2 values from the 80s generation to the 70s generation. The fronting of (aw) steadily increases through the 40s generation, where it reaches its apex. From this age group and down through the younger generations, the F2 values begin to decrease. While the LCV data show a decrease in F2 values from the oldest age group to the next-to-oldest, these combined data show this shift to be even more extreme. This disruption of a linear progression of this variable through age may be just an anomaly, but it may also be a telling detail about the evolution of language...
change. Instead of progressing steadily through generations, these data suggest that there are periods of time of strong resistance to the direction of the change. As the age span for the data expands beyond 5 or 6 decades, these retrograde moments in time emerge from the data. Therefore, these data may be showing another moment in time for the under-40-year-olds of a resistance to the fronting change, which may be followed by a revived increase in F2 values in the next generations to come. Another interpretation is that if the difference in the oldest two age groups is just an anomaly in the data, then there may be a complete reversal in the direction of change.

5.1.2.1 CHANGE IN REAL TIME: (aw): SEX AND SOCIAL CLASS

While the analysis of the combined data show some unexpected patterns regarding age and the direction of this change, the effects of sex and social class may contribute to the account of the patterns discussed above. After sorting the data by sex, age (categorical variable) still shows a significant effect on the model at p < .10 level for men (p value of 0.0727), and p < .05 level for women (p value of 0.0307). However, while social class is a significant factor in the regression model of the women’s data (p value of 0.0055), it is not in the men’s data (p value of 0.1838). Furthermore, the women’s regression model can account for 26% of the variation (r² = 0.262) while the men’s model can account for only 15% of the variation (r² = 0.153). Figure 5.10 shows the predicted F2 (aw) values for each sex from the combined data.
Figure 5.10 Predicted F2 (aw) by age groups for men and women combined data

By separating the sexes, the intricacies of the evolution of this change begin to emerge. The following discussion of the progression of the change will work from the oldest group backwards through the age groups. First, both sexes show a sharp decline in F2 values from the oldest age group to the next-to-oldest age group. This suggests that this is probably not an anomaly in the data and that there was a community change at this point. This steep decrease in F2 values maintains the sex differentiation present in the oldest age category, supporting a unified community change. Then in the 70s age group, the sharp increase in F2 values by both the men and the women, still maintaining sex differentiation but to a smaller extent than before. Then, the next age group shows an increase in F2 values for women, which plateaus and is maintained through the next two age groups (from the 60s through the 40s). The men, however, show a different pattern. They show a decrease in F2 values for the next two age groups, with an increase picking up again in the 40s. These three age periods show an increase in sex differentiation for
the 60s and 50s groups, and then due to the men’s resurgence in increased F2 values in the 40s group, the sex differentiation is decreased. Then, while the men continue along the path of increasing F2 values, the women show a sharp reversal with a sudden decrease in F2. In the 30s age group, for the first time in these data, the men show higher F2 values than the women. Finally, the picture from these data end with no sex differentiation in the youngest age group, with F2 values less than all the other groups except the 80s group (and the 90+ men). The continuation of the men’s data in the fronting of this change up until the 30-39 age group may be the cause of the insignificant effects of age for men in the OMM data by itself.

As discussed in Chapter 4, the concept of language change and sex differentiation is still supported by these data. It appears that there are moments in time were differentiation of the sexes increases and decreases. It is not clear, however, if the distance between the sexes is the cause behind changes in the evolution of a sound change. That is, did the increase in women’s F2 (aw) values from the 70s age group to the 60s age group stem from a smaller gap of sex differentiation in the 70s age group? Or conversely, perhaps it was the retrograde movement by the men as a reaction to this smaller sex differentiation. Additionally, the sudden decrease in F2 values from the 40s to the 30s groups may have been caused by another moment of smaller sex differentiation in the 40s group. Although it is not clear from these data exactly what causes the dissimilarities in sex differentiation at moments in time, or if shifts in rate or direction of the change are reactions to this distance, what is clear is that sex differentiation is not a constant distance. As stated in Chapter 4, sex differentiation is something that needs to
continually be maintained in the evolution of language change. Just how and why it is maintained is still unclear.

As stated above, the women’s data show a significant effect of social class on the model while the men’s data do not. Using the above model, the predicted F2 (aw) values for the women’s data for each social class are displayed in Figure 5.11 below.

As the above figure illustrates, these data do not reflect a curvilinear pattern where the LMC and the UWC would show the most extreme variants of the variable in the direction of the change. Rather, this retraction change is again shown to be supported by the UMC, closely followed by the LMC. The working classes are either resistant to or lagging behind in this change, with the UWC showing the most resistance.
5.1.2.2 Change in Real Time: (aw): Summary

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. Furthermore, these combined data further illustrate the concepts of sex differentiation as a dynamic effect in the evolution of linguistic change. Finally, these data do not support the curvilinear hypothesis with respect to social class and the direction of this change.

5.2 (eyC): From Movement in F2 to Movement in F1

Along with (aw), the LCV data show that (eyC) is also involved in a change in F2 with a strong age effect on the variable. The current data, however, do not show a significant effect of age on F2 values of (eyC) at the p < .10 level. There is, however, a significant age effect on F1 values of (eyC) in the current data at the p < .001 level. The next sections will examine the social factors involved in the change of vowel height regarding this variable.

5.2.1 Change in Apparent Time: (eyC)

In order to examine the various social factors that may affect F1 values of (eyC), a multiple regression model was constructed, including the following social variables: age (as a continuous variable), sex, and socioeconomic class category (SEC). This model can account for 43% of the variation ($r^2 = 0.432$), and the lack of fit p value is not significant.
at the p < .10 level (p = 0.1446) indicating a good fit of the overall model. In this model, all the social variables show a significant effect at the p < .01 level, as shown in Table 5.7 below.

Table 5.7 Multiple regression model of F1 (eyC) with age, sex and SEC

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>0.0012</td>
<td>0.433</td>
</tr>
<tr>
<td>SEC</td>
<td>0.0004</td>
<td></td>
</tr>
</tbody>
</table>

Transforming the age variable into the categorical version, predicted F1 (eyC) values (least squares means) by age group are plotted in Figure 5.12. This figure illustrates a step-like progression of language change in the raising of this variable.

Figure 5.12 Predicted F1 (eyC) values by age group

5.1.1.1 Change in apparent time: (eyC): Sex, sexual orientation and gender

Since both sex and social class show a significant effect on predicting F1 values of (eyC), it is necessary to investigate each of these factors. First, by sorting the model by sex (with age as a continuous variable), a different picture of language change
regarding this variable emerges. While the women’s data show a significant age effect \( (p = 0.0040) \), they do not show significant effects of SEC at the \( p < .10 \) level \( (p = 0.2454) \). In addition, the women’s data can only account for 27% of the variation \( (r^2 = 0.266) \). This indicates the women are not socially stratified in the current data, yet there is a change in progress. For the men, both age and SEC do show significant effects at the \( p < .10 \) level \( (p = 0.0001 \text{ and } p = 0.0003 \text{ respectively}) \), and 57% of the variation is accounted for \( (r^2 = 0.566) \). This indicates change in apparent time as well as social stratification.

The predicted F1 (eyC) values by age group for each sex are shown in Figure 5.13 below (after transforming age from a continuous to a categorical variable).

![Figure 5.13 Predicted F1 (eyC) values for both sexes by age groups](image)

As the above figure illustrates, the women’s data show a progressive linear change, with a plateau in the youngest two age groups. The men’s data do not show a linear progression, but rather a step-like pattern. In addition, they show a pattern that emerged with (aw) and (ay0). This pattern is change in apparent time with sex differentiation at each step. Again, as shown in the 40-49 age group, sex differentiation
can increase at certain points in time, or decrease at others, as shown in the 30-39 age group. This variable shows another example of sex differentiation maintenance in operation.

In order to examine the effects of speaker sex on the variable more closely, the various gender scales developed in this dissertation were introduced individually into the regression model. When sex and sexual orientation are combined as one four-way categorical variable (Sex/SO), this variable has a significant effect at the p < .10 level (p value of 0.0060), and 43% of the variation is accounted for ($r^2 = 0.434$). Both age (as a continuous variable) and SEC are still significant at the p < .10 level. The results of this model are shown in Table 5.8 below.

As shown by the predicted F1 (eyC) values from this model plotted in Figure 5.14, it is the lesbian women who have the highest variants of this sociolinguistic variable, and are thus leading the change. Heterosexual women produce the next highest variants, followed by their male counterparts, and then by gay men.
Substituting sex/sexual orientation for GI score as an 8-level categorical variable, the GI score does show a significant effect on the F1 (eyC) values at the $p < .05$ level ($p$ value of 0.0157). This model can account for 45% of the variation, and age and SEC are still significant factors at the $p < .01$ level. These results are shown in Table 5.9 below.

**Table 5.9** Multiple regression model of F1 (eyC) with age, GI and SEC

<table>
<thead>
<tr>
<th>Variable</th>
<th>$p$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;.0001</td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>0.0157</td>
<td>0.446</td>
</tr>
<tr>
<td>SEC</td>
<td>0.0005</td>
<td></td>
</tr>
</tbody>
</table>

The predicted F1 (eyC) values from this model for each GI score are shown in Figure 5.15 below.
As the figure illustrates, the strongest proponents of the raising of (eyC) received a GI score of 6 and were thus labeled as neither feminine nor masculine. The gender variable was transformed into the 3-way gender category variable and the model was recalculated. In this model, the gender variable (GCAT) still shows a significant effect on the F1 (eyC) values at the p < .05 level (p value of 0.0173). This model can account for 40% of the variation ($r^2 = 0.399$), and age and SEC are still significant at the p < .10 level (p <.0001 and p = 0.0031 respectively). Grouping the above GI scores into these three gender categories, the predicted F1 (eyC) values are displayed in Figure 5.16.
As the regression model indicates, gender category is a significant factor in predicting F1 values of (eyC). The above figure shows that it is not the most feminine or masculine speakers who are the strongest proponents of this change. Similar to the curvilinear hypothesis, this analysis suggests that it is the speakers located in the interior of a masculine/feminine continuum who are leading this change.

As many of the lesbians received a GI score of 6 and were labeled as neutral on the gender categorical scale, all of these three pictures relating to gender and sexual orientation point to lesbians at the forefront of this change.

5.2.1.2 Change in apparent time: (eyC): Social class

As discussed above, the multiple regression model shows social class (SEC) to have a significant effect on the F1 (eyC) values. While SEC is not significant for the women’s data, it is for the men. However, in the model with both sexes combined (see
Table 5.6 above), SEC has a significant effect at the $p < .001$ level ($p$ value of 0.0004).

The social stratification for predicted F1 (eyC) values from this model with both sexes combined is shown in Figure 5.17 below.

![Figure 5.17 Predicted F1 (eyC) values by SEC category for both sexes combined](image)

The direction of the change identified in the current data is a raising of the nucleus of (eyC), indicated by a lower F1 value. As the figure above shows, this variable does not reflect a curvilinear model of linguistic change from below. In fact, the above social stratification indicates that there is a linear relationship with the height of (eyC) and social class. That is, the higher the social class of a speaker, the higher values of (eyC) he/she produces. This indicates a change from above, being led by the upper middle class, and being followed by the subsequent lower classes, each class showing higher F1 (eyC) variants than the class below them.

When the data are sorted by sex, however, a different picture emerges. As shown in Figure 5.18, and as discussed above, the women’s data do not show significant effects
of SEC with little social stratification for F1 (eyC). The men, however, do show the same pattern discussed above for both sexes combined. That is, there is a linear relationship with F1 values of (eyC) and SEC. With respect to sexual differentiation, it is in the leading social class, the upper middle class, where there is the smallest amount of sexual differentiation. The other classes maintain differentiation between the sexes, with the gap widening as you progress down through the social class ladder.

![Graph showing predicted F1 values by SEC category sorted by sex](image)

*Figure 5.18 Predicted F1 (eyC) values by SEC category sorted by sex*

As indicated above, the significant effect of the sex/sexual orientation combined variable on the data lead to the conclusion that lesbian women are in the lead of this change. In order to identify any social stratification with respect to the 4-way sex/sexual orientation variable, the model was sorted by this variable and the predicted F1 (eyC) values for each sex/sexual orientation for each SEC are shown in Figure 5.19. In this model, SEC does not show significant effects at the p < .10 level for either the heterosexual women (p = 0.5785) or the lesbian women (p = 0.4242). SEC is a
significant factor for both the gay men (p = 0.0646) and the heterosexual men (p = 0.0017). This indicates that there is social stratification in both groups of men’s data, but in neither of the women’s.

Figure 5.19 Predicted F1 (eyC) values by sex/sexual orientation for each SEC

As noted above, there are no gay men or lesbians who were coded as working class in these data. The middle classes, however, show lesbians with the highest predicted values of F1 (eyC) (in terms of vowel height), and gay men with the lowest. In the regression model, however, age does not have a significant effect on predicting F1 values of (eyC) for the lesbian data (p = 0.4773). This indicates that lesbians, although with the highest variants in the speech community, are not involved in change in apparent time. With age still significant for the other 3 sex/sexual orientation groups, it appears that the other groups are catching up to the lesbians, for whom the change appears to be completed.
5.2.1.3 Change in Apparent Time: (eyC): Summary

The data of OMM show that there is a significant age effect on the F1 values of (eyC). While both sexes are implicated in change in apparent time, only the men show significant social stratification. From the men’s data, it is the upper middle class leading the change for them, indicating a change from above. Examining other aspects of gender, lesbian women show the highest F1 (eyC) (in terms of vowel height), but are not implicated in language change with no significant effects of age for them. The other three sex/sexual orientation groups show change in apparent time, but only the male groups show social stratification. Finally, it is the gay men who show the lowest F1 (eyC) (in terms of vowel height), and are the most resistant to this change.

5.2.2 Change in Real Time: (eyC)

Using the combined data sets of the LCV and OMM, a multiple regression model was constructed for F1 (eyC) with age as a continuous variable, and with sex and social class as other social variables. The model only accounts for 18% of the variation ($r^2 = 0.178$), but the F value for the overall model is significant at the $p < .0001$, indicating a good fit. However, unlike the model from the OMM data by itself, only age shows a significant effect at the $p < .10$ level ($p < .0001$), while SEC and sex do not ($p = 0.1492$ and $p = 0.6515$ respectively). When age is transformed into a categorical variable, the $r^2$ increases to 0.198 (accounting for 20% of the variation). However, age is still the only significant social factor at $p < .10$ level ($p < .0001$). The predicted F1 (eyC) values by age group are shown in Figure 5.20 below.
The picture of language change painted with this sociolinguistic variable is a change by generation (about 20 years). At each twenty year increment, there is a decrease in F1 (eyC) values (indicating raising of the vowel), followed by a slight increase in F1 (indicating lowering of the vowel). The slight reversal every 20 years (indicated by the dotted circles in the above figure), is not equal to the amount of raising that occurs every other 20 years (indicated by the boxes). This back and forth phenomenon still allows the raising of the vowel to progress.

5.2.2.1 Change in real time: (eyC): Sex and social class

Although neither sex nor social class shows significant effects on the linguistic variable, the data were sorted to see if there were any hidden details in the analysis. When the data are sorted by sex, neither men nor women show social stratification at a
significant level of \( p < .10 \) (\( p = 0.2218 \) and \( p = 0.8759 \) respectively). The predicted F1 (eyC) values for each age group and sorted by sex are shown in Figure 5.21.

![Figure 5.21 Predicted F1 (eyC) for age groups by sex](image)

With the exception of the oldest age group, the men and women’s data are almost identical. As the regression model indicates, the differences between the sexes are not significant at the \( p < .10 \) level. Unlike the other linguistic variables discussed so far, the raising of (eyC) does not show sex differentiation at all. Contrary to most linguistics changes from below, F1 (eyC) in these data sets show that neither sex is leading the other, but rather there is a unified community change. Although the status of this variable regarding the level of consciousness (i.e., change from above vs. change from below) still needs to be verified, the data indicate that language change can in fact occur without sex differentiation at any stage. In addition, either in a model with both sexes combined or separated, SEC is not a significant factor on predicting F1 (eyC) values. This indicates that not only does the raising of (eyC) show no sex differentiation, but it
also shows no social stratification. This change, therefore, seems to be operating as a unified community effort. This lack of sex differentiation and social stratification is different from the findings from the OMM data by itself. This discrepancy may be due to a leveling out of sex and SEC effects with the addition of more data.

5.2.2.2 Change in Real Time: (eyC): Movements in F2

Although the data in the current study do not show significant age effects on the F2 values of (eyC), the combined data set does. When OMM and LCV data are combined, using a model with F2 (eyC) with age (as a categorical variable), sex, and SEC, age shows a significant effect at the p < .001 level (p = 0.0009). While SEC does not show a significant effect (p = 0.1499), sex does at the p < .0001 level. Figure 5.22 shows the predicted F2 (eyC) values for each age group from both OMM and LCV data.

![Figure 5.22 Predicted F2 (eyC) values by age group for OMM and LCV data](image)
As the above chart illustrates, there is a fronting of (eyC) apparent in the data sets. Again, similar to the combined data for (aw), from the oldest age group to the next-to-oldest, there is a sharp reversal of the direction of the change, only to be picked back up by the subsequent younger age groups. One of the reasons this aspect of the change was not identified from the OMM data is due to the slowing or near completion of this change, as is evident in the above figure. That is, the values for the four age groups under 60 do not show a steady increase like the age groups over 60.

The regression model constructed from both OMM and LCV data sets indicates that sex does show a significant effect on the model, as discussed above. With this information, it is possible to predict that this significant sex difference would lead to a language change picture with sex differentiation at each age group. This is, in fact, what emerges from the data, as shown in Figure 5.23 below.

*Figure 5.23* Predicted F2 (eyC) by age group by sex for both OMM and LCV data
Both sexes show a similar patter along the progression of this change, with maintained sex differentiation at each age group. As suggested in the previous discussion, this differentiation is not equal for each age group, and has narrowed for the speakers in the youngest three age groups. However, unlike the F1 dimension of (eyC), sex differentiation is maintained at even the youngest age groups. This situation leads to a theoretical question of whether vocalic linguistic variables show sex differentiation regardless of if they are involved in change or not. According to Labov (2001) and Eckert (1999), the older changes continue to show sex differentiation, while the newer the change, the less differentiation exists. This finding is supported by these data, at least for F2 (eyC). Since neither men nor women show a significant effect of SEC on the model (p = 0.2094 and p = 0.3183 respectively), this social factor will not be investigated further.

5.2.2.3 CHANGE IN REAL TIME: (eyC): SUMMARY

The above discussion regarding the real time change of (eyC) shows both movements in F1 and F2. Along the F1 dimension, the combined LCV and OMM data set show generational changes of twenty years in the raising of the vowel, with slight retrograde movements every other ten year age group. In addition, the data do not show any social stratification or sex differentiation for this dimension of (eyC). Along the F2 dimension, and contrary to the OMM data by itself, the combined data show a fronting change in real time of (eyC), supporting the apparent time analysis of the LCV data by itself (Labov, 2001). Unlike the F1 dimension, however, the F2 dimension does maintain sex differentiation at each group. The data also show that in the youngest four age
groups, this change has slowed and may be completed. Unlike the LCV data by itself, the F2 dimension in the combined data does not show social stratification. This may be due to the near completion of the change for this variable. Combining both F1 and F2 dimensions, these data suggest that while the vowel may have reached its most peripheral point with respect to F2 for speakers under 60, the raising along the F1 dimension is still progressing.

5.3 CHAPTER 5 SUMMARY

According to the above discussion, the pictures of the new and vigorous changes identified in the LCV data are different in the current study. The fronting of (aw) has reversed, and the picture of the combined data sets supports that analysis. There is a plateau for middle aged speakers, where the vowel appears to have hit its apex in F2 peripherality. In the OMM data, however, men are not participating in the backing of (aw) change, although the women are. With respect to the women’s data, it is the lesbian women as opposed to the heterosexual women who are leading the change. The picture of differences in sexual orientation for the women looks similar to other pictures of language change of sex differentiation between men and women. At each age group, lesbians were ahead of their heterosexual counterparts in this direction of the change. Finally, with respect to social class, only women in the OMM data show social stratification. The curvilinear pattern does appear, but in the direction of the fronting of this change. That is, the classes with the lowest F2 (aw) values are the exterior social classes, with the upper middle class in the lead with the lowest F2 (aw) values. This indicates a change from the upper middle class. The upper middle class lead in the
retraction direction of the change is supported in the combined data set, showing the lower middle class following the upper middle class, with the working classes even further behind in this direction of the change. From all of these different perspectives, it appears that the fronting of (aw) reached its climax and there is a strong retraction from the middle classes.

The other new and vigorous change (eyC) does not show change in apparent time on the F2 dimension in the OMM data. Along the F1 dimension, however, there are significant age, sex and SEC effects. Only the men, however, show social stratification, with a linear relationship of class and the height of (eyC): the higher the vowel, the higher the social class. Finally, the women’s data show significant effects of sexual orientation, while the men’s do not. Similar to the findings from (aw), lesbian women are leading their heterosexual counterparts in this change as well. This finding is supported by the neutral gender category leading the change, as opposed to feminine or masculine.

From the combined date, however, a different picture emerges. There is still a change of F1 (eyC), but there is no sex differentiation or social stratification. Another difference from the OMM data by itself and the combined LCV and OMM data is that F2 (eyC) does show significant age effects, indicating change in real time. The data suggest a slowing or completion of this change for speakers under 60, as well as sexual differentiation maintained at each age group. The F2 dimension of (eyC), however, shows no social stratification.

While these two variables show different patterns from those predicted by the LCV data analysis (Labov, 2001), they continue to support some theoretical issues in language change. Neither of these variables, in real or apparent time analyses, support
the curvilinear hypothesis of social stratification for changes in progress. They do support concepts of sex differentiation, with women leading changes, for the most part. In addition to these premises, a new pattern showing lesbian women on the forefront of language change has emerged. These implications will be discussed further in Chapter 7.
6.0 INTRODUCTION

While vowel production is the primary focus of this project, the evaluation of those productions by speakers of the variety gives a more detailed picture of the entire situation. In order to gain this insight from the speech community, a subjective reaction test (SRT) was constructed and carried out as part of the interview. This chapter outlines the methodology used to construct the instrument, as well as the analysis and discussion of the results.

6.1 CREATION AND ADMINISTRATION OF THE SRT

While the SRT used in the current study was modeled after the one conducted in the 1970s as part of the LCV, there were some modifications to the original design. The first of these changes was the range of variables examined. With the focus of this dissertation on (ay0) and (aw), only these two variables were investigated as part of the SRT. In order to examine the subjects’ evaluations of the linguistic variables in question, sentences were constructed which contained multiple examples of a particular variable. The current study utilized the same sentences used in the LCV. Table 6.1 shows the 6 sentences used in the SRT of the current study.
### Table 6.1 SRT sentences by variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sentence</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>It was a lot different from what we expected.</td>
<td>Diff</td>
</tr>
<tr>
<td>Neutral</td>
<td>We bought some equipment a couple weeks before we left.</td>
<td>Equip</td>
</tr>
<tr>
<td>(ay0)</td>
<td>It was quite a fight, trying to put in the two big pipes, but we finally did it.</td>
<td>Fight</td>
</tr>
<tr>
<td>(ay0)</td>
<td>It was a fine sight; we got a bite to eat and got to sleep by nine.</td>
<td>Sight</td>
</tr>
<tr>
<td>(aw)</td>
<td>We scouted around for wood, and found some without much trouble.</td>
<td>Scout</td>
</tr>
<tr>
<td>(aw)</td>
<td>We took down the tent and set out toward a mountain about two hours south of us.</td>
<td>Mount</td>
</tr>
</tbody>
</table>

As shown above, there are a total of six sentences which compose the SRT. The two neutral sentences were included to compare evaluations of the same speaker using specific linguistic variables versus a relatively neutral sentence with respect to any variables involved in change. By using these neutral sentences, any evaluations made about a speaker regarding voice quality or reading ability would be accounted for. Therefore, a difference in evaluation between the neutral sentences and the non-neutral ones would reflect a difference in evaluation of the linguistic variables. This practice was also adopted in the LCV (Labov, 2001).

The speakers of the SRT in the LCV were chosen to represent the range of variants of the linguistic variables, from conservative to extreme. However, because there were in fact four different speakers, differences in evaluation across speakers could be due to differences in evaluation of the speakers’ voices or reading ability, or other non-linguistic factors, and would not clearly demonstrate a difference in evaluation of the variables themselves. In addition, all the speakers were female, so no differences or similarities in evaluations based on the sex of the speaker could be investigated. In order to account for these shortcomings, the current study devised a co-ed matched guise test as
part of the SRT. There were a total of 6 guises that subjects rated, but only 4 speakers.

One man and one woman performed two guises each, and one other man and woman were included as fillers to try to distract the subjects from recognizing that some speakers were in fact the same person.

All speakers were native Philadelphians with moderate Philadelphian vowel systems. Regarding the matched guise speakers, both the woman (Jill), aged 24, and the man (Ben), aged 43, could be classified as middle class. In addition, both had enough linguistic training to be able to practice and produce more and less extreme variants of the variables in question. They were recorded saying all six of the sentences multiple times, and the final sentences used for the SRT were composites of these different utterances. Due to naturally occurring pauses in each sentence, the final sentence was spliced together from pieces of other utterances to form one natural sounding sentence. In order to decide which sentence pieces contained the best native-like variants, both speakers were recorded reading a reading passage and word list. From these data, their speech was digitized and segmented, and single point vowel measurements were taken for each token following the methodology described in Chapter 3. Their entire vowel systems were normalized and plotted in Plotnik. Finally, mean values were calculated for each vowel class and plotted. Figure 6.1 represents the mean normalized values for the relevant vowel classes of Jill’s system, while Figure 6.2 illustrates Ben’s system. As discussed in Chapter 4, the vowel classes /ohr/ and /owr/ have been merged into one mean /or/, and the vowel class as in the word girl is identified as /*hr/. In addition to the mean values for each word class, the grand means for each speaker’s entire system have been drawn in light grey, with the intersection of the horizontal and vertical lines
representing the center of the speaker’s system.

Figure 6.1 Jill, 24, Northeast Philadelphia, PA vowel means

As shown in Jill’s system above, there are moderate Philadelphia features, such as the split of /æ/ and /æh/, a mid front realization of /aw/, and a split between the checked and free allophones of /ey/. In addition, Jill’s system shows fronting of both /uw/ and /ow/, except before /l/. She shows a raised /ay0/ from /ay/, and high back realizations of /oy/, /uw/ and /or/.
Figure 6.2 Ben, 43, Abington, PA vowel means

As shown in Ben’s system above, there are moderate male Philadelphia features, such as a split of /æ/ and /æh/, and a split between the checked and free allophones of /ey/. His /eyC/ mean is not realized as high front as Jill’s and his /aw/ is still in a conservative low-front position. In addition, Ben’s system shows moderate fronting of both /uw/ and /ow/, except before /l/. He shows a raised /ay0/ from /ay/, and high back realizations of /oy/, /uw/ and /or/.

Using these systems based on the data from the reading passage and the word list, all of the focus variants in all of the instances of the SRT sentences they read were plotted onto their entire system. Variants existing outside of their normal system were eliminated. The remaining variants were then evaluated for inclusion.
The best (aw) variants included a mid to low front vowel as the conservative variant, and a mid to high front vowel as the extreme variant. In addition to the position of the nucleus of this variable, the glide targets were also plotted. Following the discussion of variants used in the SRT of the LCV, the more conservative variants were composed of a low front nucleus with a mid back rounded glide \([æo]\), while the more extreme variants were composed of a mid front nucleus with a lower mid back rounded vowel \([ɛc]\). The sentence pieces meeting all these requirements while still existing within the speaker’s system were chosen as the final sentence. Figure 6.3 shows Jill’s entire vowel system from above, with the addition of the nuclei of the extreme SRT (aw) tokens in italics and represented with solid triangles, and the nuclei of the moderate SRT (aw) tokens underlined and represented by the open triangles.

*Figure 6.3* Jill’s mean system with SRT /aw/ tokens for both guises
As the above figure illustrates, the tokens chosen as more extreme were the ones
with the more peripheral nuclei. The glide targets for the variants were also measured
and plotted. Figure 6.4 shows the trajectory of the diphthongs of all of the SRT (aw)
tokens, with the extreme variants as solid lines and the moderate variants as dashed lines.

![Figure 6.4](image_url) Jill’s mean system with SRT /aw/ tokens and glide trajectories for both guises

For the most part, the SRT tokens show movement toward a low-back direction.
The major difference between the extreme and the moderate tokens is in the peripherality
of both the nucleus and the glide target (represented above by the heads of the arrows).

Following the same methodology, extreme and conservative tokens in Ben’s
system were selected. Figure 6.5 represents his entire vowel system from above, with the
addition of the extreme SRT tokens in italics and represented with solid triangles, and the conservative SRT tokens underlined and represented by the open triangles.

Figure 6.5 Ben’s mean system with SRT /aw/ tokens for both guises

Following the methodology applied to Jill’s data, the more peripheral nuclei in Ben’s system were selected as the extreme tokens, while the moderate tokens were selected from the lower and less peripheral nuclei. Figure 6.6 shows the addition of the (aw) glide trajectories for Ben’s data.
While some of the moderate tokens show a higher glide target than nucleus, most of the SRT tokens show movement toward a low-back direction. Again, the major difference between the extreme and the moderate tokens is in the peripherality of both the nucleus and the glide target (represented above by the heads of the arrows).

The same process was followed in the construction of the sentences containing the other variable, (ay0). While the raising of the nucleus of this diphthong is one of the movements involved in change, there is a secondary front-back distinction as well. In order to investigate if backing of the nucleus of this diphthong was evaluated differently, the two guises were based more on differences regarding this dimension. Therefore, the more extreme variants were produced with a mid back nucleus, while the more conservative variants were produced with a mid central nucleus. For both speakers, the
extreme Philly guise included tokens that were more raised and backed with respect to this variable. Figures 6.7 and 6.8 demonstrate these different variants on top of the speaker’s entire vowel system.

*Figure 6.7* Jill’s mean system with SRT /ay0/ tokens for both guises
Once the final sentences were constructed, each sentence was copied resulting in two instances of exactly the same sentence. The 36 utterances were then organized randomly, alternating by sex. Special attention was given not to play the same sentence by both guises too close together. The filler speakers essentially served as buffers between guises.

The final change made to the original SRT from the LCV was regarding the number of evaluative scales. While the LCV SRT contained only two, the SRT for the current study consisted of 4 scales, shown in Table 6.2 below.

*Figure 6.8* Ben’s mean system with SRT /ay0/ tokens for both guises
Table 6.2 SRT scales

<table>
<thead>
<tr>
<th>Job suitability</th>
<th>Toughness</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the highest job this person could hold, speaking as (s)he does?</td>
<td>If this speaker got into a fight, how likely is it that (s)he would win?</td>
</tr>
<tr>
<td>No job at all</td>
<td>Not at all likely</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
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<tr>
<td>5</td>
<td>5</td>
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<tr>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Television Personality</td>
<td>Very likely</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Masculinity/Femininity</th>
<th>Friendliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>How masculine or feminine do you think this speaker is, speaking as (s)he does? (4 = Average/Typical)</td>
<td>If you got to know this speaker well, how likely is it that (s)he would become a good friend of yours?</td>
</tr>
<tr>
<td>Very Feminine</td>
<td>No at all likely</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
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<tr>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Very Masculine</td>
<td>Very likely</td>
</tr>
</tbody>
</table>

In addition to the job suitability and friendliness scales taken from the SRT administered by the LCV, a scale evaluating toughness and a scale to indicate the masculinity or femininity of the speaker was included. The Masculinity/Femininity scale (Masc/Fem) works differently than the other scales in that the midpoint (4) is considered average or typical for the sex of the speaker.

Finally, this 36-sentence, 4-scale SRT was administered to most subjects of the current study. Due to time constraints or other reasons, the SRT was not administered to some subjects. However, the data gained from the SRT are from a total of 59 subjects. Three of these subjects were not included in the vowel production analysis, due to reasons previously discussed, but they were included in the SRT portion of the study. Furthermore, two subjects only evaluated the male data due to their familiarity with one of the female speakers. The subjects were told that they would hear 3 men and 3 women reading 6 different sentences from a story about camping. They were asked to rate each speaker for each sentence as they heard it, and that each sentence would be play a total of
two times in a row. The scales were explained to the subjects to avoid any confusion. While this quickly became a monotonous task for the subjects, they did not refuse to continue once they had begun. Two subjects were asked to only evaluate the male voices as they were acquainted with one of the female speakers of the SRT. During the administration of the test, some subjects suggested that they heard the same person over and over. However, when questioned further, they never suggested that there were only two men and two women, but rather they had misunderstood that they would be hearing the same six speakers reading six sentences. Also, no evaluator indicated that any of the speakers sounded unnatural in any way.

6.2 **Analysis of the SRT Data**

There are a number of ways to approach these data from the SRT. The first set of analyses looks at the data from all of the evaluators to see if patterns from the matched guise aspect are revealed from the entire speech community. Following the analysis of the LCV SRT in Labov, 2001, the second section examines the difference for each speaker/guise from the neutral sentence ratings to the ratings of each variable. Finally, the third section uses a series of differences in each evaluator’s ratings to uncover any social variables which may affect the ratings.

6.2.1 **All Evaluators Matched Guise Evaluations**

The first step in investigating a possible different evaluation of the guises is to find out if all the evaluators agreed on any particular aspect. For each guise, a mean score was calculated for each sentence for each scale. Then, the mean scores of both
sentences of each linguistic variable were grouped and average ratings for each linguistic variable for each scale were calculated. Using t-tests, the mean scores for each guise/scale were investigated to see if the difference between the mean scores of the two guises reached statistical significance. Since there was no predicted direction of difference in the scores, and due to different standard deviations, a 2-tailed, unequal variance t-test was conducted. Table 6.3 displays the mean scores for all variables for both the extreme Philadelphia guises (Jill2 and Ben2) and the moderate counterparts (Jill and Ben). The higher of the two scores is shaded grey, and if the score is identical for both guises, then both cells of the table are shaded grey. The results from the t-tests that show a statistical significant difference at the p < .10 level are in italics, and at the p < .01 level are in bold. For the remainder of this chapter, only analyses that reach a statistical significance at the p < .01 level will be considered significant.

<table>
<thead>
<tr>
<th>Scale:</th>
<th>Job</th>
<th>Friend</th>
<th>Tough</th>
<th>M/F</th>
<th>Scale:</th>
<th>Job</th>
<th>Friend</th>
<th>Tough</th>
<th>M/F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jill</td>
<td>4.3</td>
<td>4.0</td>
<td>2.9</td>
<td>2.8</td>
<td>Ben</td>
<td>4.9</td>
<td>3.8</td>
<td>4.1</td>
<td>4.8</td>
</tr>
<tr>
<td>Jill2</td>
<td>4.0</td>
<td>3.8</td>
<td>2.9</td>
<td>2.7</td>
<td>Ben2</td>
<td>4.8</td>
<td>3.8</td>
<td>4.6</td>
<td>5.1</td>
</tr>
<tr>
<td>p</td>
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<td>0.4148</td>
<td>0.8444</td>
<td>0.4977</td>
<td>p</td>
<td>0.8488</td>
<td>0.9349</td>
<td>0.0108</td>
<td>0.2027</td>
</tr>
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<td>(ay0)</td>
<td>(ay0)</td>
<td>(ay0)</td>
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<td>(ay0)</td>
<td>(ay0)</td>
<td>(ay0)</td>
<td>(ay0)</td>
</tr>
<tr>
<td>Jill</td>
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<td>3.9</td>
<td>2.7</td>
<td>2.6</td>
<td>Ben</td>
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<td>3.9</td>
<td>4.1</td>
<td>4.8</td>
</tr>
<tr>
<td>Jill2</td>
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<td>3.4</td>
<td>2.3</td>
<td>2.6</td>
<td>Ben2</td>
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<tr>
<td>p</td>
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<td>0.9348</td>
<td>0.0031</td>
<td>0.0004</td>
</tr>
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<td>Ø</td>
<td>Ø</td>
<td>Var:</td>
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<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
</tr>
<tr>
<td>Jill</td>
<td>4.4</td>
<td>3.9</td>
<td>2.8</td>
<td>2.6</td>
<td>Ben</td>
<td>4.9</td>
<td>3.7</td>
<td>4.7</td>
<td>5.6</td>
</tr>
<tr>
<td>Jill2</td>
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<td>4.3</td>
<td>2.5</td>
<td>2.5</td>
<td>Ben2</td>
<td>4.5</td>
<td>3.8</td>
<td>4.5</td>
<td>5.1</td>
</tr>
<tr>
<td>p</td>
<td>0.4327</td>
<td>0.1168</td>
<td>0.0893</td>
<td>0.6298</td>
<td>p</td>
<td>0.0075</td>
<td>0.8086</td>
<td>0.2449</td>
<td>0.0082</td>
</tr>
</tbody>
</table>
6.2.1.1 All Evaluators Matched Guise Evaluations of the Neutral Sentences

According to Table 6.3 above, no scales show a significant difference for Jill’s guises, whereas two do for Ben’s guises. A visual representation of these data is shown in Figure 6.9 below, with the significant differences in a box. In the Job and the Masculine/Feminine (M/F) scales, Ben’s guises do show a significant difference in evaluation. These results may be due to a difference in production of other possible sociolinguistic variables in the “neutral” sentences. One possibility is that the speaker produced two instances of each sentence, and regarding the Equipment sentence, used a more extreme (higher and more back) variant of the vowel in the word *bought* in one sentence. These differences in these sentences, therefore, may not be truly “neutral” according to the evaluators.

![Variable: (Ø)](image)

*Figure 6.9 SRT neutral sentences’ ratings by guise by scale*
6.2.1.2 ALL EVALUATORS MATCHED GUISE EVALUATIONS OF (aw)

Turning to (aw), as the table above illustrates, there is no significant difference between guises for any scale for either speaker. These data are represented in Figure 6.10 below. While the Tough scale shows a difference in Ben’s guises significant at the $p < .05$ level (circled in the figure), this will not be further discussed.

![Figure 6.10 SRT (aw) ratings by guise by scale](image)

6.2.1.3 ALL EVALUATORS MATCHED GUISE EVALUATIONS OF (ay0)

While there are not any significant guise differences for (aw), there are three scales for (ay0) that show a significant difference in the evaluation of the two guises. As shown in Figure 6.11 below, there are significant guise differences for Ben in the Tough and M/F scales, and significant guise differences for Jill in the Job scale. Again, the significant differences at the $p < .01$ level are shown in boxes.
As the above figure shows, the more extreme variants of (ay0) for the male speaker is evaluated as tougher and more masculine. The evaluators decidedly did not rate the female variants as more or less feminine, represented by the identical ratings for both female guises. Finally, the ratings suggest that the more moderate variants for Jill are scored higher in the Job scale. As the Job scale is designed to measure overt prestige (what the evaluators believe to be more correct or standard), the extreme (ay0) variants for the female speaker are downgraded and the moderate variants are shown to have more overt prestige. This is not found to be the case for the male speaker.

6.2.1.4 ALL EVALUATORS: INTRASPEAKER COMPARISONS

While the above shows how the entire community evaluated the variables through the matched guise perspective, this section will demonstrate another way to look at
evaluations of the linguistic variables, which was adopted by the LCV analysis (Labov, 2001). Following this line of analysis, by looking at the differences of the ratings of a given scale for a given speaker between the neutral sentence and the sentence with the linguistic variable, we can gain insight into the evaluator’s reaction to the linguistic variable holding their evaluations of the speaker constant. Similar to the matched guise aspect, this analysis attempts to isolate the evaluator’s reaction to the linguistic variable from his/her reaction to the speaker. Using $t$-tests, the mean scores for each guise/scale of the neutral sentences were compared to the comparable mean scores of both sociolinguistic variables to see if the difference between them reached statistical significance. Since there was no predicted direction of difference in the scores, and due to different standard deviations, 2-tailed, unequal variance $t$-tests were conducted. The p values from these $t$-tests and the mean rating for each guise/scale is shown in Table 6.4 below. Note that the same 4 neutral mean scores for each guise are repeated in order to compare the neutral scores for each scale to both variables.
Table 6.4 Intraspeaker SRT mean scores for all evaluators with p values from t-tests

<table>
<thead>
<tr>
<th>Scale:</th>
<th>Job</th>
<th>Friend</th>
<th>Tough</th>
<th>M/F</th>
<th>Job</th>
<th>Friend</th>
<th>Tough</th>
<th>M/F</th>
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<td>(ay0)</td>
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<td>3.9</td>
<td>2.7</td>
<td>2.6</td>
</tr>
<tr>
<td>JLØ</td>
<td>4.4</td>
<td>3.9</td>
<td>2.8</td>
<td>2.6</td>
<td>4.4</td>
<td>3.9</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td>p</td>
<td>0.6164</td>
<td>0.6354</td>
<td>0.4840</td>
<td>0.3078</td>
<td>0.2660</td>
<td>0.9693</td>
<td>0.6076</td>
<td>0.8872</td>
</tr>
<tr>
<td>JL2</td>
<td>4.0</td>
<td>3.8</td>
<td>2.9</td>
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<td>3.4</td>
<td>2.3</td>
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</tr>
<tr>
<td>JL2Ø</td>
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<td>2.5</td>
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<td>4.3</td>
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</tr>
<tr>
<td>p</td>
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<td>BM2Ø</td>
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<tr>
<td>p</td>
<td>0.0639</td>
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<td>0.0151</td>
<td>0.4168</td>
<td>0.2335</td>
<td>0.0285</td>
</tr>
</tbody>
</table>

Although no clear pattern emerges from the data regarding the matched guise analysis of (aw) discussed above, the intraspeaker comparisons offer a little more insight into the evaluation of this variable by the unified speech community. First, as shown in Figure 6.12 below, there are two significant differences between the neutral sentences and the sentences containing (aw) for the moderate Ben guise. The Tough scale indicates that the moderate variants of (aw) are rated as less tough than the neutral context. The M/F scale indicates that while the speaker was rated as more masculine than average in the neutral sentences (5.6), the moderate (aw) forms received a rating more towards average for a man. This suggests that the moderate variants of (aw) are rated as less masculine than neutral.
Turning to Jill’s data (Figure 6.13), there are not any significant differences between the evaluations of the neutral sentences and the evaluations of the sentences with (aw) for either guise.

*Figure 6.12 Neutral and (aw) intraspeaker comparisons for Ben’s guises*

*Figure 6.13 Neutral and (aw) intraspeaker comparisons for Jill’s guises*
Similar to the matched guise comparisons, there are more significant differences for (ay0) than for (aw) in the intraspeaker comparisons. As shown in Figure 6.14 below, there are 2 significant differences the moderate guise, but none for the extreme Philly guise. In the Tough scale, the moderate guise was rated tougher in the neutral sentences than in the (ay0) sentences. This indicates that the moderate (ay0) variants are evaluated as less tough than neutral. Similarly, in the M/F scale, the moderate variants of (ay0) are rated as less masculine than neutral.

**Figure 6.14** Neutral and (ay0) intraspeaker comparisons for Ben’s guises

The evaluations of (ay0) in the female speaker/guises, however, do not show significant differences from neutral in the Tough and M/F scales, as shown in Figure 6.15 below. In addition, none of the scales show significant differences for intraspeaker comparisons of the moderate female guise. The extreme female guise, however, does
show significant differences in the Job and Friend scales. In both scales, (ay0) in this guise was downgraded from the neutral speech, indicating that the extreme (ay0) variants are evaluated lower on both the Friend and Job scales. Again, following the discussion of the LCV SRT data (Labov, 2001), the Job scale roughly estimates an overt standard of speech, while the Friend scale roughly represents any covert prestige that may be present for a particular linguistic variable. This lends further support that for female speakers, extreme (ay0) variants have neither overt nor covert prestige.

![Figure 6.15](image)

*Figure 6.15 Neutral and (ay0) intraspeaker comparisons for Jill’s guises*

### 6.2.1.5 All Evaluators’ Evaluations Summary

According to Labov, 2001, the entire speech community shares the same evaluations of variables regardless of their usage, and these evaluations are caught up in a battle between covert and overt norms. The data gathered from the current study,
however, do not show clear evaluations by the entire community regarding (aw). With minimal significant differences found in the intraspeaker comparisons, and none in the matched guise contrasts, this variable shows little evaluation at all. The only pattern that emerges is that the moderate (aw) variants for men are evaluated as less tough than neutral. Regarding (ay0), these data suggest that the entire community does show some consistency in the evaluations of the variants. However, there is not consistency in the evaluation of both sexes regarding this variable, indicating that men and women may not be subjected to the same evaluations of even the same linguistic variable. For the male data, there is no information regarding the overt/covert prestige with this variable as measured through the Friend and Job scale. However, both sets of contrasts do show similar patterns regarding evaluations of (ay0) for male speakers in the Tough and M/F scales. The matched guise indicates that the more extreme variants sound tougher, while the intraspeaker comparisons show that (ay0) in the moderate guise was evaluated less tough than neutral. Although the extreme guise does not show significant intraspeaker differences, these other results suggest that the moderate variants are evaluated as less tough than neutral and less tough than the extreme variants. Looking at the Masc/Fem scale, both intraspeaker and matched guise comparisons show significant difference in evaluation such that the moderate variants are rated as less masculine than neutral and less masculine than the extreme variants. This could indicate that the moderate variants are evaluated as less masculine or more average for men. Because none of the averages for the moderate variants receives evaluations less than 4, it is not possible to say that the moderate variants of (ay0) are evaluated as more feminine than the more extreme variants. However, these data suggest that the overall community evaluation is that
masculine and tough men are expected to produce more backed variants of (ay0). For the female data, there is no evidence regarding the evaluation of this variable on the Tough and M/F scales. However, unlike the male data, there is information about overt and covert prestige of (ay0) for female speakers. According to the matched guise comparison, the extreme variants of (ay0) are evaluated lower on Job scale. This is further supported by the downgraded evaluation of (ay0) in the extreme guise from the neutral speech in the intraspeaker contrasts. In addition to the Job scale, the extreme guise is downgraded on the Friend scale from neutral. Both of these comparisons lead to the negative evaluation of the extreme variants of (ay0) when used by a female speaker. Both on an overt and covert level, extreme (ay0) variants for women are not prestigious. Finally, all of these findings suggest that evaluations of linguistic variables are not equal for men and women. In fact, as shown with (ay0), men and women are evaluated on completely different scales regarding linguistic information: female speakers, through the Job and Friend scales, show evaluation with overt/covert prestige, whereas male speakers, through Tough and M/F scales, show evaluation on the more gender side of things.

6.2.2 SRT difference evaluations: Social dimensions of evaluators

Unlike the previous discussion, the analysis of the social dimension of the evaluators is based on only 56 participants. The three raters who were not used in the production analysis were not included in these analyses due to lack of social information coding and production data. Using this set of evaluators, and in order to determine if social factors of the evaluators play a significant role in their evaluations, this section
looks at differences in evaluations rather than differences between raw scores. With raw scores, one evaluator could use an overall higher rating range for all the utterances than another, which may be more reflective of individual differences in how critical an evaluator is of others rather than a difference in evaluations of the variables. In this instance, keeping social factors constant, one evaluator may give an utterance a score of 5, while a more critical evaluator may give a score of 3. However, comparing the first evaluator’s score from one utterance to his/her score of another utterance may yield a difference of 1. Likewise, the second evaluator may also show a difference score of 1, although the raw scores are different for both utterances. It is this pattern that two evaluators are reacting to the different utterances in the same way that is predictive of their evaluations of the variables, rather than their critical personality traits. The following sections will examine two sets of difference scores: differences in matched guise ratings, and intraspeaker differences of neutral utterances vs. variables.

6.2.2.1 SRT difference evaluations: matched guise

While some patterns emerged from the unified speech community regarding the evaluations of (ay0), it is necessary to identify any possible social variables of the evaluators that show a significant effect on predicting ratings. In order to do this, the average rating for each variable and scale for the extreme Philly guise (Ben2 and Jill2) was subtracted from the corresponding average rating for the moderate guise (Ben and Jill). This difference in guise ratings produces different outcomes depending on the scale. For the Job, Friend and Tough scales, a positive difference indicates a correlation of a higher scale score with the moderate variants, whereas a negative score indicates a
correlation of a higher scale score with the extreme variants. For the Masc/Fem scale, there is a difference based on the sex of the speaker. For Jill, a positive difference indicates a correlation of a higher score (less feminine or more average) with the moderate variants, whereas a negative score indicates a correlation of a higher score with the extreme variants. Another way to look at this scale is that a positive difference evaluates the more extreme variants as more feminine, whereas a negative difference evaluates the moderate variants as more feminine. For Ben, a positive difference indicates a correlation of a higher score (more masculine) with the moderate variants, whereas a negative score indicates a correlation of a higher score with the extreme variants. Another way to look at the male version of this scale is that a positive difference evaluates the more extreme variants as less masculine or more average, whereas a negative difference evaluates the moderate variants as less masculine or more average.

With this configuration of the data, there are 12 guise differences for each sex (four scales, three linguistic variables). Only guise differences for (ay0) that reach a statistical significance of \( p < .01 \) level as discussed above are investigated further. For each of these 3 possibilities, a stepwise multiple regression model was constructed using an evaluator’s guise difference score as the dependent variable, and the following social factors: age (as a continuous variable), sex, sexual orientation (gay/heterosexual), education, occupation, residence, neighborhood, ethnicity, generation and mobility. Each guise difference was run through the stepwise process following the methodology in the previous chapters (\(.10\) to enter, \(.10\) to exit) in order to identify any significant social variable. Table 6.5 displays the social variables selected in the stepwise process
(indicated with a checkmark) for each linguistic variable/scale for each guise difference for each speaker (J = Jill and B = Ben). The non-significant guise differences are shaded in grey, and any social factor that was not selected by the stepwise process is blank.

<table>
<thead>
<tr>
<th>(Var)Scale</th>
<th>AGE</th>
<th>SEX</th>
<th>SO</th>
<th>ED</th>
<th>OCC</th>
<th>RES</th>
<th>NBRHD</th>
<th>ETH</th>
<th>GEN</th>
<th>MOB</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ay0)J</td>
<td>J</td>
<td>B</td>
<td>J</td>
<td>B</td>
<td>J</td>
<td>B</td>
<td>J</td>
<td>B</td>
<td>J</td>
<td>B</td>
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<tr>
<td>(ay0)T</td>
<td></td>
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<tr>
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</tbody>
</table>

As the above chart indicates, age is not a significant social factor predicting a difference between guises, indicating that there is not a pattern based on age predicting an evaluator’s difference score. Like age, the sex, sexual orientation, or neighborhood or origin of the evaluator is also not a significant factor in predicting ratings with regard to guise differences. The following discussion will investigate if any social characteristics of the evaluators emerge as a significant factor in predicting guise difference values.

6.2.2.1.1 SRT DIFFERENCE EVALUATIONS: MATCHED GUISE: JILL (ay0) JOB

As stated above, significant guise difference scores for Jill for (ay0) are found in the Job scale. The social factors selected by the stepwise process in this scale are residence, occupation and ethnicity. In a multiple regression model with Jill’s guise difference score for (ay0) Job scale as the dependent variable and residence, occupation and ethnicity as the independent social factors, only 12% of the variation is accounted for by this model ($r^2 = 0.116$), and the overall fit of this model, as measured by the analysis
of variance F ratio, is not significant (p = 0.1896). This indicates a poor fit for accounting for the variation with these social factors. Furthermore, none of the social variables show a significant effect on the (Occupation p = 0.1093; Residence p = 0.2530; and Ethnicity p = 0.3136). The only level of any of these social variables that shows a significant difference from the mean of the means of the variable is an occupation score of 6 (p = 0.0044). The predicted guise difference values by occupation with the p value for each occupation level are shown in Figure 6.16 below, with significant p values in bold.

![Figure 6.16](image)

Figure 6.16 Jill (ay0) Job guise difference predicted values by occupation

While only the highest occupation level shows a significant departure from the mean of the means, the above figure demonstrates that it is the evaluators in the highest occupation class who found the largest guise differences. Furthermore, the two lowest occupations show either almost no guise difference values (as in occupation level 2) or a negative difference. This indicates that the lower end of the occupation spectrum does not evaluate the extreme variants lower on the Job scale for the female guises. The above
picture suggests that with respect to the overt prestige, that the prestige of the moderate
comains comes from the upper end of the social spectrum, at least as represented by
occupation.

Substituting SEC for occupation and residence, however, does not increase the
amount of variation explained by the new model ($r^2 = 0.069$) and the overall fit of the
model is still not significant (F ratio $p = 0.2167$). Furthermore, ethnicity is still not
significant ($p = 0.4030$), and neither is SEC ($p = 0.0918$). Furthermore, none of the SEC
levels show a significant departure from the mean of the means of that variable.
Therefore, while the occupation levels show some difference in evaluation along a social
class dimension, this is not further supported by a SEC analysis.

6.2.2.1.2 SRT difference evaluations: matched guise: Ben (ay0) Tough

Turning now to the evaluation of the male speaker, the first scale for (ay0) to
show a significant difference in guises is Tough. The stepwise process selected
education, neighborhood and ethnicity as significant social factors predicting guise
difference values. Using the difference value between Ben’s guises for (ay0) Tough as
the dependent variable, a multiple regression model was constructed with education,
neighborhood and ethnicity as the independent social factors. This model can account for
29% of the variation ($r^2 = 0.292$), but the overall fit of the model measured by the F ratio
is significant at the $p < .05$ level, but not the $p < .01$ level ($p = 0.0124$). However,
etnicity does not show a significant effect on the whole model ($p = 0.0362$), and neither
does education or neighborhood ($p = 0.1082$ and $p = 0.3061$, respectively). The only
level of any of these variables that shows a significant difference from the mean of the
means of the variable is an ethnicity of I (½ Irish ½ Italian). Figure 6.17 shows that with the exception of the one evaluator coded as W ethnicity, all of the other evaluators agree with a negative guise difference score for Ben (ay0) Tough, indicating that they find the more extreme guise tougher. Evaluators with an ethnicity of I (½ Italian ½ Irish) show significant differences from the mean of the means (\(p = 0.0088\)), and they also show the largest difference scores between the two guises.

![Figure 6.17 Ben (ay0) Tough guise difference predicted values by ethnicity](image)

**Figure 6.17** Ben (ay0) Tough guise difference predicted values by ethnicity

### 6.2.2.1.3 SRT difference evaluations: matched guise: Ben (ay0) Masc/Fem

The other (ay0) scale that shows significant different evaluations of Ben’s guises is the Masculine/Feminine scale. According to the stepwise process, education, occupation, generation and mobility are possible significant social factors in predicting difference scores. The multiple regression model constructed from these variables can account for 26% of the variation \(r^2 = 0.258\) and the overall fit of the model measured by the F ratio is significant at the \(p < .05\) level, but not the \(p < .01\) level \(p = 0.0162\). None
of the social factors show a significant effect on the whole model (Generation p = 0.0774; Education p = 0.4443; Occupation p = 0.2076; and Mobility p = 0.1145). Furthermore, none of the levels of any of these categories show a significant departure from the mean of the means for that variable. From these data, then, no social characteristics of the evaluators emerge as significant factors in predicting a guise difference value.

6.2.2.1.4 SRT DIFFERENCE EVALUATIONS: MATCHED GUISE: SUMMARY

The above analysis examined three instances that show significant differences in guise evaluations. None of these instances show any effect of age or sex of the evaluator on the guise difference scores. No social factors show a significant effect on evaluators’ guise difference values for Ben (ay0) M/F. The only significant social factor for Ben (ay0) Tough is an “I” ethnicity, indicating that evaluators who are half Irish and half Italian show the largest guise difference scores and they find the extreme variants to be tougher. Finally, the analysis of Jill (ay0) Job shows that there is some effect of occupation on difference scores, suggesting that the evaluators in the highest occupation group show the largest difference score and that they rank the moderate variants higher on the Job scale. Overall, however, there is little evidence to suggest any discontinuity in the evaluation of these linguistic variables in the speech community.

6.2.2.2 SRT INTRASPEAKER DIFFERENCE EVALUATIONS

While the previous section examined possible social factors of the evaluators as predictors of their guise difference values, this section looks at differences in evaluations within each speaker, comparing the neutral sentences to the two sociolinguistic variables.
In order to do this, the average rating for each variable for each scale for each guise was subtracted from the corresponding average rating of the neutral sentences. This difference in intraspeaker ratings produces different outcomes depending on the scale. For the Job, Friend and Tough scales, a positive difference indicates a higher scale score for the neutral setting, whereas a negative score indicates a higher scale score for the variable. For the M/F scale, there is a difference based on the sex of the speaker. For Jill, a positive difference indicates that the neutral setting is more feminine than the variable, whereas a negative score indicates that the variable is more feminine than neutral. For Ben, a positive difference indicates that the variable is more masculine than neutral, whereas a negative score indicates that the neutral sentences are more masculine than the variable.

Only intraspeaker differences that reach a statistical significance of \( p < .01 \) level as discussed above are investigated further. For each of these 6 possibilities, a stepwise multiple regression model was constructed using an evaluator’s guise difference score as the dependent variable, and the following social factors: age (as a continuous variable), sex, sexual orientation (gay/heterosexual), education, occupation, residence, neighborhood, ethnicity, generation and mobility. Each guise difference was run through the stepwise process following the methodology in the previous chapters (.10 to enter, .10 to exit) in order to identify any significant social variable. Table 6.6 displays the social variables selected in the stepwise process (indicated with a checkmark) for each linguistic variable/scale for each intraspeaker difference for each guise.
Table 6.6 Social variables selected by stepwise process for intraspeaker differences

<table>
<thead>
<tr>
<th>Guise(Var)Scale</th>
<th>AGE</th>
<th>SEX</th>
<th>SO</th>
<th>ED</th>
<th>OCC</th>
<th>RES</th>
<th>NBRHD</th>
<th>ETH</th>
<th>GEN</th>
<th>MOB</th>
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</thead>
<tbody>
<tr>
<td>Ben(Ø-aw)T</td>
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<td>✓</td>
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</tr>
<tr>
<td>Ben(Ø-aw)MF</td>
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<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ben(Ø-ay0)T</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td></td>
</tr>
<tr>
<td>Ben(Ø-ay0)MF</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Jill2(Ø-ay0)J</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td>Jill2(Ø-ay0)F</td>
<td>✓</td>
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<td>✓</td>
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<td>✓</td>
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</table>

As shown in the table above, no instances of significant intraspeaker differences show any effect of age or mobility on the evaluations. In order to determine if any of these other social factors play a part in predicting intraspeaker difference values, each of the six significant guise/scales combinations will be explored in more detail.

6.2.2.2.1 SRT INTRASPEAKER DIFFERENCE EVALUATIONS: Ben (Ø) – (aw) TOUGH

The first of the significant intraspeaker differences is Ben on the Tough scale with the difference between neutral and (aw). In a multiple regression model with this difference value as the dependent variable and residence, ethnicity and generation as possible independent factors, only 6% of the variation is accounted for ($r^2 = 0.059$), and the overall fit of the model measured by the F ratio is not significant ($p = 0.2915$). Furthermore, none of the social variables show significant effects on the model (Residence $p = 0.3418$; Ethnicity $p = 0.2542$; and Generation $p = 0.1994$). Likewise, none of the levels of any of the variables show a significant difference from the mean of the means of that variable. Therefore, there are not any significant social factors that predict an intraspeaker difference value for Ben (aw) Tough.
6.2.2.2 SRT INTRASPEAKER DIFFERENCE EVALUATIONS: BEN (Ø) – (aw) M/F

The other significant intraspeaker difference found with (aw) and the neutral sentences is also for Ben, but on the M/F scale. In a multiple regression model with this difference value as the dependent variable and residence and ethnicity as possible independent factors, 8% of the variation is accounted for ($r^2 = 0.081$), and the overall fit of the model measured by the F ratio is not significant ($p = 0.2002$). Furthermore, neither do the social variables show significant effects on the model (Residence $p = 0.4861$ and Ethnicity $p = 0.2602$), nor do any of the levels of any of the variables show a significant difference from the mean of the means of that variable. Again, there are not any significant social factors that predict an intraspeaker difference value for Ben (aw) Tough. These above two discussions show that the evaluations of (aw) are fairly weak in these data, but that there is uniform community opinion regarding the variable.

6.2.2.3 SRT INTRASPEAKER DIFFERENCE EVALUATIONS: BEN (Ø) – (ay0) TOUGH

Switching to the differences between the neutral sentences and the variable (ay0), the intraspeaker difference values for Ben emerge in the same two scales as with (aw). In the first Tough scale, the most social factors were selected by the stepwise process than any of the other five significant intraspeaker differences. In addition to age, sexual orientation and ethnicity, all of the social class factors were selected (residence, education and occupation). In a multiple regression model with this difference value as the dependent variable and the above listed social variables as possible independent factors, 25% of the variation is accounted for ($r^2 = 0.248$), but the overall fit of the model
measured by the F ratio is still not significant (p = 0.0634). In addition, none of the social variables show significant effects on the model (Age p = 0.2008; SO p = 0.0780; Ethnicity p = 0.4782; Residence p = 0.0146; Education p = 0.1827; and Occupation p = 0.0721). The only level of any variable that shows a significant difference from the mean of the means of that variable is residence level 5 (p = 0.0011). In order to gain more insight into this social factor, Figure 6.18 displays the predicted intraspeaker difference value by residence level, including the p values in parenthesis, with significant p values in bold.

Figure 6.18 Ben (Ø) – (ay0) Tough predicted intraspeaker difference values by residence

As the above figure illustrates, the next to highest residence level shows a significant difference from the mean of all the levels in this social variable. While residence levels 1 and 2 do not show a significant difference from the mean at the p < .01 level, they are significant at the p < .05 level which suggests a pattern. Furthermore, the difference value for residence levels 1 through 4 is positive, but negative for the two highest residence levels. This change in signs shows a difference in opinion of the
evaluation of the toughness of the moderate variants of (ay0). Evaluators at the lower end of the residence scale suggest that the moderate (ay0) is less tough than neutral, while evaluators in the top two residence levels rated moderate (ay0) variants in the opposite way. While the pattern is not completely clear due to the small intraspeaker difference evaluations from raters in residence 6, these data do suggest that the moderate variants of (ay0) are evaluated differently depending on some social stratification of the evaluators. This is not supported by the other social class variables, and a multiple regression model substituting SEC for these three variables fails to account for any of the variation ($r^2 = -0.013$). In the model with SEC, none of the other social variables show a significant effect (Age $p = 0.4290$; SO $p = 0.3033$; and Ethnicity $p = 0.3755$), and SEC as a variable decidedly does not either ($p = 0.9870$). Therefore, this suggests that the pattern is really only captured by the residence score of the evaluators, and may not be directly correlated with social class.

6.2.2.2.4 SRT INTRASPEAKER DIFFERENCE EVALUATIONS: BEN (Ø) – (ay0) M/F

Similar to the Tough scale, the stepwise process selected all three social class variables (education, occupation, residence), as well as ethnicity, as possible social factors predicting intraspeaker difference evaluations for Ben (ay0) M/F. The multiple regression model constructed with these factors can account for 20% of the variation ($r^2 = 0.203$), but the overall fit of the model measured by the F ratio is not significant ($p = 0.0897$). While occupation and ethnicity do not show significant effects on the model ($p = 0.1909$ and $p = 0.2631$, respectively), education ($p = 0.0251$) and residence ($p =$
0.0239) do (but at the p < .05 level only). Since these two variables show weak effects, they will both be investigated.

According to the overall finding with respect to this scale, the neutral variable was evaluated as more masculine than the moderate (ay0) variants. This result is represented by a positive difference score. As shown in Figure 6.19 below, the top three education levels show the largest positive predicted difference values. Education level 3, however, shows a significant reversal in the direction of intraspeaker evaluation. This indicates that evaluators who graduated high school but attended no college do not agree with the rest of the evaluators.

![Figure 6.19](image)

*Figure 6.19* Ben (Ø) – (ay0) M/F predicted intraspeaker difference values by education

Similar to the intraspeaker difference values for Ben on the Tough scale, on the M/F, residence also shows an effect. Figure 6.20 shows predicted intraspeaker difference values for Ben for this scale.
While none of the levels of the residence variable shows significant differences from the mean of the means of the variable, a similar pattern to the effects of residence on Ben (Ø) – (ay0) Tough emerges. This is the effect that residence level 5 has on the intraspeaker difference values. As the above figure shows, these evaluators show a negative value, disagreeing with the overall evaluation that the neutral sentences are more masculine than the moderate (ay0) variants.

The above two social variables do not support a generalization that Ben’s intraspeaker difference values for this scale and variable are related to the social standing of the evaluator. In fact, the results from education and the results from residence do not match up and point to the same ends of the social spectrum as showing similar difference values. When SEC is substituted for the three social class variables, almost none of the variation is accounted for ($r^2 = -0.014$) and the overall fit of the model is not significant ($p = 0.5199$). Furthermore, ethnicity is still not a significant factor ($p = 0.4052$) and SEC shows almost no effect on the model at all ($p = 0.9054$). This indicates that while there
may be some weak patterns emerging based on education or residence, these cannot be traced to social class stratification of evaluators.

6.2.2.2.5 SRT INTRASPEAKER DIFFERENCE EVALUATIONS: JILL2 (Ø) – (ay0) JOB

The first of the two significant intraspeaker differences for the female data is for Jill2 (ay0) on the Job scale. The stepwise process selected age, occupation and neighborhood as possible significant social factors affecting an evaluator’s intraspeaker difference value. In a multiple regression model constructed with these factors, only 11% of the variation is accounted for ($r^2 = 0.114$), and the overall fit of the model measured by the F ratio is not significant ($p = 0.1272$). In addition, none of the social factors show a significant effect on the overall model (Age $p = 0.0415$; Occupation $p = 0.3266$; and Neighborhood $p = 0.5209$). Furthermore, none of the levels of any of these categories show a significant difference from the mean of the means of that category. Therefore, there will be no further investigation into any of these social variables.

6.2.2.2.6 SRT INTRASPEAKER DIFFERENCE EVALUATIONS: JILL2 (Ø) – (ay0) FRIEND

The other significant intraspeaker difference for the female data is for Jill2 (ay0) on the Friend scale. The stepwise process selected neighborhood, ethnicity and generation as possible significant social factors affecting an evaluator’s intraspeaker difference value. In a multiple regression model constructed with these factors, only 11% of the variation is accounted for ($r^2 = 0.111$), and the overall fit of the model measured by the F ratio is not significant ($p = 0.1791$). In addition, none of the social factors show a significant effect on the overall model (Neighborhood $p = 0.1872$; Ethnicity $p = 0.2600$;
and Generation $p = 0.5214$). Furthermore, none of the levels of any of these categories show a significant difference from the mean of the means of that category. Therefore, there will be no further investigation into any of these social variables.

### 6.2.2.7 SRT INTRASPEAKER DIFFERENCE EVALUATIONS: SUMMARY

Examining each of the instances that show significant intraspeaker difference values, no patterning of social characteristics of the evaluators emerge. While there is one recurring pattern for (ay0) for two scales of Ben’s data, there is no further evidence to support a generalization regarding the social class of the evaluator’s predicting an intraspeaker difference value. As with the matched guise results, these data show a uniform speech community with respect to evaluation of linguistic variables.

### 6.3 CHAPTER 6 SUMMARY

As discussed above, there are some significant findings regarding the evaluation of (ay0), but little data on the evaluation of (aw). Although the LCV SRT analysis shows a downgrading of the extreme variants of (aw), the results from the OMM SRT do not show any significant reactions to this variable through the matched guise aspect. In the intraspeaker comparisons, the female guises show no significant differences from the variable and the zero passages, but there is a significant effect for the moderate male guise on the Tough and M/F scales. The moderate variants of (aw) are evaluated as less tough and less masculine than neutral. However, there is not further support for this aspect, since the extreme variants are not evaluated as more tough or more masculine than neutral, and there are no significant matched guise differences. The reason that there
is only one weak effect regarding (aw) may be due to a flaw in the design of the SRT in
that not extreme enough variants were used, or that the guises did not represent the range
of variants for this variable in a realistic way. Another possible explanation for lack of
evaluation of (aw) could be the reversal of the direction of the change regarding this
variable as noted in the previous chapter. That is, if the overall speech community is
reversing the direction of this change, there is a fairly wide representation of variants
existing in the community and these variants may have lost the social information needed
for this type of subjective reaction. A moderate variant of (aw) could either be
representative of an older speaker lagging in the fronting of the variable, or of a younger
speaker at the forefront of the backing change.

Regarding (ay0), however, the LCV data shows a sensitive reaction to the extreme
variants, with a severe downgrading of the most advanced speaker, and a positive effect
for the more conservative variants regarding the Job scale (Labov, 2001, pp. 210-11).
These effects vanish for (ay0) on the Friend scale, and no significant evaluations are
shown for this variable for this scale. The current study’s SRT data show similar
evaluations, with significant effects for the female guises on both the Job and Friend
scales. The extreme variants of (ay0) as used by a female speaker are evaluated lower on
the Job and Friend scales, indicating that these raised and backed variants do not have
either covert or overt prestige for female speakers. For the male data, however, the
significant evaluations are on the Tough and Masculine/Feminine scales, and not the
Friend and Job scales. These data suggest that the more extreme variants used by a male
speaker are evaluated as more masculine and tougher than the moderate variants.
Additionally, the moderate variants when used by a male speaker are considered less
masculine and tough than neutral. These findings show that for (ay0), male and female speakers are evaluated in different ways. The female speaker is evaluated with respect to overt/covert prestige, while the male speaker is evaluated with respect to appropriate gender behavior based on language use. From this clear split, it might be hypothesized that there would be a significant effect of the sex of the evaluator on these evaluations, but analyses of the effects of the social characteristics of the evaluators on their ratings show a consistency in the speech community, supporting the LCV data. This shows that while men and women are evaluated in different ways regarding the use of variables implicated in language change, men and women do not evaluate speakers differently. There is a consistency in subjective reactions to linguistic variables that spans the entire speech community and social factors show no significant effect on a person’s evaluation.
7.0  **INTRODUCTION**

The purpose of this chapter is to present a summary of the preceding chapters and to recapitulate some of the discussion put forth in those chapters regarding language change. Prior to this summary, this chapter will also examine the limitations of this current study and offer suggestions for future work.

7.1  **LIMITATIONS**

The main goal of this dissertation was to move beyond the binary distinction based on anatomical sex and explore the effects of socially constructed gender on linguistic change. In order to achieve this goal, this study did not abandon the quantitative sociolinguistic variationist framework, but rather attempted to modify the framework. Therefore, the construction of a gender index (GI) was designed and implemented following the methodology designed to investigate the multidimensional aspects of socioeconomic class. Sorting the speakers based on a gender category of masculine, feminine and neutral based on the GI, however, yielded little additional information from sorting the data by sex and/or sexual orientation. This limitation of the usefulness of the GI could be due to the lack of heterosexual speakers who are classified as neutral, as well as lack of homosexual speakers classified as feminine or masculine. A more objective measure is needed to serve as an indicator for the relative masculinity or femininity of a given person involved in a study. While this dissertation adopted the use
of socialization experience based on an acquisition model of socialized behavior, other indices need to be examined for their possible correlations of a person’s masculinity or femininity. Finally, the examination of a person’s gender as a set of static traits may be inherently flawed, and only information gained through intraspeaker linguistic variation may accurately reflect the truly dynamic force that is socially constructed gender. While this dissertation shows one aspect of the picture of language change in a given community, it may have excluded other relevant information that is concealed not in the data set itself, but rather by the methodology adopted in this framework of data collection. The fact that the traditional quantitative variationist framework can uncover many aspects of language change is supported by this dissertation. Whether this is enough information to build accurate theories about the mechanism and actuation of linguistic change, or if these data represent merely the tip of the iceberg, is still open for empirical investigation.

7.2 SUGGESTIONS FOR FUTURE STUDIES

As stated above, there is still a large need for more empirical studies into the various aspects of language change. One of these aspects is the importance of socially constructed gender and how this operates within a language change situation. One of the best ways to acquire this information is to examine the true variability that occurs through linguistic behavior as mapped onto the variability presented in different social interactions. That is, linguistic behavior has been shown repeatedly to be a variable aspect of human social interaction, so the idea of accounting for that variability with invariable social categories may yield some information, but certainly not the complete
picture. From this position, then, it is paramount for studies to include a range of speakers demographically based on these static social factors, but also to include a range of stylistic behavior for each of these subjects to see how linguistic behavior changes as social behavior changes.

One other aspect of language change that was only suggested in this dissertation is the shift in regional dialect affiliation of an entire speech community. Future work needs to examine if Philadelphia is transitioning from a southern American speech community to a northern one, or if there is some other explanation for which variables are implemented in change and in which direction. Other changes linked to northern American varieties, such as (e)-lowering and (ʌ)-backing, need further investigation.

Finally, more investigations are necessary to examine the effects that sexual orientation have on language change and variation, as well as offer explanations for any discovered differences in behavior. While sexual minorities compose a different type of community from one based on race, social class, or ethnicity, they do show shared experiences and cultural similarities that span regional, and to some extent, international, differences. Therefore, as an aspect of identity, linguistic behavior needs to be further investigated in these groups to portray the possible connections between language and socially constructed identity. Some of the questions that need to be investigated are:

- Do gay men or lesbian women form a sociolect that is beyond regional variation?
- Do gay men pattern differently from lesbian women with respect to where a speaker situates him/herself in a language change situation?
- What is the relationship between sexual orientation and gender?
• Is there a connection between social class and sexual orientation? Is there a connection between working class and masculinity or middle class and femininity?

7.3 SUMMARY OF THIS STUDY

As stated above, there are limitations to the current study, as well as suggestions from this work for future investigations. However, this dissertation does present a picture of linguistic change that offers more insight than some of the previous work. As stated before, the overall goal of this dissertation project is to investigate the social variable of gender in greater detail. In order to achieve this goal, the three sociolinguistic variables implicated in language change and identified as “new and vigorous changes” by Labov (2001) are examined through a re-study of the Philadelphia speech community. This summary presents the results from the investigation of these three variables as offered in Chapters 4 and 5.

7.3.1 SUMMARY: (ay0)

While all three “new and vigorous” sociolinguistic variables are discussed in the previous chapters, the focus of this dissertation is the raising (and backing) of the nucleus of the diphthong /ay/ before voiceless consonants (ay0). This variable is investigated using both an apparent time and a real time analysis. In addition, the subjective evaluations of this variable are also examined.
7.3.1.1 SUMMARY: (ay0) IN APPARENT TIME

Like the analysis of the LCV data (Labov, 2001), the current study shows a raising of this variable in apparent time. Based on the first series of apparent time analyses, there is a unified community change, with no stratification of the community by either sex or social class. However, the social class distribution of the data shows a faster rate of change for the working classes than the middle classes. These data also show that the more raised variants are produced by the middle classes in the older speakers, but by the working classes in the younger speakers, demonstrating a change that may have been begun by the upper middle class, but is now being advanced more in the working classes. Regarding sex, these data do not support the findings from the LCV that this change is being led by men. In fact, there appears to be no sex differentiation in the current data set. Additionally, none of the other gender variables examined in this dissertation show an effect on F1 (ay0). Regarding the raising aspect of this change at this snapshot in time, the current data show a unified speech community raising the nucleus of the diphthong /ay/ before voiceless consonants.

Although the front-back dimension of this variable is not implicated in change, the data show a social class distribution effect with the upper end of the social spectrum showing more fronted variants, while the lower end with more backed variants. The most extreme backed and raised variants are produced by lower working class men, while the most fronted variants are produced by the upper middle class women.
7.3.1.2 SUMMARY: (ay0) IN REAL TIME

This variable was also examined using a combined data set of both the current study and the LCV data. With a real time analysis, the raising of this variable is still supported, although the linearity of language change is not supported, showing step-like increases in certain points in time, followed by plateaus. Regarding sex, the real time data show a different amount of sex differentiation at each age increment. Furthermore, the real time data show that there was a unified community change regarding the raising of this variable, but then as the change progressed, a sex differentiation pattern emerges that fluctuates with each age group. Based on these data, the picture of language change that surfaces is one in which sex differentiation is something that must be maintained by each generation, and that one sex shows a retrograde movement at certain points in time to maintain this differentiation. The real time data also show a lack of social stratification with respect to this aspect of the variable.

Regarding the F2 dimension, while neither data set alone shows change in F2 over time, the real time analysis does show a significant age effect. The variable is not only raising, but backing over time as well. While sex does not play a role in the F2 dimension in the real time analysis, there is social stratification with the working classes showing more backed realizations. Finally, sorting the data by class, only the working classes show a significant age effect, indicating that it may only be the working classes that are backing and raising over time, while the middle class is only participating in the raising of this variable.
7.3.1.3 **SUMMARY: SUBJECTIVE REACTIONS TO (ay0)**

The data regarding the subjective dimension of this variable show significant differences of the evaluations of the moderate variants (mid central nuclei) versus the extreme variants (mid back nuclei). Furthermore, female speakers are evaluated differently than male speakers regarding this variable. The extreme variants by a female speaker are downgraded in terms of overt and covert prestige as measured by the Friend and Job scales. The extreme variants by a male speaker, however, do not show any significant evaluation differences from the moderate speakers regarding these scales. Regarding the Masculine/Feminine and Toughness scales, however, the extreme variants produced by a male speaker are evaluated as tougher and more masculine. The different variants by a female speaker do not show significant differences in evaluation on the Tough and Masculine/Feminine scales. Basically, from these data, women are evaluated in terms of overt and covert prestige, while men are evaluated based on gender issues. Finally, the speech community shows uniformity in evaluations, suggesting that regardless of what variants a person produces, the entire community shares the same evaluations of those variants.

7.3.2 **SUMMARY: (aw)**

Like (ay0), (aw) shows a significant age effect, indicating change in progress regarding this variable. Unlike (ay0), however, the change is along the F2 dimension. (aw) was also investigated using both an apparent time and a real time analysis. Additionally, while the subjective evaluations of this variable were examined, the data
show no significant difference in evaluations of extreme and moderate variants, so no further discussion regarding the subjective reaction of this variable will be presented.

7.3.2.1 SUMMARY: (aw) IN APPARENT TIME

Contrary to (ay0), the apparent time analysis of (aw) shows language change in the opposite direction of the analysis of the LCV data. According to the current study, this variable is backing over time, but only for the women. Examining gender in greater detail with this variable shows that it is the lesbian women who are leading this backing change, with heterosexual women following. Finally, looking at gender, it is the most feminine speakers who show the most fronted variants, indicating that they are lagging in the backing of this variable. The effects of social class on this variable show that the speakers with the most backed variants are in the highest social class, and the most fronted variants are in the interior social classes. One suggestion for these patterns is that the change was originally led by the interior social classes, with the women leading. The men simply did not follow, and in the last few decades, there has been a reversal of the direction, putting the stragglers of the fronting aspect now in the lead of language change. The significant lead of the backing of this variable by lesbian women and by the upper middle class may be a consequence of the reversal of language change, rather than active leaders of linguistic change.

7.3.2.2 SUMMARY: (aw) IN REAL TIME

While the direction of the change regarding F2 of (aw) may be an anomaly in either data set, the real time analysis shows the variable fronting for the oldest speakers,
then backing in the youngest generations, with a span in the middle ages of relative stability. The data also show that sex differentiation is a dynamic aspect of language change and that difference in the sexes fluctuates over the course of the change. Based on these data, it appears that this variable may have reached its front-most point, and the community is now retreating from that point. Finally, the combined data set suggests that the middle classes show the most backed variants, indicating that this change is not being led by the interior social classes, but rather by the middle class as a whole.

7.3.3 SUMMARY: (eyC)

The final sociolinguistic variable identified as “new and vigorous” was the fronting of (eyC). Unlike the LCV, however, the current data only show language change regarding the F1 of this dimension. Like the other two variables, (eyC) was examined using both apparent and real time analyses. This variable was not included in the investigation of the subjective dimension of language change.

7.3.3.1 SUMMARY: (eyC) IN APPARENT TIME

The current data show the raising of this variable, with the most raised variants being produced by lesbian women. Although the lesbian women do not show change over time, the other sex/sexual orientation groups do, indicating that the heterosexual women and men and the gay men are all raising their production of this variable over time to match the lesbian production which has leveled out with respect to age. Similar to the lesbian patterning of (aw), the lesbian women appear to be leading the change of (eyC). Contrarily, it is the gay men who show the most resistance to this change.
Regarding social stratification, the women show a uniform movement with all classes raising this variable, while the men’s data show a lead by the upper middle class. These data suggest that this may be a change from above and that lesbian women are either the models of the change or are quickest to adopt such a change.

7.3.3.2 SUMMARY: (eyC) IN REAL TIME

Looking at the data in real time, the change appears to be progression by generation (20 years), rather than 10 year age increments. Additionally, the change does not progress with a forward progression at each generational step, but rather shows a small retrograde movement, with a larger progressive movement in the direction of the change. That is, the pattern shows a step-like progression, where each generation takes 3 steps forward, and then each half of a generation takes 1 step back. Finally, the data show no sex or social class differentiation, indicating language change by the entire unified community. This variable demonstrates that language change can occur without sex or class differentiation.

Unlike the apparent time analysis, the real time analysis shows language change of the F2 dimension of (eyC). This variable shows a fronting over time, but a relative plateau for speaker under 60, indicating that this aspect of the change may be completed. Unlike the F1 dimension, F2 of (eyC) in real time shows sex differentiation. While the F1 data suggest that language change can occur without sex differentiation, the F2 data suggest that even if a change has come to a standstill, sex differentiation can persist. The speakers under 60 do not show a linear progression with age, but continual sex differentiation. Finally, the F2 dimension in real time does not show social stratification.
7.3.4 **SUMMARY OF LINGUISTIC VARIABLES**

Each of the three variables examined in this dissertation each shows a different picture of language change. Regarding these data, language change can be led by women, or it can be a movement over time not differentiated by sex. These variables also show either no social stratification of language change, or change led by the upper end of the social spectrum. None of these variables supports the curvilinear hypothesis regarding the mechanism of language change. Finally, these data suggest that the sexual orientation of a speaker does impact his or her position in a language change situation. With respect to the evaluation of linguistic variables, these data show that not all variables involved in change show differences in evaluations, and that men and women may be evaluated in completely different ways with respect to their linguistic behavior. Furthermore, while these data show production differences by speakers based on certain social aspects, they do not show a difference in evaluation of these variables correlating with any social factor. That is, variation in production does not predict variation in evaluation, and that the Philadelphia speech community shows a unified reaction to the linguistic behavior of any speaker.

7.4 **CONCLUSIONS**

As shown above and in the previous chapters, this dissertation investigation offers new insight into linguistic change, as well as support for some of the previous findings of other studies. The major findings presented in this dissertation are recapitulated below.
• Language change can progress in a linear fashion based on age, or it can proceed through the community generationally.

• The direction of a given change can progress linearly, in a 3 steps forward - 1 step back fashion, or it can completely reverse.

• Language change can proceed without sex or social class differentiation.

• Sex or social class differentiation can change over time, or it can be continually maintained. The relationship between sex, social class and age is not a fixed ratio and it needs to be upheld, altered or abandoned at each stage of language change.

• The sexual orientation of a speaker shows a significant effect on some aspects of language change. Lesbians are shown to lead two of the three changes presented in this dissertation.

• Not all linguistic variables behave in the same way.

• The evaluation of linguistic variables is uniform in the speech community.

• The evaluation of men’s linguistic behavior operates differently than the evaluation of women’s linguistic behavior. There are different expectations of linguistic behavior based on the sex of the speaker.

Part of the tradition of sociolinguistic work has been the importance of social factors on the prediction of linguistic behavior. This dissertation has shown support for some of the generalizations put forth by sociolinguistic investigations are supported. It has also demonstrated the need to expand the traditional framework to include previously ignored relevant social factors, such as sexual orientation. Finally, this dissertation has reflected the variability that persists not only in linguistic behavior, but also in the mechanism and actuation of language change. While it may be that the source of linguistic theory be derived directly from investigations into the speech community, the development of theories that ignore the possibility of different models of language change existing in the same community simultaneously are lacking in explanatory power.
and now, empirical support. These theorists may have the best intentions of basing linguistic theory on data from the speech community, but these theories, if too rigid, may be unsuccessful. In other words, as Robert Burns states in his poem “To a Mouse:”

The best laid schemes o’ mice and men
Gang aft a-gley.
APPENDIX A

SEMANTIC DIFFERENTIALS

- What’s the difference between a house and a home?
- What’s the difference between icing and frosting?
- What’s the difference between a good man and a nice man?
- What’s the difference between your face and your head?
- What’s the difference between a guy and a boy?
- What’s the difference between to bite and to chew?
- What’s the difference between a turnpike and a highway?

MINIMAL PAIRS

Do you remember that TV show from the 80’s with Don Johnson? It was called Miami _____ (Vice). Or who is next in charge under the president? (The vice president)

What do you use when you talk or sing, that starts with a ‘v’? (voice)

Do these words sound the same? Say them again and tell me which is which.

What’s the word for more than one mouse? 2 ____ (mice).

And what’s the word for something that is a little wet or damp that starts with an “m”? (moist). Except for the final “t” in the word for damp, do these words sound the same?

Say them again and tell me which is which.
Once upon a time, there was a house that was taken over by mice. A cat heard about this and said to herself, “I would be happy in that home.” That night, she went and moved in with the family that lived in the house. Then, the fight between the cat and the mice began. The cat quickly made a habit of catching the mice and biting off their heads. At last the mice could stand it no more, and they decided to go into their holes and stay there. “That’s not very nice,” said the cat to herself. “Now the only thing to do is to coax them out by a trick.” So she thought for a while, and came up with a plan. Excited by her new scheme, she climbed up the wall and let herself hang down by her back legs from a peg and pretended to be dead. By and by, a mouse peeped out and saw the cat hanging there, like a spider on its web. “Aha!” the mouse cried. “You’re very clever, no doubt, but you can turn yourself into a sack of potatoes hanging there if you like, but you won’t catch us coming anywhere near you.”

If you are wise, you won’t be fooled by the innocent actions of those you have once found to be dangerous.
# Appendix C

## Word List

<table>
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# Appendix D

## Gay and Lesbian Terms

Words to describe gay men:

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Words to describe lesbians:

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<td>baby dyke</td>
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REFERENCES


