A Rapid and Anonymous Study of /r/ Vocalization in an /r/ Pronouncing City

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1 Introduction and Research Methods

"Excuse me. Could you tell me where Girard Street is?"
"Oh! You mean Girahd Avenue? ... *"*

This article is based on a rapid and anonymous study of /r/ vocalization in Philadelphia conducted in 2003 and 2004. Results suggest an interaction between an internal factor of sound change–dissimilation–and an external factor of sound change–African American ethnicity. These results were unexpected, since previous studies have indicated that internal and external factors do not interact. We also examined variation across the external factors of gender, age, year of interview, social status, and location within Philadelphia.

Research has shown that /r/ vocalization occurs in any word position except before a vowel (Hempl 1896). It is not a typical feature of Standard American English, though it has been known historically to occur in large cities, especially New York and Boston. While Philadelphia has been recorded as an /r/ pronouncing city (Kurath & McDavid 1961), there is still evidence of some /r/ vocalization in Philadelphia, particularly among Italians (Labov 2001). Similarly, Myhill (1988) found that in Philadelphia, just as throughout the United States, African Americans demonstrate higher rates of /r/ vocalization.

Researchers have long considered African American Vernacular English as a dialect distinctive from white Standard American English. Studies have been conducted on its grammar, lexicon, pronunciation, and geographical and linguistic origins (see Rickford & Rickford 2000 for an in-depth study). Such studies have also considered changes in AAVE over time.

The factors which drive language change are classified in two categories. Internal factors are strictly linguistic factors, such as phonetic or syntactic context, and external factors are nonlinguistic features of the speaker, such as ethnicity, area of origin, or social status. Researchers have found evidence that internal and external factors do not usually interact in processes of language change (Martinet 1955 and Kuryłowicz 1964 as cited in Labov 2001). In our study, however, data indicate that these two factors may in fact interact. We found an interaction between an internal factor, dissimilation,

and an external factor, ethnicity. Through dissimilation, a phoneme may change when it is within the same word or phrase as a similar phoneme. Across all ethnicities in this study, effects of dissimilation were present, but the difference caused by dissimilation was much more widespread among African Americans.

Since this research was conducted as a rapid and anonymous study (Labov 1966), our subjects did not know their speech was being analyzed, and therefore had fewer reservations about speaking naturally. This ensures that our linguistic data accurately represent informal speech. One disadvantage to a rapid and anonymous study, however, is that the researcher can not ask directly about the age, background, and other specific information about the speakers. Nonetheless, the researchers in our study recorded, to the best of their ability, the approximate age of the speaker, the location of interview, ethnicity, social status (service worker or merchant), and gender, along with the pronunciation of the word in question.

The researchers for this project were students in the Introduction to Sociolinguistics class at the University of Pennsylvania. Data were collected from 790 individuals during the spring semesters of 2003 and 2004. The target words in this study were *Market* and *Girard*, both of which contain a post-vocalic /r/. The researchers asked pedestrians, service people, and merchants in Philadelphia one of two questions:

(1) How do I get to Market Avenue?
(2) Where is Girard Street?

Since the street names are actually Market *Street* and Girard *Avenue*, the incorrect names in the questions were intended to prompt the speaker to repeat the street name in order to correct the researcher. Researchers collected data from 322 females and 468 males. The 790 individuals included 314 African Americans, 388 whites, 48 Asians, 22 Italians, and 18 Hispanics. The ages of respondents ranged from approximately 10 to approximately 75. In 2003, 453 tokens were collected, and, in 2004, 337 were collected, giving a grand total of 838 tokens.[1]

Realization of /r/ was coded as 1 and /r/ vocalization as 0. Thus the average of all scores for the word *Girard* (.53) indicates a higher rate of vocalization compared with the overall average for *Market* (.76). The difference between these averages may indicate an expected or average

[1] This is more than the total number of speakers because some researchers prompted the same individual for both words.

degree of dissimilation. Analyses of variance were conducted using SPSS to determine the significance of each population variable in predicting the vocalization of /r/ in *Market* and *Girard*. Chi square tests were used to determine the significance of the difference between the vocalization of /r/ in these two words.

2 Results and Analysis

Ethnicity proved to be the most important variable for predicting /r/ vocalization in this study. A post-hoc analysis using Tukey's HSD revealed that, while there was no significant positive relationship between most ethnicities and /r/ vocalization, there was a significant difference in the African American and white pronunciation of /r/ in both *Market* (p=.007) and *Girard* (p=.000). Results were similar when all other ethnicities were combined and compared with African Americans in the vocalization of these two words.

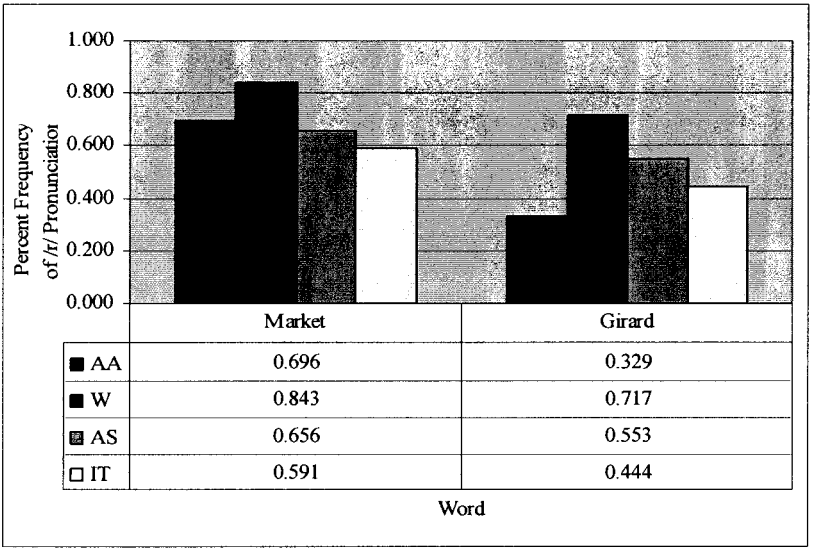
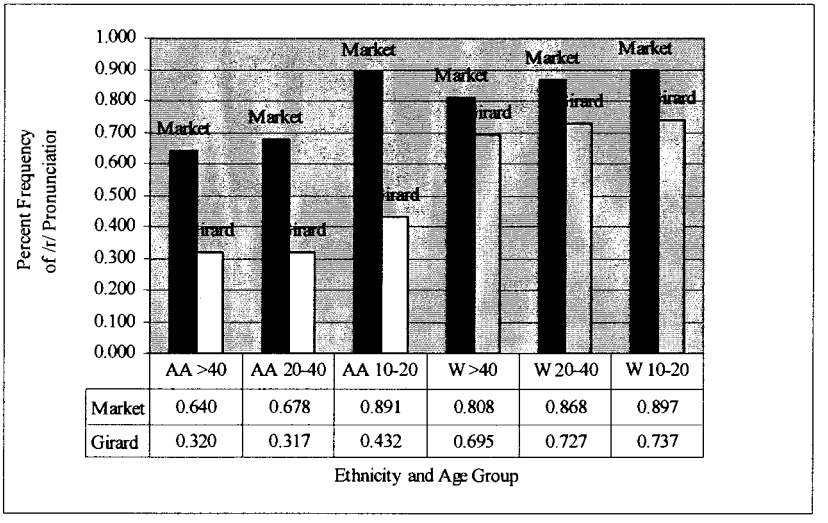


Figure 1: /r/ pronunciation by ethnicity
AA=African American; W=White; AS=Asian; IT=Italian

For most ethnicities, the difference in frequency of /r/ vocalization in *Market* and *Girard* was consistent (See Figure 1). Speakers vocalized the /r/ in *Girard* more frequently due to the effect of dissimilation (*Girard* contains

two /r/ phonemes), but this internal factor did not interact with external factors, except in one case. Among all ethnicities except for African American, the difference between the pronunciation of /r/ in *Market* and *Girard* was 10-15%. For African Americans, however, the difference was 36.7%. A chi-square test verified the significance of this difference between mean pronunciation of /r/ in the two words (p=.012).

These findings suggest that many African Americans may actually have a new underlying form for the word *Girard,* brought about by the impact of dissimilation over time. One of our researchers, after eliciting the vocalized pronunciation *Girahd* from an African American gentleman, began to discuss the pronunciation of the word with him. Interestingly, his various attempts at spelling the word did not include the use of the second "r." This revealed that the second "r" in Girard may not be a part of his conceptualization of the word, a fact that may be true for many other individuals. This uncertainty about the spelling of Girard may provide further evidence that differences in pronunciation go beyond surface-level dissimilation to a change in the underlying form of the word.



	AA >40	AA 20-40	AA 10-20	W >40	W 20-40	W 10-20
Market	0.640	0.678	0.891	0.808	0.868	0.897
Girard	0.320	0.317	0.432	0.695	0.727	0.737

Figure 2: /r/ Pronunciation by Generation

The remainder of this analysis focuses on how and in what ways African Americans are different with regard to their /r/ vocalization patterns. African Americans dissimilate /r/ more frequently than the other ethnicities. Myhill (1988) found that frequency of /r/ vocalization depends on the speaker's

location on a continuum based on the ethnicities of the speaker's primary contacts. Those individuals who interact more with African Americans would be expected to vocalize /r/ more frequently than those who interact more with whites. In the remainder of this analysis, we explore the extent to which certain other external factors affect one's placement on this continuum, or in other words, how these factors increase or decrease the gap between /r/ vocalization patterns in *Market* and *Girard* for African Americans as compared to whites in Philadelphia.

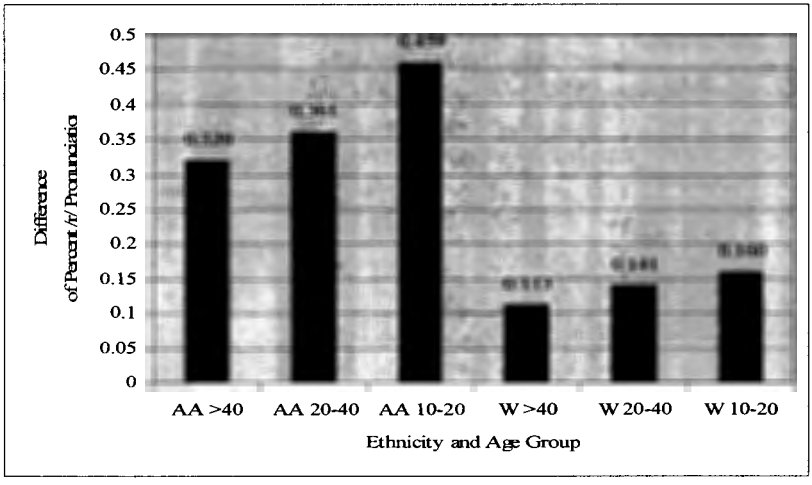


Figure 3: Differences in the pronunciation of /r/ in Girard and Market by generation.

First, we examined age, which is important in determining the nature of the phenomenon in apparent time. For this, we divided African Americans and whites each into three age groups which we expected to represent different generations of /r/ vocalization trends (see Figure 2). The results showed an overall pattern of less frequent vocalization among younger people, meaning that realization of post-vocalic /r/ is becoming more frequent in apparent time. The more interesting feature in relation to age, however, is the fact that the difference between *Market* and *Girard* increases for younger people, indicating that the trend is not simply to vocalize both words less over time (See Figure 3). Indeed, the rates of vocalization of both words appear to be decreasing, but the decrease in vocalization is greater for *Market* than for *Girard*. This indicates that dissimilation is in fact having a bigger, more complicated effect than would be the case if these internal and

external factors were not interacting. This trend holds across both African American and white speakers. If this is truly the direction in which /r/ vocalization is headed, African Americans appear to be leading other ethnicities. A test of significance using Pearson's Correlation revealed that there is a significant correlation between age and /r/ pronunciation in the word *Market* (-.122). However the correlation between age and /r/ pronunciation in the word *Girard* was not significant at the .05 level. Thus, as indicated above, while the younger generation has a significant tendency to realize /r/ more in the word *Market*, this trend towards /r/ pronunciation does not hold true in pronunciation of the word *Girard*, in which an opposite trend towards /r/ vocalization appears to be at work.

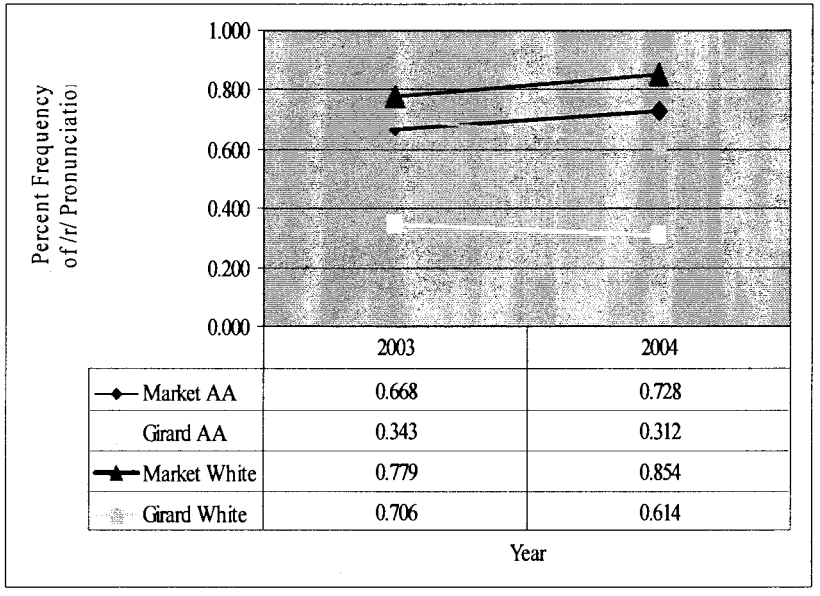


Figure 4: /r/ pronunciation by year

Although two years cannot provide sufficient data to document linguistic change or to check this finding in actual time, we conducted an exploratory comparison of the findings from 2003 and 2004. Although the differences between the two years are not statistically significant, we were surprised to find how these results replicated the findings of the age analysis (See Figure 4). The difference between *Market* and *Girard* grows larger for both ethnicities. Everyone pronounces more /r/ in *Market* in 2004 compared

to 2003, but the change is greater for whites. Pronunciation of /r/ in *Girard* decreases, conflicting with the findings of the age analysis, but the difference between the /r/ vocalization in both words is in fact, still growing according to the year by year study. Despite the fact that this is not a long enough time span to observe true and consistent linguistic change, the change over the one-year interval illustrates the overall trend, namely that the path of future of /r/ vocalization in Philadelphia is not linear. The vocalization of /r/ is decreasing at different rates for different words and for different ethnicities.

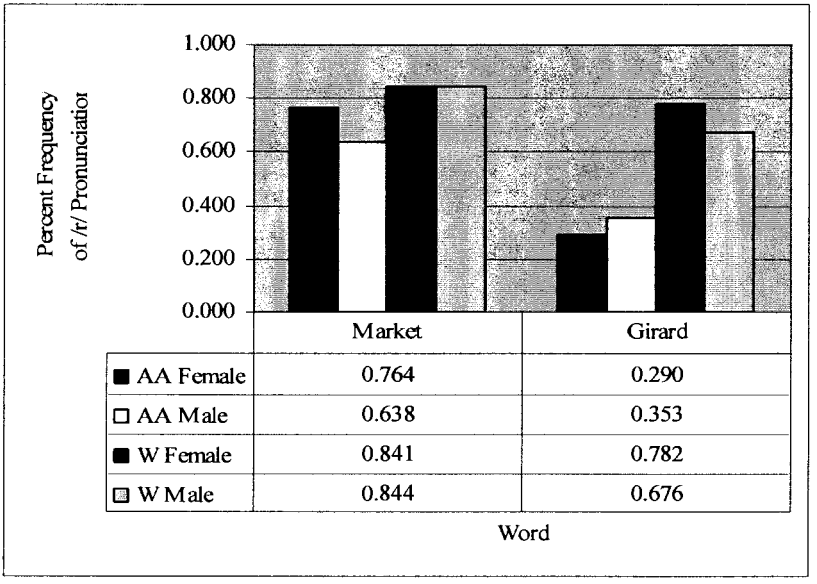


Figure 5: /r/ pronunciation by gender

Next, we examined gender. Each gender exhibited the same overall pattern in which the difference between *Market* and *Girard* was much larger for African Americans than for whites, but the extent to which each gender displayed these trends varied (See Figure 5). The gap between the two words was much larger for African American women (47.4%) compared to African American men (28.4%). Since the age analysis showed that the difference is growing over time, and the gender graph shows that African American women have a larger gap than men, women appear to be leading this sound change, showing more effects of dissimilation. This corresponds with the theory that women tend to lead sociolinguistic changes (Labov 2001). The gap for African American men, though smaller than for African American

women, still appears to be significant, especially in comparison with white men and women (16.8% and 5.9% respectively). White women exhibited the most consistent /r/ vocalization pattern for the two words, as opposed to African American women who exhibited the greatest difference in their /r/ vocalization in the two words. There is a significant difference between African American women and white women in the overall realization of /r/ in *Market* and *Girard* (p=.003).

Linguists are still hypothesizing why in all societies studied to date, women appear to lead linguistic change. Chambers (1995) proposes that women's higher verbal abilities as demonstrated in standardized test scores make them more sensitive to linguistic change. Gordon and Heath (1998) consider the possibility that there is a physical basis for this phenomenon. Labov (2001) proposes that there may be no absolute reason for gender differences, other than the phenomenon itself.

The next factor examined was local status. To approximate a variable pertaining to social status within the limits of this study, researchers recorded the profession of individuals who were working in service or merchant roles when the data were collected. The distinction between the two is not one of class, but one of interaction with customers. "Merchant" refers to anyone trying to sell something, including people involved in retail or sales. "Service" refers to people employed to help the public indirectly, including construction workers and custodial staff as well as police officers. The expectation was that pronunciation patterns among merchants would be closer to the speech of whites, along Myhill's (1988) continuum, because they converse more with whites on the job, and the speech of merchants affects their job more than that of service workers.

As predicted, the data show that merchants pronounce /r/ more frequently than those employed in services (See Figure 6). Interestingly, whites employed in service pronounce /r/ only slightly less frequently in *Girard* than in *Market* (2.9% of the time). It would seem therefore that dissimilation affects this population minimally. In addition, even though merchants vocalized less than those employed in service, the difference between /r/ vocalization in *Market* and *Girard* was consistent for both groups of African Americans (about 30%). This indicates that local status, while following the trend of large differences between *Market* and *Girard* /r/ vocalizations for African Americans, does not interact with dissimilation.

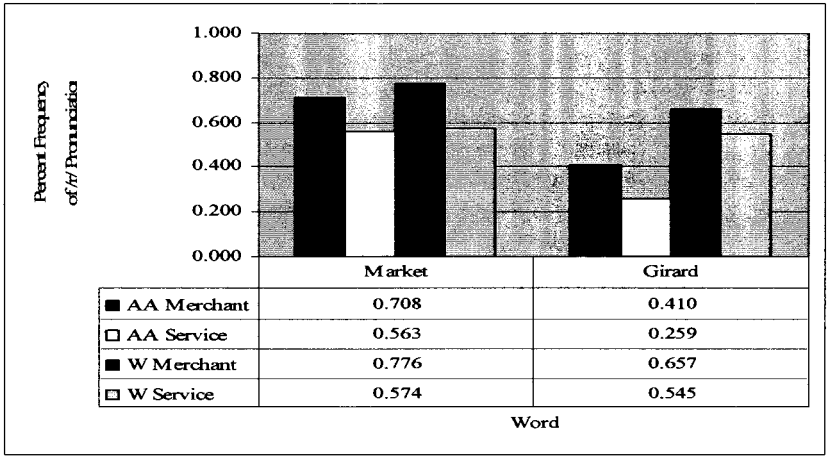
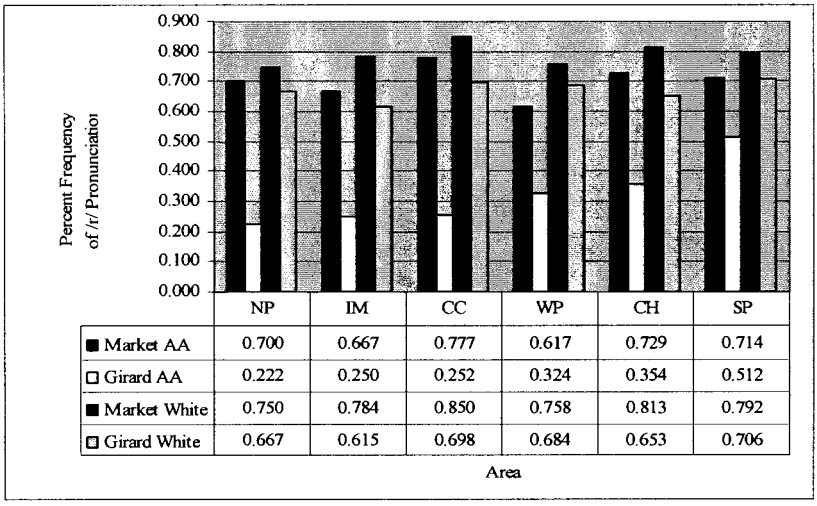


Figure 6: /r/ pronunciation by local status

The final factor examined was "specific area within Philadelphia". For this, we split Philadelphia into six different areas: North Philadelphia, Italian Market, Center City, West Philadelphia, Chestnut Hill, and South Philadelphia. We looked for patterns based on the demographic profiles of each area, anticipating that areas with larger African American populations, like North Philadelphia and Center City, would show larger differences in /r/ vocalizations. This does appear to be the case, but the area data showed other interesting patterns as well (see Figure 7).

In South Philadelphia, the difference in rate of vocalization of *Market* and *Girard* is much smaller than usual (only 20.2%, compared with an overall 36.7%). This is perhaps because African Americans in South Philadelphia are influenced by the Italian population there, who pronounce /r/ in *Girard* 12.1% more frequently than African Americans in our data. Area does appear to be a factor in /r/ vocalization patterns. People who live in areas of high or low /r/ vocalization patterns will adopt those patterns, strengthening or softening the effects of ethnicity. Hinton and Pollock (2000) found a very similar phenomenon in their study of two different areas: Davenport, Iowa and Memphis, Tennessee. They found that the general ethnicity of the population in an area is an excellent indicator of how much most residents, regardless of individual ethnicity, will vocalize /r/.



	NP	IM	CC	WP	CH	SP
■ Market AA	0.700	0.667	0.777	0.617	0.729	0.714
□ Girard AA	0.222	0.250	0.252	0.324	0.354	0.512
■ Market White	0.750	0.784	0.850	0.758	0.813	0.792
□ Girard White	0.667	0.615	0.698	0.684	0.653	0.706

Figure 7: /r/ pronunciation by area

For all areas except West Philadelphia, the pattern of highest to lowest /r/ pronunciation frequency was white *Market*, African American *Market*, white *Girard*, and African American *Girard*. The pattern in West Philadelphia was white *Market*, white *Girard*, African American *Market*, African American *Girard*. The results for West Philadelphia may reflect the influence of the standard-speaking white population of the University of Pennsylvania in this neighborhood.

3 Conclusions

This study of /r/ pronunciation and vocalization in Philadelphia produced some interesting results. We found that an internal factor interacts with an external factor, an infrequent occurrence according to linguistic records (Martinet 1955 and Kuryłowicz 1964, as cited in Labov 2001). Although all ethnicities are affected by dissimilation, African Americans show significantly more effects of dissimilation compared with all other ethnicities.

Over time, the difference in /r/ pronunciation between words that do have dissimilation and those that do not has grown. Dissimilating words show less /r/ pronunciation, and those without dissimilation show more /r/ pronunciation. From our age and gender graphs, we observe that women appear to be leading this change.

The issues raised in this study deserve further research and exploration. A rapid and anonymous study of /r/ vocalization similar to the one reported here is carried out every spring with researchers from the Introduction to Sociolinguistics class at the University of Pennsylvania. In future analyses, we suggest that new dissimilating words be added in order to test whether they show the same effects.

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