Factors Controlling the Acquisition of the Philadelphia Dialect by Out-of-State Children

Introduction

In recent years, linguists have returned to the study of the acquisition of language with a greater appreciation of the complexity of the task and the ability of the children who learn to speak. Most models of language acquisition are based upon the parent–child relationship; that is, on the process of the transmission of the basic input of speech patterns from parent to child (Brown and Bellugi, 1964; Bloom, 1970). These models have been useful, particularly in describing the earliest years of acquisition. However, they have not dealt with the broader social context of language learning.

The study immediately addresses the problem of determining the extent to which children of various ages acquire the phonological system of a second dialect after moving from one dialect region to a new one, as a way of exploring the general mechanism of language acquisition. These data suggest the answer to two further questions: first, whether a child freely reorganizes and/or restructures his grammar up to the age of 14; and second, whether a child will learn to speak like his peers or retain the system learned from his parents.

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LOCATING LANGUAGE IN TIME AND SPACE

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143
One of the major concerns of linguists is the writing of grammars that represent the underlying forms and rules that produce the structures used in speech. The approach most common today assumes that phonological syntactic rules are freely added to a child’s grammar and are continually reorganized in his grammar up to the age of 13 or 14 (Halle, 1962). However, there is another possibility that might have to be considered: that grammar is based upon forms acquired early in the process of language acquisition, say up to about age 6–8, and different rules are required for those forms which are acquired after the period of initial learning has stopped.

If a grammar is acquired in layers and sections at various ages, then a theory of grammar that stresses simplification from a single data base will not have the explanatory force that a grammar embodying the various levels of acquisition would have. If there are various stages and levels in acquisition, then linguists may find themselves writing grammars in which simple structures which are learned early are produced by one set of rules, and complex structures which are learned later, are produced by a different set of rules. This study provides an opportunity to examine what ability children have to reorganize, or add to, or to restructure their linguistic rules as new data are encountered. In particular, this study is concerned with a specific class of facts about the successful acquisition and development of the phonological and phonetic representations of the speech of children who have moved from one dialect region to another. The question is, how does one represent such change in underlying forms? In this study the term restructuring will be applied to any change in the dictionary representation of a morpheme; reorganization will be applied to indicate (a) “free insertion” of rules in the grammar; or (b) rule addition, that is, the addition of rules at the end of the grammar.

Sample Selection

The community selected for this study was a middle-class suburb of Philadelphia, Pennsylvania—King of Prussia. The community was selected because it provided the requisite independent variables; the study required (a) an area where there was one dominant dialect and many families from other dialect areas; (b) an area where children moving in had the opportunity of learning new dialect forms; and (c) a situation in which the parents’ dialect had a maximal opportunity of influencing a child’s linguistic acquisition. In King of Prussia (a) the local dialect details were well known; (b) at least 50% of the population was local; and (c) the nonlocal dialects were known to have high or neutral prestige.

King of Prussia is a bedroom community which has developed from a farming town into an industrial center since World War II. Many major companies such as General Electric, Western Electric, ITT, and General Motors are located in the area and are largely responsible for the influx of people. Exploratory methods indicated that 45% of the population was transient. The exploratory interviews also revealed that the local people in King of Prussia used a phonology and grammar indistinguishable from those of the central areas of Philadelphia and also that they were familiar with most of the local Philadelphia children’s games and lexical items.

During the course of the fieldwork a block-study method was used. Three types of blocks were selected, reflecting the different residential patterns of neighborhoods. The first type of block was called mobile, since it was usually found that the mobile community had children who had moved from one dialect region to another. The second type of block pattern, the mixed block, was defined as consisting of approximately half mobile families and half local families, where local meant that the parents and children had been born and raised within the Philadelphia dialect area. The third type was the local block, which consisted of primarily local families. At least 4 families on each block were interviewed. In order to assure a more accurate view of the influence of the residential composition of a block on acquisitional patterns, two of each type of block were located; that is, six blocks in all. In the mobile block, 3 out-of-state families and 1 local family were interviewed; in the mixed block, 2 of each type of family were interviewed; and in the local block, 3 local families and 1 out-of-state family were interviewed. Further control was introduced by selecting three types of families: (a) families with local-born parents and children; (b) families with local-born children and out-of-state parents; and (c) families with out-of-state-born children and parents. The second group provided a controlling factor for the comparison of parental influence versus peer group influence as the children in that group had spent their entire lives in the Philadelphia dialect area. A total of 24 families, half local and half out-of-state, with a total of 108 children, were interviewed. Over 450 hours of speech were recorded.

Initial contacts with families were made by approaching the children playing in the yards or streets. A number of scout and church leaders in the community gave generous cooperation and helped to identify and then contact families in blocks that met the requirements. In some cases the church supplied lists of names. The leaders of the Catholic church located all the families on one local and one mixed block.

Each child was asked to bring his best friend to his interview. This strategy was used in order to create a situation in which there would be close peer interaction (cf. John Lewis’s interviews of peer pairs in Labov et al., 1968). This in turn would result in the long periods of spontaneous speech needed for the analysis of the vernacular (Labov 1966, 1972a). The development of this strategy lengthened the average interview from about 40 minutes to about 2 hours of spontaneous speech. When the parents were interviewed together the interview lasted from 3 to 4 hours.
7. FACTORS CONTROLLING THE ACQUISITION OF PHILADELPHIA DIALECT

changes taking place in Philadelphia in the following vowels: (ahr), (ohr), and (oy). Spectrographic studies contributed toward understanding the linguistic processes responsible for the changes noted.

The profile of the Philadelphia/King of Prussia dialect that has been drawn from the most advanced features of the changes occurring in the dialect. The profile is a framework in which each variable is rated according to whether the child has acquired the Philadelphia norm, shows progress toward it, or does not have the Philadelphia norm. The following variables are considered as diagnostic of the Philadelphia/King of Prussia profile:

1a. (ə): The class of short a is split into a tense and a lax set under a complex series of conditions which will be further discussed.

1b. (əh): The tense set of (əh) is raised to the level of [a:] and to [a].

2. (aw): The nucleus of (aw) is fronted at least to [æ] and may be fronted to [e], and even [i]. The direction of the glide is phonetically toward [n] instead of [u].

3. (ay): The nucleus of (ay) is centralized before vocalic conti- nuents and then often backed to [o] or fronted to [i].

4. (ohr): (ohr) is raised to the level of (uh), which is [a:].

5. (oy): The nucleus of (oy) is raised to [u].

6. (uw) and 7. (ow): The nuclei of (uw) and (ow) are in the process of extreme fronting and centralization except where greater advances in free position.

8. (er): Finally, in pairs such as merry–Murray and ferre, the nuclei of the er class are merging with those of [ar].

Three to eight tokens of each of the variables were taken, except for the members of the class of (aw). This variability was transcribed. Spectrographic studies were part of a continuum in the short-a pattern.

The two basic questions considered were:

1. What are the types of rules out-of-state children follow when they move to Philadelphia?

2. What are the social factors that might hinder the child's acquisition of the new dialect?

First, both of these questions are examined in relation to the profile of the five phonetic variables—(aw), (ay), (uw), (ow), and (er).
Figure 7.2 shows the basic pattern for social influence on acquisition of language in terms of age moved and current age, and it displays the three main areas of experience that are significant to a study of this nature. The horizontal axis shows the age at which a child entered the community; the vertical axis shows the age of the child at the time of the interview. Area 1 is the period of early acquisition under parental influence, the age during which the child is beginning to learn language, and the primary stage of language acquisition. Some parental influence on specific dialect rules is assumed; however, the extent and period of this influence has not been determined conclusively. This uncertainty is indicated by the wavy lines in Figure 7.2. Area 2 is the formulation of a dialect under maximum King of Prussia influence. This area includes children born in King of Prussia and raised there during the period of consolidation of their dialects under peer influence. Area 3 includes children reorganizing their dialects under King of Prussia influence. It is here that the children who have moved in from another dialect area and who have spent only part of their lives in King of Prussia are found. This area is the one of most interest for this study, as it is here that one can examine what happens to children who first learn to speak in a different dialect area and then apparently begin to speak differently when exposed to the influence of new peers.

Phonetic Variables

In this study there are 12 out-of-state families from various dialect regions: 3 families from New York City (Morgan, Baker, and Miller); 3 families from Massachusetts (Martin, Kelly, and Douglas); 1 family from upstate New York (Hunter); 1 family from upstate Pennsylvania (Jackson); 1 family from Western Pennsylvania (Burk); 1 family from Cleveland (Cameron); and 1 family from Kansas (Barnes). With the diversity of the dialect backgrounds represented in the data, it is necessary to determine if any of the phonetic and phonological variables of the Philadelphia dialect are phonetically realized in the same manner in any of the out-of-state dialects. Table 7.1 displays the relevant patterns (Johnson, 1971; Kurath and McDavid, 1961; Labov, 1974; Labov, Yaeger, and Steiner, 1972). The five phonetic and three phonological variables are located on the vertical axis. If a given variable is phonetically realized in the same manner in the Philadelphia and the out-of-state dialect a plus (+) is used, if the variable is not the same a minus (−) is used; if there is insufficient information available a question mark (?) is used. Evidence for these decisions is given in the references cited.

As not all of the dialects are totally different from the Philadelphia dialect for all of the variables, a rating of overall success in acquisition for each variable is based upon the total number of children whose original dialect did not realize the Philadelphia variable in the same way. For example, children from New York City realize (aw) as [æ̃], which is the same as the base position of Philadelphia (aw). Children from Western Pennsylvania front and raise the nucleus of (aw) as high [e] and often lower the glide. As this overlaps with the pattern of many Philadelphia speakers, these out-of-state children are not included in the count of how many children have

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3 The names of the families have been changed to respect confidentiality.
acquired that Philadelphia variable. The same situation holds true for children from Scranton and Western Pennsylvania in the fronting of the nuclei of (ow) and (uw). As moderate to extreme fronting is already present in their dialects for the nuclei of these two variables, they are not included in the tabulations on acquisitions of (ow) and (uw).

The overall results of the investigation of learning of the five phonetic variables are given in Table 7.2 for natural speech. The variables are listed across the top of the tables and the three rows show categories for degree of learning:

1. ACQUIRED—The child has acquired the Philadelphia variable in a way that matches local patterns.

2. PARTIALLY ACQUIRED—This indicates that although the child uses the Philadelphia variable part of the time, he also uses the non-Philadelphia variable part of the time. For example, for the variable (ay*), a child who has partially acquired the Philadelphia norm may pronounce the word fight as [fait] part of the time and [fay] the rest of the time.

3. NOT ACQUIRED—The child has not acquired the variable at all.

The overall percentages of acquisition were determined by taking the total number of children who could acquire a given variable and dividing that into the total number of children who acquired, partially acquired, and did not acquire that given variable.

Looking at Table 7.2 one of the most striking results is the high percentages in the categories “acquired” and “partially acquired” compared to the very low percentages in the category “not acquired.” With the exception of (aw), each variable has been completely acquired by 50% or more of the children, and very few children have failed to acquire the pattern at all. The variable (aw) alone shows a moderate percentage for nonacquisition.

One question that arises immediately is why the out-of-state children show less success in learning (aw) than (uw), (oy), and (ay*). To answer this question, it is first necessary to understand the relationship of the various variables to each other and the changes they have undergone.

In the case of (uw) and (ow), there are various reasons, both linguistic and social, why these variables are easily acquired. The extreme fronting and centralization of (uw) and (ow) except before /l/ in Philadelphia goes far beyond the subtle distinction found among the allophones in other dialects. Yet, other studies (Kurath and McDavid, 1961; Labov, 1972; LYS 1972; Johnson, 1971) show that there is a slight to moderate fronting tendency already present in many dialects. Thus, there is available in many speakers’ dialects a rudimentary distinction, however slight, between the fully backed allophones of /uw/ and /ow/ before /l/ and their allophones in other environments. In this way the acquisition of the precise Philadelphia norms is a relatively easy task. In view of these facts, (uw) and (ow) are probably not as likely to be stigmatized by nonlocal speakers.

A similar situation exists for (ay*). In the pronunciation of such pairs of words as right and ride and sight and side, there is, in almost all dialects, a subtle distinction between the allophone that occurs before voiceless consonants and the allophone that occurs before voiced consonants. In Canada, the Upper South, and Martha’s Vineyard it is a very marked distinction. In Philadelphia this distinction is even more exaggerated among younger
speakers producing the centralized nucleus [a:]. This shifts back for some speakers to [a] and front for others. Again, if the distinction is present in other dialects, the basis for the formation of the rule is greatly facilitated.

A slightly different situation obtains for (oy). There are at least two main factors involved. First, there are very few words in the (uy) word class; if functional factors are effective as an out-of-state child begins to raise the nucleus of (oy) to the height of (uy), there are few words with which the (oy) words would become homophonous and cause confusion. Second, the chain shift that is merging (oy) and (uy) in Philadelphia is taking place in other dialects, and it seems reasonable to assume that unless there is strong negative stigmatization in the first dialect, speakers would not show a quick acquisition of the new forms.

The conditions under which /aw/ becomes [a\textsuperscript{a}] have deeper historical roots than those of the other phonetic changes discussed. First of all, the fronting of the nucleus of /aw/ in Philadelphia and in other dialects clearly represents a continuation of the nucleus glide differentiation begun in the Great Vowel Shift, during which Middle English /u:/ became [a\textsuperscript{a}], which in the majority of Standard English dialects is represented by [a\textsuperscript{a}]. It does not seem unreasonable to assume that independent developments elsewhere in the vowel system are necessary in order for the fronting of /aw/ to proceed. Specifically, it would seem, first, that this is a response to the fronting of the nuclei of /uw/ and /ow/ and, second, that there would also be a tendency for the nucleus of /aw/ to be identified with the tensing and raising of short a. Assuming /uw, ow, aw/ are an integrated subsystem, changes affecting the first two members of this class might be expected to operate eventually on /aw/. In this way, the fronting of the nucleus of /aw/ can be interpreted as a generalization of the environment in which the fronting operates:

**Rule 1**

\[
\begin{bmatrix}
- \text{low} \\
- \text{back} \\
+ \text{voc} \\
- \text{cons}
\end{bmatrix} \rightarrow \begin{bmatrix}
- \text{cons} \\
+ \text{back}
\end{bmatrix}
\]

**Rule 1'**

\[
\begin{bmatrix}
+ \text{voc} \\
- \text{cons}
\end{bmatrix} \rightarrow \begin{bmatrix}
- \text{voc} \\
- \text{cons} \\
+ \text{back}
\end{bmatrix}
\]

In any case, although these may be necessary conditions for the fronting of the nucleus of /aw/ to take place, they are probably not sufficient for it. There are dialects that have fronted variants of both /uw/ and /ow/, [e:\textsuperscript{a}] for some of the allophones of /ae/, and still do not have [a\textsuperscript{a}].

Moreover, the broad phonetic transcriptions used here do not reveal the fact, as found by the research project, that the glide segment of /aw/ is shifting to a low or lower-mid back glide; that is, to [a]. This unusual phonetic character of /aw/ may make acquisition more difficult.

Another factor that may affect the success of acquisition of (aw) and (ay\textsuperscript{O}) is that both of these variables are new changes in progress which are not complete. Subjective reaction tests administered to native Philadelphians by the research project reveal that the speakers are less sensitive to the newer changes and show little correction.

The notable success of the out-of-state children in acquiring the Philadelphia phonetic variables is consistent with the observation that these variants can be added to the grammar by simple rule addition. Labov (1974, pp. 41-42) gives three rules for adding (uw), (ow), and (aw), and (ay\textsuperscript{O}) to the grammar of a New York City speaker.\textsuperscript{5} Rule 2 insures that all diphthongs with lax vowels and upgliding back glides will be fronted. This separates (uw) and (ow) from the category of back vowels. When (uw) and (ow) occur before /l/, they are ingliding with a central glide and are not affected by Rule 2.

**Rule 2**

\[
[-\text{low}] \rightarrow [-\text{back}] / \quad [-\text{cons}] \\
+ \text{back}
\]

Rule 3 is an extension of Rule 1. It fronts /aw/ to approximately the same position as [a\textsuperscript{a}].

**Rule 3**

\[
[+\text{low}] \rightarrow [-\text{back}] / \quad [-\text{cons}] \\
+ \text{back}
\]

Rule 4 centralizes any nucleus of a diphthong and removes it from the category of low vowels when it occurs before voiceless consonants. This rule applies only to (ay\textsuperscript{O}).

\textsuperscript{5} Rules 2, 3, and 4 are given in a slightly different form in Labov, 1974.

1. Labov's rule 1 \(\rightarrow\) Rule 2

\[
[-\text{tense}] \rightarrow [-\text{back}] / \quad [-\text{cons}] \\
+ \text{back}
\]

2. Labov's rule 2 \(\rightarrow\) Rule 3

\[
[+\text{low}] \rightarrow [-\text{back}] / \quad [-\text{cons}] \\
+ \text{back}
\]

3. Labov's rule 3 \(\rightarrow\) Rule 4

\[
[-\text{tense}] \rightarrow [-\text{low}] / \quad [-\text{cons}] \\
+ \text{tense}
\]

\[
+ \text{son}
\]
RULE 4

\[ [+\text{low}] \rightarrow [-\text{low}] / - \begin{array}{c} -\text{cons} \\ -\text{back} \\ +\text{tense} \\ -\text{son} \end{array} \]

These rules represent the simplest alternation that would be necessary to bring a New York City or a non-Philadelphian vowel system into alignment with the Philadelphia system. But, if a child makes these alignments, is reorganization or restructuring taking place? Taking (ay*) as an example, how do we account for the success of the out-of-state children in acquiring (ay*)?

On the one hand, some structural analyses would claim that if /pat/ and /pat/ are a phonemic pair, the /a/ and /a/ are distinct everywhere else, including their occurrences in complex nuclei. This would not be considered to be ordinary phonetic change. They would claim that the native speaker hears the two sounds as different and, therefore, does not identify [ai] and [ai]. On the other hand, in a generative analysis there is no phonemic difference corresponding to [ai] and [ai]. Instead one finds that what is occurring is an allophonic change and not a phonemic change. The subjective reactions, the speaker's attitudes, and the continuous variation in Philadelphia lead one to accept the latter of these two treatments. Therefore, all (ay) words would be written as /ay/ in the lexicon and a rule would be added on the grammar to apply under the given conditions.

Age of Arrival


Further inquiries in King of Prussia involved a search for patterns of socialization and schooling. The emerging data suggested a practical grouping of the ages as follows: 0-4 years, 5-9 years, and 10-14 years. In Table 7.3 the age divisions are used to summarize the effect of age and to give the results for the percentage of children who acquired a given variable for natural speech. The data reveal that the tendency appears to be that the earlier a child moved to King of Prussia the more successful he was in acquiring the Philadelphia phonetic variables. (See Appendix A for the statistical results on the data in Table 7.3 using chi squares).

Although the age at which the child moved to King of Prussia appears to have an effect upon the degree of acquisition of the phonetic variables, it is also important to determine the possible effect on acquisition of the number of years a child has lived in King of Prussia. Table 7.4 shows the percentage of acquisition of the phonetic variables according to the age a child was when he moved to King of Prussia and the number of years lived in King of Prussia—4-7 years or 8-16 years. Further subdivisions of years lived in King of Prussia were not made as the number in the cells would have become too small. The groupings for the age at which the children moved to King of Prussia were set so as to correspond to changes in a child's school-and related social-statutes. Thus, 0-4 corresponds to the pre-school years, 5-8 corresponds to kindergarten through third grade, and 9-13 corresponds to the grades up to high school. The percentages were derived by dividing the total number of variables acquired by the children in each cell by the total number of variables which could be considered. The results indicate that children born and raised in King of Prussia, or those who moved to the area by the age of 4 and who have lived in King of Prussia for anywhere between 4 to 16 years, and children who have lived in King of Prussia for 8-16 years and moved between the ages of 5 and 8 have approximately the same degree of success in acquiring the Philadelphia phonetic variables. Children who moved to King of Prussia between the ages of 5 and 8 and who have lived in
TABLE 7.4  
The Percentage of Acquisition of the Phonetic Variables by OOS\(^a\) Children According to the Number of Years Lived in King of Prussia and the Age Moved

<table>
<thead>
<tr>
<th>Number of children</th>
<th>Age moved to area</th>
<th>Years lived in area</th>
<th>Variables</th>
<th>Number acquired</th>
<th>Number of variables</th>
<th>Percentage acquired</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9-13</td>
<td>8-16</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>9-13</td>
<td>4-7</td>
<td>8</td>
<td>24</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5-8</td>
<td>8-16</td>
<td>9</td>
<td>13</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>5-8</td>
<td>4-7</td>
<td>13</td>
<td>23</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0-4</td>
<td>8-16</td>
<td>24</td>
<td>36</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0-4</td>
<td>4-7</td>
<td>11</td>
<td>17</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>

\(N = 33\)

* Out-of-state.

the area for only 4-7 years show a slightly less degree of success of acquisition.

The Short-\(a\) Patterns

Unlike the phonetic variables, the Philadelphia short-\(a\) pattern cannot be incorporated into the grammar by simple rule addition at the end of the grammar, as there are several serious structural consequences involved in the acquisition of the short-\(a\) pattern. The success that the out-of-state children have in acquiring the core pattern of the Philadelphia short \(a\) provides an important insight into the ability of children to recognize and/or restructure their dialects as they are exposed to new data; a child needs to learn not only the phonetic conditioning of the short-\(a\) distribution (represented in what follows by Rule 5), but also the grammatical conditioning and lexical exceptions.

Four general types of short-\(a\) patterns in Eastern United States dialects and the distribution of the allophones of short \(a\) (Labov, Yaeger, and Steiner, 1972; Labov, 1974) are displayed in Figures 7.3A-7.3D. Figure 7.3A is the pattern in which the allophones of \(\text{æ}a\) have remained lax in all environments and show no major variants. Figure 7.3B is the pattern of a nasal dialect in which the allophones have a bimodal distribution: That is, \(\text{æ}a\) is raised and tensed before nasals and lax elsewhere (Laferriere, 1974). Figure 7.3C is a complex distribution of the variable \(\text{æ}h\) and residual \(\text{æ}a\) which is the pattern found in both the New York City dialect and in the Philadelphia dialect.

In these dialects there is some degree of surface contrast between \(\text{æ}^e\) and \(\text{æ}\). The issue as to whether \(\text{æ}h\) is a separate phoneme is left open. Figure 7.3D represents the pattern for the Northern City dialects. In this case all the allophones of the short-\(a\) class are raised and tensed and \(\text{æ}a\), if it exists at all in the system, is a front allophone of short \(o\).

The foregoing data which have been tabulated suggest that a critical turning point in the ability to acquire the Philadelphia dialect features occurs at about age eight. The findings also reveal that children are strongly influenced by their peers even when parental influence is maximal.

How does one account for the differences in the phonetic patterns in the speech of the children who arrive after the age of eight? Parental influence is one possible source for the deviations since the older children have been exposed to the speech of their parents for longer periods of time than have their younger siblings. But as these data and other studies indicate, the effect of the parents' influence seems to diminish as children grow older. A more probable explanation is that, as a child grows older, he has less ability to reorganize freely the linguistic patterns he acquired early under the influence of both his parents and out-of-state peers. The result is a mixture of the child's first dialect and the Philadelphia dialect.
Although New York City and Philadelphia are represented by the same schematic Figure 7.3C, the distribution of the short a is different for each dialect. The central core of the short-a pattern in Philadelphia might be formalized as follows:

**Rule 5**

\[
\begin{align*}
+\text{low} & \rightarrow [+\text{tense}] / [-\text{weak}] \quad \left\{ \begin{array}{l}
[+\text{ant}] \\
[-\text{nas}] \\
[+\text{cont}] \\
[-\text{voice}] \end{array} \right\} \\
\# \\
\end{align*}
\]

This rule states that the short a becomes tense when it is not in a weak word, and is followed by a front nasal (e.g., man, ham, hand), or a front voiceless fricative (e.g., glass, laugh, path), and this is followed by either an inflectional boundary or another consonant. There are two major exceptions to this core rule. First, three lexical items that do not meet the standard description of this rule undergo tensing and raising in Philadelphia—that is, the three affective adjectives with final d—mad, bad, glad (henceforth mbg). The other d words (e.g., cad, dad and fad) have lax nuclei. Second, three strong verbs that end in nasals and therefore should meet the structural description of Rule 5—ran, swam and began—have not undergone tensing and raising.

This represents only the bare outline of the short-a distribution. The other details are so complex that it must be problematic that people actually do produce the two sets of vowels by a rule, as there are many categories that require specific grammatical and lexical knowledge.

When one examines the Philadelphia short-a pattern in more detail, four general subpatterns emerge:

1. In the core pattern of Philadelphia, /æ/ is invariably raised and tensed when it occurs in the following environments:
   a. _N^+V_ (i.e., before front nasals followed by another consonant or an inflectional boundary—except for ran, swam, began, wan)
   b. _F^+V_ (i.e., before front voiceless fricatives followed by another consonant or an inflectional boundary)
   c. mbg (i.e., in the three affective adjectives in which short a precedes d)

2. In the following environments, /æ/ is invariably lax:
   a. auxiliary (e.g., am, can), verb
   b. _S^+V_ (i.e., before all voiceless stops)
   c. _S^+V_ (i.e., before all voiced stops except mad, bad, glad)
   d. _F^+V_ (i.e., before all voiced fricatives)
   e. _r^+V_ (i.e., before all voiced fricatives)
   f. _r^+V_ (i.e., before all voiced fricatives)
   g. _r^+V_ (i.e., before all voiced fricatives)

3. On the other hand, /æ/ is found to be variable when it occurs:
   a. _N(+)V_ (i.e., before a nasal consonant followed by an optional derivational boundary or by a vowel—for example, hammer, manage)
   b. _F(+)V_ (i.e., before front voiceless fricatives followed by an optional derivational boundary or by a vowel—for example, half, graphic)
   c. _l/ (i.e., pal, personality)

4. Furthermore, /æ/ is variable in proper nouns and abbreviations.

The Philadelphia core short-a pattern is included within the New York City short-a pattern. A core rule for New York City can be roughly formalized as follows:

**Rule 6**

\[
\begin{align*}
+\text{low} & \rightarrow [+\text{tense}] / [-\text{weak}] \quad \left\{ \begin{array}{l}
[+\text{nasal}] \\
[-\text{back}] \\
[-\text{voice}] \end{array} \right\} \\
\# \\
\end{align*}
\]

In other words, /æ/ goes to [æ] before front nasals, voiceless fricatives, and voiced stops, when these are followed by an inflectional boundary or another consonant. The environments in which /æ/ is tensed and raised in Philadelphia are thus a subset of those in which it is tensed and raised in New York City.

A closer examination of the New York City short a also reveals that the distribution is not without variation. Paul Cohen (1970) carried out a study of the tensing and raising of short a in New York City and found “inherent variability” in several classes (see Chapter 3, pp. 63–70, for details).

**Acquisition of the Philadelphia Short-a Pattern**

Now the question arises, how can one determine if the Philadelphia core rule is being learned and how much of it is learned at any point in time? For New York City children, the percentage of learning of the Philadelphia pat-
tern ($L^p$) can be calculated as follows: First it is necessary to consider the degree of laxing in that part of the short-α pattern which is tense in New York City ($N^c$); that is, short-α words that are lax in Philadelphia but tense in New York City (e.g., smash, dad, tag). If one then subtracts from $N^c$, the percentage of laxing in that part of the Philadelphia pattern which is tense, $P^c$, one obtains that percentage of laxing ($L^p$) which is the learning of the Philadelphia pattern for the New York City children.

$$L^p = N^c - P^c$$

This procedure separates the effects of irregular social correction from the systematic learning of the Philadelphia short-α rule. One may argue that the New York City forms are more stigmatized than the Philadelphia forms. That effect, however, is precisely what is meant by "learning the Philadelphia pattern"; that is, the New York City children learn to correct only those short-α words that are tense in New York City and not the tense short α in Philadelphia.

**Acquisition of Short a by New York City Children**

There are two general questions that apply to all out-of-state speakers trying to learn the Philadelphia short-α pattern:

1. What is/are the actual stages for reorganization?
2. Does the age at which a child moves to King of Prussia affect his ability to acquire the short-α pattern?

New York City children have two basic parts of the Philadelphia core rule to learn:

1. They must learn to retain a tense short a for the class of front voiceless fricatives, /s/, /ʃ/, and to lax short a before /ʃ/.
2. They must learn to lax short a before d except for the three affective adjectives, mad, bad, glad.

If the feature system used in writing phonological descriptions represents the simplest one-to-one correspondence of description of rules and if people actually make use of these features to learn, then one might predict that the New York City children will have more success learning to lax short a before /ʃ/, as this requires a generalization of a rule to exclude back voiceless fricatives, whereas the learning of mbg requires some special diacritic in the dictionary to mark exceptions to the blocking rule.

The percentages of learning ($L^p$) of the core Philadelphia short-α pattern by New York City children are given in Table 7.5 for natural speech. Table 7.6 gives the actual numbers upon which the percentages in Table 7.5 were calculated. These children give evidence of a wide but uneven spectrum of
TABLE 7.6
The Percentage of Tensing of Short a for Twelve NYC Children in Natural Speech in the Environments /s,f,θ/, /s/, mbg, /d/

<table>
<thead>
<tr>
<th>Name</th>
<th>Age moved/</th>
<th>No. tense/total tokens = percentage tense</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>age at time of study</td>
<td>/s,f,θ/</td>
</tr>
<tr>
<td>Bob Baker</td>
<td>9/20</td>
<td>12/12 = 100</td>
</tr>
<tr>
<td>Ken Baker</td>
<td>7/18</td>
<td>43/43 = 100</td>
</tr>
<tr>
<td>Matt Baker</td>
<td>4/15</td>
<td>13/13 = 100</td>
</tr>
<tr>
<td>Tom Baker</td>
<td>2/13</td>
<td>3/5 = 100</td>
</tr>
<tr>
<td>Don Baker</td>
<td>6/10</td>
<td>10/10 = 100</td>
</tr>
<tr>
<td>Mark Miller</td>
<td>11/15</td>
<td>27/44 = 61</td>
</tr>
<tr>
<td>Regina Miller</td>
<td>9/13</td>
<td>17/21 = 81</td>
</tr>
<tr>
<td>Theresa Miller</td>
<td>4/8</td>
<td>17/21 = 81</td>
</tr>
<tr>
<td>Richard Morgan</td>
<td>8/13</td>
<td>42/44 = 95</td>
</tr>
<tr>
<td>Liz Morgan</td>
<td>6/11</td>
<td>12/19 = 63</td>
</tr>
<tr>
<td>Danny Morgan</td>
<td>5/10</td>
<td>32/33 = 97</td>
</tr>
<tr>
<td>Mike Morgan</td>
<td>3/8</td>
<td>13/17 = 76</td>
</tr>
</tbody>
</table>

The success of learning of the children? First, we must determine the starting point for the New York City children and where the Philadelphia target is in relation to their starting point.

Figure 7.4 displays the specific results for /s,f,θ/ versus /s/. In this scattergram the percentages of tensing for /s,f,θ/ are located on the horizontal axis and those for /s/ are given on the vertical axis. The children from New York City begin approximately 100% tensing of short a before /s,f,θ,s/. They are striving to reach the Philadelphia pattern at lower right which is 100% tensing before /s,f,θ/ and 0% before /s/. In Figures 7.4 and 7.6 the point of origin (O) of the lines is not 100%—100% for all the speakers, as correction occurs within the core Philadelphia pattern which is shared by the New York City children (see Figure 7.5). In order to display the actual amount of learning of the Philadelphia pattern for each child, the lines begin from a starting point defined by the amount of tensing of the core Philadelphia–New York City short-a words. For example, in Table 7.5 we see that the amount of learning patterns. One salient in Table 7.5 emerges: the acquisition of short a by most of the New York city children is low. The two exceptions are Terry Miller [4 (years when moved)/8 (years at time of study)] who has learned 83% of the short-a pattern and Regina Miller (9/13) who has learned 75% of the pattern.

Table 7.5 shows that the Baker family appears to have learned virtually none of the Philadelphia short a with the exception of Donald (0/10), who has learned only a little. Laxing has been overgeneralized. This is somewhat surprising considering that the Bakers have lived in King of Prussia for 11 years, which is longer than either of the other two New York City families have lived there, and that all but Bob moved before the age of 8.

The Millers show the highest percentages of learning of the three families. The children follow an expected pattern in which the oldest child, Mark (11/15), shows the lowest percentage of learning; the middle child, the next lowest percentage; and the youngest child has acquired the most.

The Morgan family shows some acquisition of the Philadelphia short-a pattern, but the children do not follow a regular increase in percentage of learning from the oldest learning least to the youngest learning most.

In order to obtain a clearer picture of the degree of learning of the short-a pattern by the New York City children, the figures have been plotted in scattergrams which show the progress in the acquisition of the two major generalizations—that is, learning to lax short a before /s/ and before /d/ in natural speech. One question that arises is, how do the scattergrams display...
correction in the Philadelphia core (P) for Mark Miller (P1) is 17%. His point of origin for learning is then 100% = 83% = 17% in both environments. From this point a vertical line extending downward or angling to the right would represent learning entirely targeted on the Philadelphia pattern, whereas a line extending diagonally to the left represents no orientation towards the Philadelphia /s,f,θ/ versus /$/$ distinction, since it treats them as equal. Thus, an angle of $\alpha \approx 45^\circ$ would represent complete overgeneralization and loss of the target, whereas $\alpha \approx 0^\circ$ is no overgeneralization, but accurate and efficient learning of the Philadelphia pattern.

Figure 7.6 displays the results for the learning by New York City children to lax tense short $a$ for all /$d$/ words except $mbg$. The percentage of timing for $mbg$ is given on the horizontal axis and the percentage of timing for /$d$/ is found on the vertical axis. Again the New York City children are seen as shifting toward the Philadelphia pattern in the lower right corner of 100% timing of $mbg$ and 0% for all other $d$ words.

A comparison of the two scattergrams (i.e., Figures 7.4 and 7.6) reveals the striking difference in the results of the success of the New York City children in learning to lax tense short $a$ before /$d$/ and before /$/$. It can be clearly seen that the New York City children show, contrary to what was expected, a much greater success in learning to lax tense short $a$ before /$d$/ than before /$/$.

The difference becomes more apparent with closer examination of the direction in which the lines and the value of alpha move. For $mbg$ there is a tendency for almost all of the lines to be angled in the direction of the Philadelphia target with $\alpha \approx 0^\circ$. However, for /$/$, the lines, although moving downward, are not angled in the direction of the Philadelphia target, but rather they tend to angle slightly toward a general laxing of all four classes—/$s,f,\theta,\theta$/; that is, $\alpha \approx 0^\circ$. Thus, it appears that for the New York City children, the lexical contrast of $mbg$ with the other $d$ words seems to help in learning and is actually easier to learn than the simple laxing rule laxing [Æ] before /$/$, which is a simple generalization.

Perhaps one reason the $mbg$ pattern seems to be more easily learned is that the three emotive adjectives occur more frequently in everyday speech than other $d$ words. The frequency of occurrence also seems to affect the percentage of laxing. For example, the word $dad$ is more likely to be in common use among children than, say, words such as $cad$ or $fad$.

**Acquisition of Short $a$ by Children from “Nasal Dialect” Areas**

The percentage of learning for New York City children could be determined by a simple formula as the Philadelphia short-$a$ core pattern fits within the New York City short-$a$ core pattern. However, the percentage of learning is not as easily determined for the children from Nasal and Northern City

---

9 This study will not include a detailed examination of each individual which would allow the effects of frequency to be tested; the data are stored in a form which would make such an examination possible and further studies of lexical learning are indicated. Other types of influence such as sibling, block, family, and age span are discussed in Payne, 1976.
areas. These two dialects do not share a core pattern with the Philadelphia dialect.

The short-a pattern for Nasal speakers can be described as:

\[
\text{Rule 7} \quad \left[ +\text{low} \right] \rightarrow \left[ +\text{tense} \right] / \left[ +\text{nas} \right]
\]

That is, in the Nasal dialect, short a is tensed and raised before all nasals in all environments including NV. Thus, Nasal speakers must learn three parts of the core Philadelphia short-a pattern. First, they must learn to raise and tense short a before the front voiceless fricatives, /s,f,θ,ə/, when followed by another consonant or inflectional boundary. Second, they must learn to raise and tense the nucleus of short a for the three d words, mad, bad and glad, while maintaining a lax nucleus for all other d words (such as sad, dad, fad). Third, they must learn to variably lax the short-a words that are variably lax in Philadelphia but tense in the Nasal dialect. That is, for Nasal speakers one is interested in the degree of laxing in those words in which short a precedes the sequence _NV (as in planet, manage, damage). However, in Philadelphia for the class of short-a words preceding the sequence _NV, the research project found lexical diffusion occurring. The word planet is usually raised and tensed for Philadelphians, although other words of this class are less frequently raised and tensed. The percentage of learning for Nasal speakers then, for the short-a words preceding the sequence _NV, must be determined on the basis of the percentage of laxing occurring in the class of short-a words preceding the environment _NV (minus the word planet).

That is, if a child shows 100% tensing for NV, then he has not learned the Philadelphia pattern. However, if a child only tenses short a in the NV category 25-30% of the time, then he has learned the Philadelphia pattern. If the problem of Nasal speakers is represented as a problem in rule learning these speakers must: (a) add a tensing rule for /s,f,θ,ə/; (b) mark mbg with some special diacritic feature in their dictionary which would include them in the tensing rule, and (c) add a lexically variable tensing rule for the category NV. One might anticipate a higher degree of success in learning (a) and (b), as the former requires the addition of phonetic rules and the latter requires marking only three words in the dictionary. To learn NV would require replacing a phonetic rule with a lexically conditioned variable rule.

The Nasal dialect speakers' percentages of learning patterns for natural speech \(^1^0\) are given in Table 7.7. The children had 100% tensing in the category _NV {ə} and, therefore, this category is not given in Table 7.7. The three categories in the tables are not averaged together due to the low number of tokens in the NV class for the Castle family.

\begin{table}
\centering
\caption{Table 7.7
Percentage of Tense Token of Short a in Natural Speech for Nasal Speakers in the Environments NV, /s,f,θ,ə/, and mbg}
\begin{tabular}{|c|c|c|c|c|}
\hline
Name & Age moved/age at time of study & No. tense/total tokens = percentage tense & Average tense/total of /s,f,θ,ə/ plus mad,bad,glad \\
& & NV & /s,f,θ,ə/ & mad,bad,glad \\
\hline
Max Barnes & 9/13 & 2/5 = 40 & 13/20 = 65 & 8/20 = 40 & 42 \\
Becky Barnes & 6/10 & 4/11 = 36 & 2/18 = 11 & 3/12 = 25 & 18 \\
Tina Castle & 0/14 & 2/2 = 100 & 0/7 = 0 & 0/5 = 0 & 0 \\
Rick Castle & 0/12 & 1/2 = 50 & 0/12 = 0 & 1/6 = 17 & 8 \\
Sam Castle & 0/11 & 1/1 = 100 & 0/9 = 0 & 2/13 = 15 & 6 \\
\hline
\end{tabular}
\end{table}

The data in Table 7.7 reveal that the Barnes children have had some success in learning the Philadelphia short a for both /s,f,θ,ə/ and mbg, and that the Castles show little or no learning. Both of the Barnes children show considerable learning of the NV patterns. No percentages are given for the Castles as the number of tokens is too small to reveal a distinct pattern, but the fact that Rick (0/12) has one tense and one lax token indicates that he has at least some variation in the NV category.

These results do not agree with any expectations of a correlation between years spent in King of Prussia and success in learning the (æh) pattern. The Castles have learned practically nothing, which is very unusual as they were all born and raised in the Philadelphia area. The Barnes show some learning, but it is about the same for all categories. The most important feature of the acquisition that has taken place is that only the Philadelphia pattern is learned—that is, there is no generalizing of the tensing to /s/ or to /b,d,g/. On the other hand, there is no differentiation of _NV and the other environments, all show about the same degree of tensing.

\textbf{Acquisition of Short a by Northern City Children}

The Northern City speaker approaches the learning of the Philadelphia short-a pattern with a different set of problems from the New York City or Nasal speaker as his system has tense short a in all environments. Thus, he must learn to

1. Retain tense short a before /s,f,θ,ə/, while learning to lax tense short a before /s/.
2. Retain tense short a in mbg, while learning to lax /æ/ before all other d words.
3. Learn to variably lax tense short a for the NV class 75% of the time.
4. Learn to lax tense short a when it precedes /b,g,/ and /p,t,k/.

\(^1^0\) For details on word lists see Payne, 1976.
Unlike Nasal speakers, who must add a tensing rule, the Northern City speakers must learn to add laxing rules. In this respect they face a situation similar to that of New York City children. If Northern City children attempt to use rules, these rules must block tense short a from occurring before /s/ and before /d/. At the same time they must mark the mbg lexical items with some special diacritic in the dictionary to exempt them from the laxing rule. Also, the children must learn to add a lexically conditioned variable rule to account for the NV class.

The results of acquisition of short a by Northern City speakers are given in Tables 7.8 and 7.9. Table 7.8 gives the percentages of tense/token for the occurrence of short a in the following environments: (a) /s,f,θ/; (b) /s/; (c) mbg; (d) /d/; (e) /b,g/ and /p,t,k/; and (f) NV. Table 7.9 provides the actual number of tokens. Table 7.8 reveals that 6 of the 17 children have succeeded in learning to retain a tensed and raised short a before /s,f,θ/ and to lax tense short a before /s/. Judy Kelly (6/17), Karen Cameron (8/15), Paul Jackson (4/16), Joanne (4/11) and John Hunter (8/15), and Bob Burk (0/13) all show 93–100% tensing of short a before /s,f,θ/ and 0% tensing of short a before /s/.

**Table 7.8**

<table>
<thead>
<tr>
<th>Name</th>
<th>Age moved/</th>
<th>/s,f,θ/</th>
<th>/s/</th>
<th>mad,bad, glad</th>
<th>/d/</th>
<th>/s,f,θ/ plus mbg</th>
<th>/b,g/ &amp; /p,t,k/</th>
<th>NV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Douglas</td>
<td>6/14</td>
<td>39</td>
<td>14</td>
<td>25</td>
<td>0</td>
<td>32</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Lisa Douglas</td>
<td>4/12</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>David Douglas</td>
<td>0/8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>David Martin</td>
<td>13/17</td>
<td>64</td>
<td>0</td>
<td>53</td>
<td>20</td>
<td>59</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Linda Martin</td>
<td>11/15</td>
<td>86</td>
<td>25</td>
<td>100</td>
<td>0</td>
<td>93</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Cindy Martin</td>
<td>9/13</td>
<td>11</td>
<td>---</td>
<td>88</td>
<td>75</td>
<td>50</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Judy Kelly</td>
<td>6/17</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Karen Cameron</td>
<td>8/15</td>
<td>100</td>
<td>0</td>
<td>93</td>
<td>0</td>
<td>97</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>Ralph Cameron</td>
<td>7/14</td>
<td>29</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>18</td>
<td>0</td>
<td>57</td>
</tr>
<tr>
<td>Joyce Cameron</td>
<td>4/11</td>
<td>10</td>
<td>0</td>
<td>22</td>
<td>0</td>
<td>16</td>
<td>0</td>
<td>47</td>
</tr>
<tr>
<td>Ellen Cameron</td>
<td>2/9</td>
<td>4</td>
<td>0</td>
<td>15</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>45</td>
</tr>
<tr>
<td>Paul Jackson</td>
<td>4/16</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>19</td>
<td>100</td>
</tr>
<tr>
<td>Dan Jackson</td>
<td>2/13</td>
<td>86</td>
<td>56</td>
<td>50</td>
<td>100</td>
<td>68</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>John Hunter</td>
<td>8/15</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>50</td>
<td>100</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Joanne Hunter</td>
<td>4/11</td>
<td>96</td>
<td>0</td>
<td>100</td>
<td>86</td>
<td>98</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>RaeLynn Burk</td>
<td>0/16</td>
<td>50</td>
<td>0</td>
<td>23</td>
<td>0</td>
<td>37</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Bob Burk</td>
<td>0/13</td>
<td>93</td>
<td>0</td>
<td>63</td>
<td>9</td>
<td>78</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

The other children have a strong tendency to lax tense short a before /s/, but they also display a strong tendency to lax tense short a before /s,f,θ/.

Figure 7.7 and 7.8 are scattergrams, which provide a more abstract view of the pattern of learning that has taken place in the speech of the Northern City children. The two basic categories of the Philadelphia short-a rule that must be learned are shown (i.e., /s,f,θ/ and mbg).

In Figure 7.7, the percentages for tensing of short a before /s,f,θ/ are located on the horizontal axis and those for /s/ are given on the vertical axis. The children from Northern City dialects begin with 100% tensing of short a before /s,f,θ,/. The goal is to achieve 0% tensing for /s/ and 100% tensing for /s,f,θ/. In Figure 7.8 the results for mbg versus /d/ are given with the percentages for mbg on the horizontal and for /d/ on the vertical. The goal is to achieve 0% tensing for /d/ and 100% tensing for mbg. These two scattergrams are interpreted in the same manner as were the scattergrams for the New York City children.

The angle of the lines in the scattergrams for natural speech for mbg and for /s/, provide, perhaps, the clearest display of the difference in the success the Northern City children have in learning the two different classes. In this case the expectations that were set forth for the ease of rule formation are
confirmed. The children seem to have less difficulty learning to retain a tense short a for only the front voiceless fricatives. The scattergrams show a less abrupt break or a finer gradation of shift in the learning patterns of the children. That is, even though there is a tendency to apply a general laxing rule, more children come closer to the Philadelphia target more often for /s/ (Figure 7.7) than when trying to learn the exceptions of mbg (Figure 7.8).

Tables 7.8 and 7.9 show that the Northern City children on the whole have been completely successful in learning to lax tense short a before /b, g/ and before /p, t, k/. Only three children have not completely succeeded. These results indicate that when the Northern City children are confronted with the Philadelphia pattern they tend to apply laxing rules across the board. For those parts of the Northern City dialect that are completely lax in Philadelphia (e.g., /p, t, k/), the Northern City children are very successful in learning to lax tense short a. However, when they must learn to block application of a tensing rule for only part of a class they are less successful. And, as was discussed, the Northern City children show a slightly greater degree of success in learning to lax tense short a for the whole class /s/, than they do for marking mbg with special diacritic features in the dictionary, which was expected.

The data for the learning of the Philadelphia pattern for short a in the category NV are also given in Tables 7.8 and 7.9. Except for the Cameroon, the Northern City children as a whole have not succeeded in learning the lexically conditioned variable pattern for NV.

One important finding that is very striking is that only one child, Karen Cameron (8/15), appears to have almost completely learned the Philadelphia short a. Judy Kelly (6/17) and Paul Jackson (4/16) have also been very successful in the acquisition of the short-a pattern. Judy has learned all of the short a except for laxing tense short a in the environment NV, and Paul, all except for the NV category and a few words in the voiced and voiceless stop categories. Otherwise, the children as a whole have been unsuccessful in learning the Philadelphia short-a pattern.
TABLE 7.10
Number of Northern City Children for Whom the Angle of Alpha is Greater or Less Than 22.5° for Variables mbg and /s,f,θ/ versus /β/

<table>
<thead>
<tr>
<th>Variable</th>
<th>&gt;22.5°</th>
<th>&lt;22.5°</th>
</tr>
</thead>
<tbody>
<tr>
<td>mad, bad, glad</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>/s,f,θ/ versus /β/</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>

Comparison of the New York City and the Northern City Children’s Learning Patterns

The contrast in learning patterns between New York City and Northern City children despite the similarity in tasks is immediately relevant to the fundamental issue of rule formations. Both groups of children overgeneralize.

A comparison of the difference in degree of success can be obtained from Tables 7.10 and 7.11 in which the angle of alpha is compared for mbg and /s,f,θ/ versus /β/. Recall that if α ≥ 45° then the child has completely overgeneralized. If α > 22.5° the child is showing a strong tendency to overgeneralize in attempting to learn the Philadelphia pattern. If α < 22.5°, then the child is aiming for the Philadelphia pattern. Tables 7.10 and 7.11 show the results for the Northern City and New York City children. Table 7.10 shows the results for the Northern City children. As can be seen the children show more of a tendency to acquire /s,f,θ/ versus /β/ and less acquisition of mbg. Table 7.11 shows the results for the New York City children. All of the children who showed learning reveal a high degree of success in aiming for the mbg pattern of Philadelphia and considerably less success in acquiring the /s,f,θ/ versus /β/ pattern. The individual angles for alpha are listed in Table 7.12 for natural speech.

TABLE 7.11
Number of New York City Children for Whom the Angle of Alpha is Greater or Less Than 22.5° for Variables mbg and /s,f,θ/ versus /β/

<table>
<thead>
<tr>
<th>Variable</th>
<th>&gt;22.5°</th>
<th>&lt;22.5°</th>
</tr>
</thead>
<tbody>
<tr>
<td>mad, bad, glad</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>/s,f,θ/ versus /β/</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

TABLE 7.12
The Degree of Alpha for Natural Speech for mbg and /s,f,θ/ versus /β/ for Northern City and New York City Children

<table>
<thead>
<tr>
<th>Children</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>/s,f,θ/ versus /β/</td>
</tr>
<tr>
<td></td>
<td>mad,bad,glad</td>
</tr>
<tr>
<td>Northern City</td>
<td></td>
</tr>
<tr>
<td>Judy Kelly</td>
<td>0°</td>
</tr>
<tr>
<td>David Martin</td>
<td>30°</td>
</tr>
<tr>
<td>Linda Martin</td>
<td>0°</td>
</tr>
<tr>
<td>Cindy Martin</td>
<td>25°30'</td>
</tr>
<tr>
<td>Bill Douglas</td>
<td>36°30'</td>
</tr>
<tr>
<td>Lisa Douglas</td>
<td>43°45'</td>
</tr>
<tr>
<td>Mike Douglas</td>
<td>45°</td>
</tr>
<tr>
<td>John Hunter</td>
<td>0°</td>
</tr>
<tr>
<td>Joanne Hunter</td>
<td>0°</td>
</tr>
<tr>
<td>Karen Cameron</td>
<td>4°</td>
</tr>
<tr>
<td>Ralph Cameron</td>
<td>43°</td>
</tr>
<tr>
<td>Joyce Cameron</td>
<td>37°45'</td>
</tr>
<tr>
<td>Ellen Cameron</td>
<td>40°</td>
</tr>
<tr>
<td>RaeLynn Burk</td>
<td>37°</td>
</tr>
<tr>
<td>Bob Burk</td>
<td>21°30'</td>
</tr>
<tr>
<td>Paul Jackson</td>
<td>0°</td>
</tr>
<tr>
<td>Dan Jackson</td>
<td>90°</td>
</tr>
<tr>
<td></td>
<td>N = 17, $\bar{X} = 26°60'$</td>
</tr>
<tr>
<td>New York City</td>
<td></td>
</tr>
<tr>
<td>Bob Cook</td>
<td>—</td>
</tr>
<tr>
<td>Ken Cook</td>
<td>—</td>
</tr>
<tr>
<td>Matt Cook</td>
<td>—</td>
</tr>
<tr>
<td>Tom Cook</td>
<td>—</td>
</tr>
<tr>
<td>Dan Cook</td>
<td>0°</td>
</tr>
<tr>
<td>Mark Miller</td>
<td>-5°30'</td>
</tr>
<tr>
<td>Regina Miller</td>
<td>10°45'</td>
</tr>
<tr>
<td>Theresa Miller</td>
<td>-8°30'</td>
</tr>
<tr>
<td>Richard Morgan</td>
<td>4°</td>
</tr>
<tr>
<td>Liz Morgan</td>
<td>-4°30'</td>
</tr>
<tr>
<td>Danny Morgan</td>
<td>14°</td>
</tr>
<tr>
<td>Mike Morgan</td>
<td>-1°</td>
</tr>
<tr>
<td></td>
<td>N = 16, $\bar{X} = 19.95°$</td>
</tr>
</tbody>
</table>
The Northern City children give every evidence of operating with phonetic rules in the following respects:

1. They have greater success in acquiring the simple rule of laxing only before back voiceless fricatives.
2. They have almost 100% success in laxing in environments where New York City is 100% lax.
3. They show further shifting towards generalization in word lists (see Payne, 1976).

New York City speakers reverse the pattern for (1) and have a weaker effect on (3); (2) is not applicable. For these reasons it appears that New York City speakers are more attuned to lexical factors than rule formation.

Conclusion

The Philadelphia short-a pattern provides us with an example of one of the most difficult tests for the acquisition of a local dialect. The issue crucial to linguistic theory whether (a) the Philadelphia system differentiates tense and lax a by rule and (b) the out-of-state children are attempting to use a rule to learn the Philadelphia short-a pattern.

The examination of the acquisition of the short a has revealed several significant findings:

1. The phonetic variables are acquired with greater ease than the short a.
2. It is in fact very rare for a child to acquire the Philadelphia short a.
3. Unless a child’s parents are locally born and raised, the possibility of his acquiring the short-a pattern is extremely slight even if he were to be born and raised in King of Prussia.

It was found that the children from the Northern City, Nasal, and New York City dialects have demonstrated differing degrees of success in acquisition of the Philadelphia short-a pattern and apparently different approaches. The data on the Northern City and New York City children provide the clearest example. The Northern City child whose short-a pattern falls in a continuum of detailed phonetic conditioning applies phonetic generalizations in his attempt to learn the Philadelphia short-a pattern. The fact that his short-a pattern is a rule governed continuum may make him more attuned to treating the word class as a unit rather than as individual lexical items. The only way we can explain learning patterns of the New York City children is through the complex conditioning of their short-a pattern. That is, because of not only phonetic conditioning but also the lexical and grammatical exceptions to the tensing of short a, the New York City children are more oriented toward learning words.

A comparison of the two types of variables—that is, the phonetic vari-

ables versus the short-a pattern—reveals that there are two different learning patterns.

Almost all of the out-of-state children show some learning of the Philadelphia pattern. The phonetic variables were acquired or partially acquired by almost all of the children. The age of arrival had the strongest effect on the success of acquisition, age 8 being the cut-off point. Acquisition of the short a was usually irregular, sporadic, and incomplete. The incomplete acquisition indicates that children do not freely restructure and/or reorganize their grammars up to the age of 14 but that they do have the ability to add lower level rules. Although parental influence is dominant in the learning patterns for the phonological variables, the acquisition patterns of the out-of-state children revealed not only that they were strongly influenced by their peers but also that they employ other modes of learning besides rule formation.

Appendix

<p>| TABLE 7.A.1 |
|-----------------|-----------------|-----------------|
| <strong>The Acquisition of (ay)</strong> According to the Age at Which a Child Moved to King of Prussia* |</p>
<table>
<thead>
<tr>
<th>Age</th>
<th>No. of subjects who acquired (ay)</th>
<th>No. of subjects who did not acquire (ay)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–4</td>
<td>11</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>5–9</td>
<td>7</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>10–14</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>N</td>
<td>18</td>
<td>16</td>
<td>34</td>
</tr>
</tbody>
</table>

* $X^2 = 4.66, p = .10$.

<p>| TABLE 7.A.2 |
|-----------------|-----------------|-----------------|
| <strong>The Acquisition of (aw)</strong> According to the Age at Which a Child Moved to King of Prussia* |</p>
<table>
<thead>
<tr>
<th>Age</th>
<th>No. of subjects who acquired (aw)</th>
<th>No. of subjects who did not acquire (aw)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–4</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5–9</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>10–14</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>N</td>
<td>8</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

* $X^2 = 3.74, p = .20$. 


Social scientists generally use a probability level of .05 or less when reporting "statistically significant" findings. The results of the chi square tests on the preceding data indicated no statistically significant difference based on age. However, the differences that do appear indicate that age is least important in the acquisition of (ow) and most important in the acquisition of (ay)*. The conclusiveness of the data is limited by the small size of the sample.

References


THE STRUCTURE OF A LONG-TERM PHONOLOGICAL PROCESS: THE BACK VOWEL CHAIN SHIFT IN SOU.LATAN GASCON¹

Introduction

The greatest recent breakthrough in the study of linguistic change has been the recognition that some variation found in the everyday use of language is itself historical change in progress. This provides us with the means to study historical change in vivo and thus to observe the inner workings of historical process. The development of variable rules has already shown that any change can be governed by a variety of variably weighted constraints, and that categorialness is not part of the definition of a linguistic rule. Variability cannot be set aside from the rest of linguistic phenomena—not only because it is systematic, but because it stands in a feedback relation with the rest of the system: It is the potential for variability in linguistic rules that allows the linguistic system to change systematically. Systematicity, in turn, can only be defined in terms of the patterns shown in variable rules. C.-J. Bailey (1972) has pointed out that "everyone always speaks what traditional dialectologists labeled a transitional dialect [p. 26]." In his insistence on a dynamic view of linguistic systems, he has built into his model of a grammar the obvious fact that change is built into language design. Thus any treatment of linguistic competence that ignores change, and any treatment of change that ignores the role of speakers' transitional competence, cannot answer many of the essential questions of linguistic theory.

¹ The research was supported in part by National Science Foundation dissertation research Grant NSF-GS-3211.