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ABSTRACT

This report discusses the results of a study of children's spelling errors to determine whether vernacular black English (VBE) speakers and standard English speakers (SE) infer different underlying phonological representations according to their respective dialects. Subjects included two groups of beginning second graders from schools in two contrasting cities. Spelling results were scored both by VBE homophonous pairs and by individual words. The study found that blacks spelled significantly more of the VBE homophonous word pairs identically than did whites. Word pairs were categorized as identical, similar, or different. Spellings of individual words were analyzed according to the following categories: (1) correct and phonetic; (2) dialectal; (3) hypercorrect/intrusive; (4) consonant; and (5) uninterpretable. The study is said to support the hypothesis that children who speak different dialects have different underlying phonological forms. (ML)

# Vernacular Black English and Underlying Phonological [illegible]: Evidence from Child Spelling



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The opinions and assertions contained herein are those of the author and are not to be construed as official or reflecting the views of the Department of the Army or the Department of Defense.

The study of Vernacular Black English (VBE) as a linguistic system has raised some questions about the underlying phonological representations of lexical items which differ in spoken form from standard English (SE). One interesting unresolved question is whether speakers of VBE have a different underlying form for those lexical items which differ in spoken form from SE or whether the underlying form is the same but the rules which govern output for SE are different. Many researchers have taken the position that the representations are the same for the two dialects but some of the rules which govern spoken output for VBE differ from the phonological rules of SE. This theory loses strength when language acquisition data are examined. Young children tend to use a greater percentage of dialectal features than adult speakers of the same dialect. Thus, the commonly accepted view that VBE begins with SE forms and applies rules to arrive at VBE output forms seems contradictory. Rather, it is more plausible to assume that VBE-speaking children infer underlying phonological representations that differ from those of SE, and they acquire additional rules later in life which allow them to increase their percentage of output of SE features.

In the present study, children's early spelling errors on supposedly homophonous words in VBE are analyzed to determine whether speakers of VBE and SE have inferred different underlying phonological representations according to the dialect they speak. From these results, implications are drawn for the understanding of VBE phonological acquisition and the acquisition of dialect variability.

In considering theories of phonological acquisition, it is interesting

to note the relationship of orthography to the phonological system and its effect on that system. Chomsky and Halle's (1968) pre-Vowel Shift underlying phonological representations were claimed to represent an orthography which optimally represented the pronunciation features of words (p. 54). Luelsdorff (1974) found no evidence to support these pre-Vowel Shift underlying representations in a fourteen-year-old speaker of VBE. He attributed this to the fact that this speaker was unfamiliar with those lexical items which manifest Vowel Shift alternations (e.g., vain - vanity, divine - divinity). Thus, there was no evidence from which this speaker would have incorporated either pre-Vowel Shift forms or the rule for shifting the underlying vowels.

Fasold (1969) maintains that if we suppose children learning a first language use evidence from orthographic alternations such as consist - resist (s-voicing intervocalically in the latter) and resemble - assemble (geminate consonants to indicate a voiceless sound in the latter), then presumably they will not acquire the competence described by these rules until learning the lexical items that show these alternations and realizing consciously how they are related to pronunciation (p. 75). Similarly, as a speaker of English learns latinate forms which exhibit Vowel Shift alternations, s/ must also learn that these forms are related. At this point, the underlying representations of the speaker may be adjusted to accommodate the relationship of these forms. It is hypothesized in this study that child speakers of VBE who are exposed to SE make similar adjustments in that these adjustments depend on exposure to the alternating forms and that there must be a conscious realization on the part of the

speaker that the two forms are related. Further, the adjustment is claimed to occur in the rule system rather than as a change in underlying representation.

In discussing the relation of orthography to underlying phonological form, Steinberg (1973) disagrees with Chomsky and Halle (1968), asserting that the child's initial representation of a word is close to a phonetic representation and is associated with what the word means, i.e., a relatively nonabstract sound representation of a word is linked directly with a meaning (p. 245). Steinberg argues that even though through the course of time we develop phonological rules and may change underlying forms to those postulated by Chomsky and Halle, there is no reason to believe that we lose these connections between meaning and phonetic form.

The direct connection between meaning and sound and Steinberg's belief that this connection is maintained lead to the inference that sound mediates importantly a child's early spelling attempts and, further, that these early spelling attempts may be taken as a reflection of the child's underlying phonological representation. In addition, Steinberg feels that since underlying forms are represented at a level closer to the surface phonetic level, one would expect that these underlying phonological representations would vary considerably from one dialect to another.

Various people have investigated and discussed young children's orthography. Read (1975) examined the invented spellings of twenty preschool children. Aside from minor variations, all the children invented spellings that were similar. Read took these spellings to reflect certain judgements about the children's representations of English sounds which differed

importantly from judgements which literate adults would make (p. 330). Read said that at an early age, the children seemed to have inferred that letters represent sounds. In general, the children's spellings were consistent and had phonetic bases. Read presented evidence that many children's original spellings which occurred in his data with great frequency cannot be explained in terms of the influence of standard spelling or by confusion of letter shapes or unusual pronunciations. He inferred that spelling, at least for young children, represents a code on spoken language (p. 76).

Chomsky (1971, 1975) also asserted that five- and six-year-old children spell phonetically, stating that their spellings must be deciphered via their own systems. She cited a child who wrote with as WF and pronounced it /wIf/.

Henderson, Estes, and Stonecash (1972) looked at misspellings in the written work of twenty-five beginning readers who were participating in a language-experience reading curriculum. Overall, patterns in the children's spellings were consistent. Henderson et al., concluded that the misspellings of beginning readers reflect general knowledge of word form.

Based on spelling tasks in which nearly two hundred first- through fourth-grade children participated, Beers, Beers, and Grant (1977) concluded that children rarely make random errors in spelling. They found only a small number of different spellings for each word. Beers et al. drew an analogy between language acquisition and learning to spell; children do both by being exposed to input, developing and gradually revising a rule system that will give acceptable standard output.

Brengelman (1970) discussed phonological underlying forms as it relates to orthography and dialects. He maintains that differences in pronunciation among the dialects of English reflect differences in the underlying phonological systems of speakers and, therefore, the English spelling system will fit some dialects better than others.

Boiarsky (1969) analyzed the consistency between Appalachian dialectal pronunciation of vowels and the spelling of words containing these vowels in one hundred and fifty high school students in rural West Virginia. She found that a large proportion of spelling errors related to dialect characteristics. She inferred from the data that spelling and pronunciation patterns are interdependent but separate systems.

Graham and Rudorf (1970) administered an orally presented spelling task to groups of sixth graders who spoke regional dialects of English. Graham and Rudorf felt that the most significant influencing factor on the spelling of their subjects was dialect, and inferred that phonological cues form a basis for a significant part of a child's spelling performance.

All of these studies dealt with regional dialects. There is also evidence that social dialectal pronunciation and spelling performance in young children are related. Kligman, Cronnel, and Verna (1972) tested black and white second graders for spelling errors predictable by dialect, using a multiple choice format including dialectal spellings. They found that spelling performance based on nondialect errors was comparable for both groups, but that black children made significantly more dialect-related errors. They concluded that dialectal pronunciation and spelling are related, but did not infer anything about possible relations to underlying

phonological structure.

Wolfram and Whiteman (1971) traced a great number of writing errors to dialect interference, asserting on this basis that the phenomenon of dialect interference was not limited to spoken language.

O'Neal and Trabasso (1976) felt that underlying phonological representation might be reflected in children's spellings, and set out to find empirical evidence concerning the alphabetic principle and Smith's (1972) denial that there is phonological mediation in the orthography. The alphabetic principle is that a correspondence exists between written symbols and the sounds of the language. O'Neal and Trabasso investigated the relationship of spelling and phonology by examining how black and white children spelled words of four types: (1) words not expected to be confused by black or white speakers (e.g., tray, away; blue, glue); (2) words expected to be confused by SE speakers (ate, eight; are, or); (3) words expected to be confused in VBE (ball, boil; coal, cold); and (4) words that could be expected to have phonological changes in VBE but not in SE (both, tooth, coldest, wildest). Words chosen for the latter two categories were chosen from five categories of possible phonemic transformations given in Labov (1969). These are: changes in the interdental fricatives /θ, ð/, r-lessness, vowel changes, nasal confusion (/I/ vs. /ɛ/), and final consonant changes.

In their investigation, O'Neal and Trabasso had third- and fifth-grade inner-city black and white children and suburban white children participate in a written spelling task presented orally by a middle class white teacher. Their instructions required the children to repeat the words to themselves five times and then write the word. This procedure was used to reduce the

possibility of the teacher's pronunciation influencing the spelling. The expectation was that spelling would reflect underlying form, and that if words were homophonous (e.g., bear, bare) and therefore had the same underlying forms, they would be spelled in the same way. Words were presented both in isolation and in sentential context, but only one condition was presented to any group of children.

O'Neal and Trabasso found that the children gave a large proportion of homonyms in spelling the words of the confusable categories (Types 2 and 3 above). They took this to be evidence for a sound-to-letter correspondence in these children. However, all groups gave more homonymous spellings for the SE confusable words (words like ate - eight, due - do). This may be related to the fact that these were the words which were pronounced homophonously by the teacher. When words were presented in sentential context, all groups of children gave about fifty percent fewer homonymous spellings.

Their data was also analyzed in terms of the number of unconventional variations in spelling which occurred. They found that in those categories in which differences were expected for VBE speakers, black children gave a greater number of unconventional spellings than did white children, but the effect decreased from third to fourth grade. In a more detailed analysis of the words, they looked at individual segments for variations in the sound-to-letter correspondences which were predictable according to Labov's (1969) phonological description of VBE. Such variations were made by the black children significantly more often than by the white children.

In an analysis of the percentage of unconventional spellings conforming

to the predicted sound-to-letter correspondence for VBE for the five phonological categories investigated, O'Neal and Trabasso found that only the third-grade children showed reliably higher proportions of unconventional spellings in these categories. These differences were not maintained by the black fifth graders except for /t/ in the final consonants category (p. 184). In general, their results revealed that there is a connection between phonological representation and spelling and that phonological differences in dialect do lead to spelling differences. Since the third-grade black children had more of the predicted spelling variations than whites but these variations were not maintained in the unconventional spellings of the older blacks, O'Neal and Trabasso concluded that schooling reduces unconventional variations in spelling and that Smith's (1972) claim that the alphabetic principle bears little or no relation to writing is in error.

The present study was designed to investigate the issue of underlying phonological representation of blacks and whites using a visually presented spelling task involving words which are supposedly homophonous in VBE. A dialect screening test was also administered to confirm which children were actually speakers of VBE.

Studies of adult speakers of VBE suggest that they have the same underlying phonological representations as speakers of SE. However, some differences appear to be present in younger speakers of the two dialects (Labov, 1972a; Luelsdorff, 1975). As children move into adolescence, they try to conform and identify with their peer group, and certain changes in speech patterns result. At this point, the older peer group has shifted

toward SE which influences the younger child entering this group. Thus, it may be inferred that the "purest" form of the dialect, the greatest percentage of many of the characteristic forms of VBE with the least variability, might be found in the youngest children.

If the dialectal differences do represent deep structure differences in the underlying phonological forms, we would expect those underlying form to affect the spelling patterns of VBE-speaking children. O'Neal and Trabasso's (1976) failure to find evidence confirming this hypothesis may have resulted from their using children who were already strongly influenced by SE.

The present study, while similar in part to that of O'Neal and Trabasso, was designed to test second graders who have had less contact with SE and less formal reading and spelling training. (All second graders were tested relatively early in the academic year.) If we assume that child speakers of VBE have different underlying forms and that they adjust output forms to be increasingly similar to SE with increasing exposure to SE, then these second graders would have done less adjusting than older children (e.g., the third and fifth graders in the O'Neal and Trabasso study).

Context helped O'Neal and Trabasso's (1976) children disambiguate homophonous words. For all groups, context reduced homonymous spellings by about fifty percent. Based on these results, O'Neal and Trabasso suggested that meaning plays an important role in lessening the extent to which a child relies on phonology to spell a word. The lack of reading and spelling experience of younger children would reduce the degree to which context

helps them differentiate words via spelling. All spelling words were meaningfully disambiguated by the visual presentation of the task in the present study. Finding that this use of context does not cause a significant lack of homonymous spellings would support the assumption that younger children are relying more heavily on phonology than on other factors as aids in spelling, specifically, integrated motor sequences, rote spelling lists, and analogic strategies as discussed in Smith (1972).

In order to examine the effects of regional dialect features on the results of the study, two populations from different geographic areas were used. One population (Jersey City) was in a large east-coast metropolitan area while the other (Lancaster, Pennsylvania) was an urban population located in a predominantly rural area of east-central Pennsylvania. The New Jersey - New York metropolitan area has an r-less regional dialect. Since r-lessness is also a feature of VBE, it was anticipated that it would be difficult to investigate social dialect usage of r-lessness in the Jersey City population. The regional dialect of Lancaster, PA, is a r-ful one. Thus, it was possible to examine r-lessness as a VBE feature in the Lancaster population.

Subjects were 372 children (140 blacks and 232 whites), ranging in age from 8 years, two months through 8 years, 11 months. All subjects were beginning second graders whose reading instruction had consisted of a phonics approach.

The spelling task was presented to children in groups of 15-20 in a classroom setting. The children were shown pictures and asked to guess the word which corresponded to each picture. Neither the investigator nor

the teacher and aides said the word. Once the correct word had been identified, children were instructed to say it to themselves and then write the word.

The pairs of words and categories of dialectal change which render them homophonous are given in Table 1, with descriptions of how each was depicted.

A dialect screening task was administered to 174 of the subjects (those for whom parental consent had been obtained). A point biserial correlation of .96 ($p < .01$) between speaker race and dialect was obtained. This high correlation, along with evidence that the correlations between race and spelling ($r = .54$, $p < .10$) and dialect and spelling ($r = .53$, $p < .01$) were high and similar, supported the analysis of spelling results by racial groups.

The spelling results were scored both by VBE homophonous pairs and by individual words. Ignoring city differences, blacks spelled significantly more of the VBE homophonous word pairs identically than did whites, as may be seen in Table 2. In examining identical spelling of word pairs for individual populations of the two cities, however, these results were significant only for the Lancaster population.

Word pairs were categorized either as identical, similar, or different. Correctness was not considered, since e.g. sic would be incorrect for either sick or six, but was, in fact, used as the spelling for both members of that pair by several children. Similar spellings were those in which the child used phonetic spellings which would be pronounced the same, such as kat and cat for caught and court.

Table 1. Pairs of BEV homophones and the dialectal phonemic changes expected, with an indication of how each was depicted.

Final consonant devoicing

cab - a taxi cab; cap - a ball cap
bag - a grocery bag full of groceries; back - a man with a bare torso, seen from the rear
seed - several seeds lying on the ground next to a plant; seat - theater seats
pig - a pig; pick - a hand pulling an apple from a tree branch
robe - a man's bathrobe; rope - a coil of rope beside a noose

Loss of final consonant and/or consonant cluster reduction

belt - a man's leather belt; bell - a large, conventionally shaped bell
road - a road winding off into fields, over hills; row - rows of theater seats
cold - a man, warmly dressed, shivering, with an icicle on his nose; coal - a man in a miner's hat (with a light) shoveling coal
wind - a mechanical robot toy with a prominent wind-up key on its back; wine - a corked bottle containing dark liquid, beside a wine glass
hold - a woman holding a baby; hoe - a man using a hoe in a garden
six - a large numeral 6; sick - a boy with an unhappy face, droopy eyes, an ice pack on his head, and a thermometer in his mouth
toast - two slices of bread coming out of a toaster; toes - the front portion of a bare foot

R-deletion

guard - a night watchman with a gun, holding a flashlight; god - a figure in flowing robes standing on a cloud
court - a man standing in a pleading manner before a judge who is seated at a judge's bench in a courtroom; caught - a ball glove catching a baseball

Vowel change

pen - a ball point pen with a pocket clip; pin - an open safety pin
ten - a large numeral 10; tin - an opened tin can
peel - a woman peeling a potato, with a long peel hanging down from the potato; pill - a bottle of pills, with a few individual tablets lying at the base of the bottle
pound - a hammer striking a surface; pond - a small body of water on a farm, with a duck swimming on it
beer - a can, bottle, and glass of foaming beer; bear - a bear

Table 2. Percent of word pairs in which members were spelled identically and/or similarly.

| | Identical | Similar | Identical + Similar |
|---|---|---|---|
| Jersey City | | | |
| White | | | |
| percent | 5.26 | 3.52 | 8.77 |
| standard deviation | .05 | .04 | .07 |
| Black | | | |
| percent | 15.71 | 7.52 | 23.22 |
| standard deviation | .12 | .07 | .13 |
| t (19) | 1.72 | .94 | 2.04* |
| Lancaster | | | |
| White | | | |
| percent | 4.93 | 1.49 | 6.42 |
| standard deviation | .06 | .03 | .07 |
| Black | | | |
| percent | 13.20 | 3.69 | 16.89 |
| standard deviation | .09 | .05 | .11 |
| t (19) | 6.41** | 2.89** | 6.71** |
| Both Cities Combined | | | |
| White | | | |
| percent | 5.15 | 2.86 | 8.01 |
| standard deviation | .06 | .04 | .07 |
| Black | | | |
| percent | 14.66 | 5.92 | 20.58 |
| standard deviation | .11 | .07 | .12 |
| t (19) | 11.32** | 5.28** | 12.32** |

* $p < .05$

** $p < .01$

T-tests for the difference between independent means were performed for black and white children's identical and similar spellings of word pairs, for Jersey City subjects, Lancaster subjects, and all subjects from both cities.

Results, in Table 2, for pairs in which the two members were spelled similarly (as defined above) show the same pattern. For the entire population (both cities combined), blacks spelled significantly more word pairs similarly than did whites. An analysis of the two city populations separately revealed this same distribution, but the difference was significant only in the Lancaster population, as seen in Table 2.

Since both identical and similar spellings of the members of word pairs reveal a dialectal spelling, these two measures were combined. The results (Table 2) show that blacks in both cities produced significantly more dialectal spellings than whites.

Tables 3 and 4 give the percentages of identical and similar spellings for each word pair by children in the racial and city groupings. In general, more black children gave identical or similar spellings than did white children. There were only three exceptions to this.

The final consonant devoicing category had the lowest percentages of black children giving identical spellings for word pairs, while vowel change pairs had the highest. Vowel change words were also spelled identically by higher percentages of whites than were pairs in any other category.

Identical results can be seen in the Lancaster population, with the single exception that no children gave identical or similar spellings for the pair six - sick.

Table 3. Percent of children spelling each pair identically and similarly for Jersey City and Lancaster combined.

| | White | | Black | |
|---|---|---|---|---|
| | Identical | Similar | Identical | Similar |
| Final consonant devoicing | | | | |
| cab - cap | 4.2 | 0 | 5.1 | 2.6 |
| bag - back | 1.0 | 0 | 0 | 0 |
| pig - pick | 1.0 | 0 | 2.6 | 2.6 |
| feed - feet | 2.1 | 0 | 6.4 | 3.8 |
| seed - seat | 0 | 0 | 10.3 | 1.3 |
| robe - rope | 1.0 | 0 | 3.8 | 0 |
| Loss of final consonant and/or cluster reduction | | | | |
| belt- bell | 2.1 | 0 | 2.6 | 0 |
| road - row | 1.0 | 0 | 11.5 | 5.1 |
| wind - wine | 9.4 | 0 | 19.2 | 14.1 |
| hold - hoe | 1.0 | 0 | 9.0 | 2.6 |
| six - sick | 1.0 | 0 | 0 | 0 |
| toast - toes | 1.0 | 4.2 | 14.1 | 9.0 |
| R-deletion | | | | |
| guard - god | 10.4 | 0 | 15.4 | 10.3 |
| court - caught | 10.4 | 4.2 | 14.1 | 9.0 |
| Vowel change | | | | |
| pen - pin | 4.2 | 0 | 30.8 | 9.0 |
| ten - tin | 5.2 | 0 | 24.4 | 0 |
| peel - pill | 7.3 | 1.0 | 21.8 | 7.7 |
| pound - pond | 7.3 | 0 | 6.4 | 0 |
| beer - bear | 6.3 | 0 | 19.2 | 2.6 |

Table 4. Percent of children spelling each pair identically and similarly for each city.

| | Jersey City | | | | Lancaster | | | |
|---|---|---|---|---|---|---|---|---|
| | White | | Black | | White | | Black | |
| | Iden. | Sim. | Iden. | Sim. | Iden. | Sim. | Iden. | Sim. |
| **Final consonant devoicing** | | | | | | | | |
| cab - cap | 4.8 | 0 | 24.4 | 2.2 | 3.0 | 0 | 9.1 | 3.0 |
| bag - back | 0 | 0 | 0 | 0 | 3.0 | 0 | 0 | 0 |
| pig - pick | 0 | 0 | 2.2 | 0 | 3.0 | 0 | 3.0 | 6.1 |
| feed - feet | 1.6 | 0 | 2.2 | 4.4 | 3.0 | 0 | 12.1 | 3.0 |
| seed - seat | 0 | 0 | 15.6 | 2.2 | 0 | 0 | 3.0 | 0 |
| robe - rope | 0 | 0 | 0 | 0 | 3.0 | 0 | 9.1 | 0 |
| **Loss of final consonant and/or cluster reduction** | | | | | | | | |
| belt - bell | 3.2 | 0 | 2.2 | 0 | 0 | 0 | 3.0 | 0 |
| road - row | 0 | 0 | 17.8 | 8.9 | 3.0 | 0 | 3.0 | 0 |
| wind - wine | 9.5 | 0 | 17.8 | 22.2 | 9.1 | 0 | 21.2 | 3.0 |
| hold - hoe | 0 | 0 | 13.3 | 4.4 | 3.0 | 0 | 3.0 | 0 |
| six - sick | 1.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| toast - toes | 0 | 6.3 | 15.6 | 6.7 | 3.0 | 0 | 12.1 | 12.1 |
| **R-deletion** | | | | | | | | |
| guard - god | 15.9 | 0 | 24.4 | 15.6 | 0 | 0 | 3.0 | 3.0 |
| court - caught | 14.3 | 22.2 | 22.2 | 28.9 | 3.0 | 0 | 9.1 | 12.1 |
| **Vowel change** | | | | | | | | |
| pen - pin | 4.8 | 0 | 24.4 | 0 | 3.0 | 0 | 39.4 | 0 |
| ten - tin | 6.3 | 0 | 26.7 | 0 | 3.0 | 0 | 21.2 | 0 |
| peel - pill | 7.9 | 1.6 | 15.6 | 6.7 | 6.1 | 0 | 30.3 | 9.1 |
| pound - pond | 6.3 | 0 | 8.9 | 0 | 9.1 | 0 | 3.0 | 0 |
| beer - bear | 6.3 | 0 | 20.0 | 2.2 | 6.1 | 0 | 18.2 | 3.0 |

The general trends were the same for the Jersey City polulation. However, the exceptional items differed and there were four exceptions.

The results of the analysis of the spelling word pairs supports the hypothesis that some black children have identical underlying phonological representations for some homophonous word pairs. These results also suggest that both black and white children have a greater tendency to confuse words in the vowel change pairs than words in the other categories. This may be because the sound-letter correspondence in English is less systematic for vowels.

The word pairs involving r-deletion (god - guard, caught - court) were spelled identically/similarly by a high percentage of whites in Jersey City, but not by whites in Lancaster. The regional dialect in Jersey City is an r-less dialect, so that blacks and whites in this community have r-deletion as a rule of their phonology. This is a plausible explanation for the failure to find a significant difference between the two groups in Jersey City.

R-word pairs were eliminated from the data and t-tests of independent means were done. A significant difference was found between the percent of Jersey City black vs. white children spelling pairs of words identically (see Table 5) and for identical and similar spellings combined. The differences for the Lancaster group remain significant as when the r-word pairs were included. However, the difference between blacks and whites for pairs spelled similarly was not significant for either city. This was due to the fact that many children used k for c in one member of the pair caught - court, thus a pair which was very frequently scored as similar was eliminated through elimination of the r-pairs.

Table 5. Percentages of word pairs in which members were spelled identically or similarly, with pairs involving r eliminated.

| | Identical | Similar | Identical + Similar |
|---|---|---|---|
| Jersey City | | | |
| White | | | |
| percent | 3.77 | 2.42 | 6.19 |
| standard deviation | .05 | .04 | .07 |
| Black | | | |
| percent | 13.35 | 5.28 | 18.63 |
| standard deviation | .12 | .06 | .13 |
| t (17) | 4.10* | 2.01 | 3.57* |
| Lancaster | | | |
| White | | | |
| percent | 4.80 | 1.49 | 6.28 |
| standard deviation | .06 | .03 | .07 |
| Black | | | |
| percent | 12.54 | 3.11 | 15.66 |
| standard deviation | .10 | .05 | .11 |
| t (17) | 5.84* | 2.21 | 3.06* |
| Both Cities Combined | | | |
| White | | | |
| percent | 4.10 | 2.12 | 6.22 |
| standard deviation | .05 | .04 | .07 |
| Black | | | |
| percent | 13.01 | 4.38 | 17.39 |
| standard deviation | .11 | .06 | .12 |
| t (17) | 10.38* | 4.40* | 3.42* |

* $0 < .01$

For the analysis of the spellings of individual words, four categories were used: (1) correct and phonetic, (2) dialectal, (3) hypercorrect/intrusive consonant, and (4) uninterpretable. Phonetic spellings were those which had the correct consonants (or similar consonants) for a phonetic spelling of the SE pronunciation of the word. Dialectal spellings were those in which the child appeared to be spelling the output of one of the dialectal phonemic change rules for VBE (r-deletion, final consonant deletion or devoicing, consonant cluster reduction).

Words in which a hypercorrection was observed, the most common example being an r in the words caught and god, were placed in the third category, hypercorrect/intrusive consonant. Also placed in this category were intrusive consonants which were not hypercorrections because the opposing member of the homophonous pair does not carry that consonant. For example, addition of a d to coal (c.f., pair member cold) is a hypercorrection. But the addition of K to belt (giving belk), which was not only found in the spelling but observed in the pronunciation of the Jersey City black children, cannot be classified as a hypercorrection. These cases were classified as intrusive. Due to the similarity of these two types of errors, however, they were combined as one category.

Other unconventional spellings were categorized as uninterpretable (e.g., coybar for court), as were spellings which indicated that the child had spelled the wrong word (e.g., caot, assumed to be the word coat, for robe).

Vowel change was not included in this analysis since spelling of vowels was not consistent enough to reveal these changes. If the vowel was identical to that of the other member of the homophonous pair and consonants

exhibited a dialectal pattern, giving basically a "similar" spelling as defined in the homophonous pairs analysis, this word was considered to represent a dialectal spelling. For example, given the spellings cat and kat for caught and court, respectively, cat or kat (court) would be classified as dialectal. Otherwise, the vowel-change words were placed according to their consonants in one of the other three categories. Nasal confusion words were dealt with in the same way, e.g., for the pair pin - pen, use of pen as a spelling for pin or vice versa was considered to be a dialectal spelling; pan was considered dialectal only if both words were spelled this way.

For each of the five spelling response types, a two-way analysis of variance was performed (2 cities x 2 races). As may be seen in Table 6, race was found to be a main effect for all five independent variables. Blacks produced fewer correct and phonetic spellings than whites, but more dialectal, hypercorrect/intrusive and uninterpretable spellings. For the correct and dialectal categories, city was also a main effect. Lancaster children spelled more words correctly while Jersey City children gave more dialectal spellings. (Means are given in Table 7.)

There were two-way interactions of city x race for phonetic and dialectal spellings. The interaction for the phonetic category is attributable to the fact that Jersey City whites spelled more words phonetically than either Jersey City blacks or Lancaster whites or blacks, while the Jersey City blacks spelled fewer words phonetically than Lancaster whites or blacks. Scheffe tests revealed that the difference between the means for Jersey City blacks and whites was significant at the 95% level of

Table 6. Analyses of variance of spelling response types by race and city.

| | Source of Variation | DF | Mean Square | F |
|---|---|---|---|---|
| Correct Spelling | | | | |
| | City | 1 | 584.11 | 9.68* |
| | Race | 1 | 6687.59 | 110.77* |
| | City x Race | 1 | 0.02 | ~ 0 |
| | Error | 368 | 60.37 | |
| Phonetic Spelling | | | | |
| | City | 1 | 4.95 | 0.14 |
| | Race | 1 | 828.03 | 23.53* |
| | City x Race | 1 | 470.83 | 13.38* |
| | Error | 368 | 35.20 | |
| Dialectal Spelling | | | | |
| | City | 1 | 356.19 | 36.47* |
| | Race | 1 | 6580.07 | 673.77* |
| | City x Race | 1 | 265.32 | 26.25* |
| | Error | 368 | 9.77 | |
| Hypercorrect/Intrusive Consonant Spelling | | | | |
| | City | 1 | 13.23 | 2.27 |
| | Race | 1 | 352.84 | 60.49* |
| | City x Race | 1 | 1.00 | 0.17 |
| | Error | 368 | 5.83 | |
| Uninterpretable | | | | |
| | City | 1 | 0.32 | 0.05 |
| | Race | 1 | 113.45 | 16.10* |
| | City x Race | 1 | 20.17 | 2.94 |
| | Error | 368 | 7.05 | |

* $p < .01$

Table 7. Means for spelling response types by city and race.

| Correct Spelling | | |
|---|---|---|
| | Jersey City | Lancaster |
| White | 17.62 | 20.25 |
| Black | 8.82 | 11.42 |

| Dialectal Spelling | | |
|---|---|---|
| | Jersey City | Lancaster |
| White | 2.43 | 1.81 |
| Black | 12.56 | 8.42 |

| Uninterpretable Spelling | | |
|---|---|---|
| | Jersey City | Lancaster |
| White | 0.88 | 1.35 |
| Black | 2.42 | 1.89 |

| Phonetic Spelling | | |
|---|---|---|
| | Jersey City | Lancaster |
| White | 17.59 | 15.42 |
| Black | 12.60 | 15.21 |

| Hypercorrect/Intrusive Consonant Spelling | | |
|---|---|---|
| | Jersey City | Lancaster |
| White | 1.48 | 1.17 |
| Black | 3.59 | 3.06 |

| Number of Children | | |
|---|---|---|
| | Jersey City | Lancaster |
| White | 157 | 75 |
| Black | 78 | 62 |

confidence (comparison value = 2.21) and that the difference between the means for Jersey City and Lancaster blacks was significant at the 99% level of confidence (comparison value = 2.89).

The city x race interaction for the dialectal category is attributable to the higher means for Jersey City as compared to Lancaster subjects and the higher means of blacks as compared to whites; the difference between the blacks in the two cities was larger than the difference between the whites. Scheffe tests revealed significant differences between the means for blacks and whites in both cities and between the means for blacks in Jersey City and Lancaster (comparison value = 2.14, at the 99% level of confidence).

These results indicate that for both the Jersey City and the Lancaster populations, black children spelled more words in a manner parallel to what has been reported for spoken forms of VBE and had greater difficulty producing standard (correct or phonetic) forms. In addition, children from the metropolitan area exhibited greater difficulty with spelling than children from Lancaster.

The present study adds to the evidence that early spelling is influenced by the dialect spoken by children. These data support the hypothesis that children who speak different dialects have different underlying phonological forms. In the analysis of homonymous spellings of the word pairs presented, a significantly higher percentage of blacks spelled pairs identically and similarly than did whites, although these differences were more marked for the Lancaster subjects than for the Jersey City subjects.

The analysis of spelling errors, of words assumed to be homophonous

in VBE but not in SE, revealed significantly greater numbers of spelling errors among the black children than among white children. Furthermore, the errors of the black children consisted of spelling the homophonous words in the same way, reflecting the lack of differentiation manifest in the spoken language. The consistency of the unconventional spellings for large numbers of black children nullifies the alternative that black children made more spelling errors simply due to school failure or intellectual inferiority.

The relationship between spelling and phonology was given further indirect support by the results of the data related to r-less dialects. Most black dialects are r-less, while most white dialects are not. In the Lancaster population of the present study, the difference between the two dialects was reflected in the spelling of words involving the letter r. In Jersey City, however, the dialect of both blacks and whites is r-less and this was reflected by an absence of difference between the two racial groups on spelling words involving r. When the r-words were eliminated from the data, significantly more blacks than whites among the Jersey City subjects were found to have spelled members of word pairs identically.

Further evidence for differing underlying phonological representations in VBE and SE is found in the analysis of the unconventional spellings of individual words. Blacks exhibited a significantly greater frequency of dialectal spellings than did whites in both cities. In addition, before the removal of the words containing r, blacks in both cities showed a significantly higher usage of hypercorrect or intrusive consonants. Many of these were intrusive, indicating that the children were unaware of what

the correct consonant should have been. If the hypercorrect/intrusive category consisted predominantly of r-words, it could be argued that this was a function, at least in Jersey City, of the regional r-less dialect. However, had this been the case, no significant differences would have been expected between Jersey City blacks and whites, but such differences were, in fact, found.

Also, Jersey City subjects, who were found to have more dialectal differences than the Lancaster subjects, had significantly more hypercorrect/intrusive spellings than the Lancaster group (both blacks and whites) even with the r-data eliminated. The presence of high percentages of this type of spelling, in some cases equalling the percentages of dialectal spellings given by the children, can be interpreted as evidence that the children have different underlying phonological forms from those of adults (which, in general, are thought to mirror conventional orthography). Hypercorrections and intrusions are evidence that an attempt is being made to alter the output by changing the form or formulating adjustment rules, but that adjustment has not yet been completed.

On the basis of the children's spelling responses in this study, it is claimed that children in early second grade are in a state of transition concerning underlying phonological representations. They seem to have, as hypothesized by Braine (1974), taken their underlying representations directly from the data most frequently heard by them in their environment, i.e., from the dialect spoken by their families and their peer groups. As the nature of that data changes, the children, who have a flexible phonological system at this point, apply an adjustment process to their underlying representations.

Such a position is compatible with Donegan and Stampe's (1978) conception of underlying form as a representation in permanent memory. Viewing underlying form as a representation in permanent memory implies that the basic underlying representation does not change. Rather, adjustment must be in the form of new rules which are applied to the underlying representation to give different output. Thus, while the data of the present study support Braine's notion that underlying phonological form is initially inferred as phonetic and environmentally influenced, they do not support his particular method of adjustment, i.e., changing or restructuring underlying representation within each speaker. The adjustment, according to the findings of the present study, is most probably done through rules.

Hudson's (1975) discussion of the phenomenon of levelling resembles Braine's adjustment hypothesis but explains it through rules. It may be the case that a child adopts a phonemic underlying form, then constructs/acquires rules relating this to alternants, whether they are phonetic alternants (as in Braine, 1974) or an alternation between dialects (as in test: SE /test/, VBE /tes/). In the former case (phonetic alternants), the rule would be categorical. In the latter (dialectal alternation), the rule would apply variably dependent upon social situational factors. In this case, Hudson's leveling would be the replacement of the first dialect by a second. This is a not uncommon phenomenon among VBE and other nonstandard dialect speakers. Many of them, having learned to code-switch effectively, will gradually move toward exclusive use of the standard dialect.

Based on the spelling data from this study and the literature concerning child spelling and phonological acquisition, it appears that the underlying

phonological representations from persons speaking other dialects for those words whose pronunciations differ for the two dialects. The educational system and greater social mobility of adults tend to have an equalizing effect on dialect, so that adjustments made by children move toward a phonology which corresponds to SE, the prestige dialect.

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