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AN INVESTIGATION OF THE SPELLING STRATEGIES
OF GRADE ONE STUDENTS

by

Margaret Sheila Pace

B. Ed. Simon Fraser University 1979

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS (EDUCATION)

In the Department

of

Education

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September 1985

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ABSTRACT

The purpose of this study was to examine the spelling attempts of grade one students during the first six months of school to determine what spelling strategies they used and to see if their spelling strategies showed a progression towards conventional spelling.

The subjects were twenty-six grade one students from three classrooms in School District # 42 (Maple Ridge/Pitt Meadows). There were two methods for collecting data:

- 1) A Spelling Test of eighteen words containing twenty-five phonetic features that were shown in previous studies to elicit particular spelling errors. The Spelling Test was administered at six week intervals.

- 2) Writing Samples were collected from students' independent writing. The Writing Samples were collected at three week intervals.

The Spelling Classification System that was used was developed by Gentry. It included the following five spelling strategies: correct, transitional, phonetic, semiphonetic and precommunicative. The students' spelling attempts were classified according to which spelling strategy was used for each phonetic feature. The scores for each spelling strategy were then charted for each student and each phonetic feature. Percentage of scores were computed for the use of each spelling strategy and studied over time. The data were analyzed to examine the spelling strategies that the students used throughout the six month period and to determine whether a progression towards conventional spelling could be detected.

The findings indicate that the strategies used by students could be classified as described by Gentry and that the students moved from using simple phonetic strategies to using more complex strategies that incorporate underlying linguistic elements. The implications of this study for educators were discussed.

DEDICATION

To my husband, Greg, and my daughter, Alana,

who are God's special gifts to me.

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CHAPTER I

Introduction

Nature of the Problem

Traditionally, writing has been viewed as an outgrowth of reading, and so reading instruction often has preceded opportunities for children to write (Smith, 1982). This practice reflects the assumption that children need instruction in the skills involved in transcribing language before they can be expected to produce their own written work. Therefore, traditionally, basic competence with conventional spelling has been considered a prerequisite for experiences with independent written expression.

This approach is very different from the way in which children learn to speak. Children come to school as very effective oral language users and yet they have received no systematic instruction. Instead, children are allowed to experiment actively with spoken language while receiving encouragement as they attempt to communicate. If learning to spell, like learning to speak, is acquired by actively forming and testing hypotheses to learn the underlying rules of language, then the traditional model of instruction should be examined. The linear model of skill acquisition that assumes children need to become competent in the transcribing skills of language before they can write independently, largely ignores the linguistic capabilities that children already possess when they come to school. Further, it does not give adequate consideration to the

interrelatedness of reading and writing nor the active, problem-solving nature of the language learning process (Wilson, 1981).

A basic premise of this study is that literacy education is not a "linear process but one of gradual synthesis and integration" (Forrester, 1980, p.187). The ability to spell accurately need not be a criterion for allowing young children to write. Rather, when young children wish to communicate, they can be encouraged to write using spellings which reflect their understanding of English orthography. Children can experiment with spelling like babies experiment with sounds as they babble while learning to speak. It is proposed here and has been argued by others (Chomsky, 1971; Clay, 1975; Ferreiro & Teberosky, 1982; Forrester, 1980; Gentry, 1977; Giacobbe, 1981; Graves, 1983; Read, 1980; Wood, 1982), that beginning grade one students do have sufficient knowledge to begin writing if they are allowed to experiment actively with their own spellings and if correctness in form is not stressed.

Questions for Investigation

The purpose of this study is to examine the spelling attempts of grade one students during the first six months of school to determine the spelling strategies they use, and to see if their spelling strategies exhibit a progression towards conventional spelling.

More specifically, the following questions will be addressed:

a) What spelling strategies do selected grade one students use when spelling a list of test words with phonetic features that have been shown

in previous studies (Beers & Henderson, 1977; Gentry, 1977; Read, 1971, 1975) to elicit particular spelling errors?

b) What spelling strategies do selected grade one students use when writing independently?

c) Do the spelling strategies of selected grade one students show a progression towards conventional spelling?

Significance of the Study

Literacy is one of the paramount goals of a democratic society that prides itself in informed and active citizenry (Calfree & Drum, 1978). This study addresses improving our understanding of the writing abilities of young children at a time when there has been considerable concern over the lack of adequate writing skills in our students, particularly in the technical skills of spelling, grammar and usage (Coe, 1982; Graves, 1978). This problem could in part be due to the inadequacy of the traditional approach to teaching writing and the resulting effects on student attitude and performance. If we can become more aware of childrens' linguistic competencies and use this awareness in providing appropriate experiences for beginning writers, we may be able to affect positively the overall writing performance of students.

Thus, the significance of this study is two-fold. Firstly, if early grade one students show a progression toward conventional spelling, then experiences with written expression need not be delayed until competence with conventional spelling is demonstrated. Secondly, by becoming more knowledgeable about the strategies of beginning spellers, educators could

become aware of childrens' perceptions of orthography and respond in ways that could help to expand children's knowledge. For example, if a child is using only phonetic information to spell, the teacher could draw the child's attention to other aspects of spelling such as word meaning and visual cues. Thus, educators could become aware of and capitalize on the linguistic competencies which children already possess and provide appropriate feedback and experience.

Forrester (1980) outlines the benefits that could result from a more integrated, comprehensive approach:

Thus, in fostering spelling development it becomes important to recognize the children's misspellings as cues which signal advances rather than faulty functioning. Given the opportunity to continue their phonic and orthographic guessing games, the children will progress beyond phonetic spelling and overgeneralizations. In class, as at home, spelling, like rules of grammar, evolve to fit adult standards more closely if children are given the chance to learn to spell by spelling when they generate, test and redefine their inner code (p. 188).

Recently there has been an interest in the study of the "invented spellings" of young children (Beers, 1974; Beers & Beers, 1980; Beers & Henderson, 1977; Gentry, 1977; Read, 1971, 1975). These studies, from the United States, warrant further investigation and validation in different environments. The author believes that such a study is appropriate in British Columbia.

Limitations of the Study

This study is limited to the written productions of a selected group of grade one children from Maple Ridge and Pitt Meadows, British Columbia. Only insofar as the sample reflects the larger population can the results

be generalized to other groups. This study is limited to investigating the phonetic features outlined in Appendix A. Thus, the findings can only be generalized to these particular phonetic features.

CHAPTER II

Review of the Literature

Linguistic Theory and Orthography

The changing nature of linguistic theory over the past fifty years has had a significant impact on the view of how orthography reflects language. These changes have also encouraged investigations into the development of language proficiency in children (Bellugi & Brown, 1964; Chomsky, 1969) and the growth of their orthographic knowledge (Beers, 1974; Beers & Beers, 1980; Beers & Henderson, 1977; Clay, 1975; Gentry, 1977; Read, 1971, 1975).

Until the 1950's a structural view of language prevailed which saw orthography as a phonetic transcription of speech (Bloomfield 1933; Fries, 1952). English orthography was thought to be a direct representation of the spoken level of language and, as such, was seen as plagued with inconsistencies. According to this perspective, the role of beginning instruction would be to acquaint the students with the highly predictable sound-to-spelling correspondences and to teach irregular patterns later. It is small wonder that the structural linguists called for substantial reform of the English orthographic system.

During the late 1950's, linguists became dissatisfied with the simple letter-to-sound view of orthography and began to identify linguistic elements, deeper than surface structure, that affect the graphic structure of words (Francis, 1958; Venezky, 1967, 1970; Venezky & Weir, 1968). These linguists, considered part of the linguistic school of "morphophonemics" (Templeton, 1980, p.18), pointed out orthographic regularities among words

at syntactic and semantic levels. For example, Francis (1958) used word pairs such as marine/mariner and advantage/advantageous to exemplify that words that are similar in meaning are often spelled similarly, even though they can be pronounced differently. Venezky (1967) extensively analysed the pronunciations and spellings of twenty thousand of the most common words in English and concluded that:

English orthography contains two basic sets of patterns. The first is the internal structure of the orthography: the classes of letters (graphemes) and the allowable sequences of these classes (graphotactics). The second, and the more complex, is the set of patterns which relate spelling to sound. In the first set are patterns based solely upon graphical considerations and which an illiterate must acquire in learning to read. The second set includes not only patterns which are based upon the idiosyncrasies of the orthography, but also patterns which result directly from English phonological habits...

The simple fact is that the present orthography is not merely a letter-to-sound system riddled with imperfections, but, instead, a more complex and more regular relationship wherein phoneme and morpheme share leading roles (Venezky, 1967, p.77).

The major contribution of this highly theoretical system was in viewing orthography as representing deeper levels of language than the surface sound relation, levels reflective of meaning.

Chomsky and Halle (1968), with their transformational-generative perspective of linguistics, provided the major impetus toward reversing the traditional view of how English orthography reflects language (Gentry, 1977). According to their theory, humans have an intuitive knowledge of language and are uniquely capable of producing and understanding infinite variations of language. The work of Chomsky and Halle (1968) together with similar observation by C. Chomsky (1970) and O'Neill (1972) suggested that orthography corresponds to a level of representation within the phonological system of the language which is deeper than the phonetic

level. This level, termed "lexical representation", is explained by Templeton (1980):

Lexical representations are supposed to reflect the way in which the basic units of our language are stored in our lexicon, or dictionary-in-the-head.....Lexical representation (is) a level at which only enough phonological information is represented to predict the pronunciation of a word in various contexts.....Chomsky and Halle pointed out that words that are similar in meaning are spelled similarly; differences in pronunciation are a more superficial concern and can be handled by applying "Intuitive phonological rules" - rules that for the most part, individuals apply automatically (p. 23).

Thus, word pairs such as courage/courageous, anxious/anxiety, photograph/photography, although different in pronunciation, would be considered as variant forms of the same word. Lexical spelling was seen as capturing this similarity and reflecting the underlying meaning of the language which is masked by surface phonetic features. Therefore, in contrast to the traditional linguists view of English orthography as full of inconsistencies, Chomsky and Halle (1968) saw "conventional orthography.....(as) a near optimal system for the lexical representations of English words" (p. 49). Their theory considered orthography to be a logical system when examined in terms of phonological, morphological and syntactic processes.

C. Chomsky (1970) has explained the need, while teaching children to read and write, to shift the emphasis "away from the phonetic aspects of spelling to a consideration of the underlying lexical properties of the orthographic system" (p. 297). Children's attention should be drawn to the type of relationships between words, not merely to the speech sound relationship. As Chomsky (1970) states:

It is of interest to realize that the child, when he learns to read, is not being introduced to a system of representation that

is inconsistent with the language that he speaks. It is simply that orthography bears an indirect rather than a direct relation to his pronunciation by regular phonological rules that are part of the child's normal linguistic equipment.....Letters correspond to segments in lexical spelling, which in turn are related to pronunciation through the medium of phonological rules. The correspondence is to something real in the child's linguistic system that he is equipped to handle.....The ability of the child to interpret the orthography directly at the lexical level should increase naturally as he becomes more familiar with the relations expressed by the spellings of words (p. 298 - 299).

It has been pointed out that children initially perceive orthography as a phonetic transcription of speech (Read, 1971, 1975). The recent work of linguists such as Chomsky (1970) and Chomsky and Halle (1968), together with what has been studied in child psychology (Piaget, 1952), calls for an approach to language learning that recognizes and develops children's tacit linguistic knowledge.

Psycholinguistic Theory and Orthography

Psycholinguistics or the "scientific study of the uniquely human skills of language learning and use" (Smith, 1973, p. 6) has integrated appropriate elements from cognitive and linguistic theories and has approached language learning as an active, problem-solving process.

The psycholinguistic theory of language learning is reflective of the more general model of cognitive development described by Piaget (1952, 1966). The stages of intellectual development, as outlined by Piaget, are characterized by certain schemes or sequences of action. Entrance into the next stage depends upon assimilation of new input and modification or accommodation of old schemes to fit reality. According to Piaget's theory, the learner must structure experience to understand it and therefore must have much opportunity to interact with the environment.

Recent research in psycholinguistics has shown that "language learning is much more complex than simple imitation. Children are actively and creatively involved in their own language development" (Goodman & Goodman, 1981, p. 438). This active role of the learner is explained by Wilson (1981):

Language learning is characterized by the internalization of rules through the mechanism of hypothesis formation and testing, a process in which the child generates rules, tests hypotheses, modifies them, and repeats the process. The process begins when young children are exposed to language in a natural situation and begin to perceive its communicative function (p.891).

The psycholinguistic theory of language learning reflects Piaget's more general learning theory that children interact with their environment and structure and restructure their ideas as they change their perceptions to fit reality.

Psycholinguistic research has recently attended to the interrelatedness of reading and writing and the similarities between the acquisition of oral and written language. The development of orthographic knowledge can be seen as requiring the active exploration of the learner because it involves both cognitive and linguistic processes. Recent theories reflect this psycholinguistic view of spelling development (Beers & Henderson, 1977; Gentry, 1977; Read, 1971, 1975; Zutell, 1979). Beers (1980) summarizes this viewpoint clearly:

Recently, an alternative hypothesis about how children learn to spell has moved away from (the) mechanistic view. The thrust of this hypothesis is that learning to spell, like learning to speak and read is a language based activity. Following a model akin to the generative-transformation grammar model, researchers now hypothesize that children internalize information about spoken and written words, organize that information, construct tentative rules based on that information, and apply these rules to the spelling of words (p. 36).

Basic to the psycholinguistic view of language learning is the concept of error which is considered "a window on the mind" (Goodman, 1973, p. 3).

As Goodman and Goodman (1981) explain:

It is through a positive view of error that researchers have begun to discover that language learners are creatively and actively involved in their own language learning.....Through errors we see the learner hypothesizing like a scientist, providing evidence of intelligent processing, not simply lack of accuracy (p. 440 - 441).

The fact that an error is made is less significant than how the learner comes to make the error.

Error analysis has contributed substantial gains to the understanding of the reading process (Goodman, 1973) and has made significant contributions to second language teaching (Richards, 1974). Similarly, errors could be important keys to perceiving children's growth in understanding of orthography. Rather than be passed off as bad habits, errors could be considered an indication of the system of organized rules and intelligent strategies that a child is drawing on in order to spell. Since the goal of the present research on the development of spelling strategies is to investigate orthographic knowledge, analysis of errors offers an important research tool.

Children's Conception of Orthography

The Need to Investigate Children's Knowledge

In considering what children know about the English orthographic system, it should be clear that children do not come to school without awareness of language but have an amazing amount of tacit or unconscious linguistic knowledge. Chuvovsky (1963) has referred to the five year old as

a "linguistic genius" (p. 7) on the basis of oral language competency. As such, learning to spell and write in the context of formal schooling is not a new beginning but the continuation of a process that is well underway and which has its origins in children's acquisition of language. Early writing does not exist within a vacuum but is part of the total language learning process.

According to psycholinguists, "literacy is built on the base of the child's existing language" (Goodman, 1969, p. 27). This offers a challenge to educators, as Read (1980) outlines:

This linguistic knowledge influences children's school performance from the start, most notably perhaps in their first formal encounters with the written language. Because children's intricate knowledge of language is not readily inspected, but must be inferred from their performance, we must deal with a system that we do not fully understand. However, it is also clear that we must work with this initial knowledge. We are not writing messages on a blank slate and we cannot - and do not want to - wipe the slate clean, even though it is incomplete and partially inaccurate. Rather, we must contrive to build on the knowledge that the child brings to school (p. 148).

Recently, there has been a growing body of research that has observed the spelling processes of young children to discover what their knowledge of orthography is.

The Research on Invented Spelling

C. Chomsky (1970) hypothesized that children who are beginning to spell perceive orthography on the basis of surface features rather than the more abstract underlying features of words but grow in their awareness with exposure to written language. For example, children initially see the spelling of words such as nation/nationality, critical/criticize, revise/revision as quite dissimilar due to their phonetic differences.

However, with exposure to written language, children can move away from this surface perception to see other elements of orthography that are indicated in the lexical level of representation. Children can then perceive the similarities in the meanings of the words cited above and their spelling would be expected to reflect this.

Charles Read (1971), in his extensive study of the spelling errors of preschoolers who were independently writing, found remarkable similarity in their spelling attempts. He reported that children spelled words according to how they sound, initially relying heavily on a letter-name strategy and categorizing speech sounds on the basis of their place of articulation in the mouth. He discovered little random error but detected a logical progression of error types among children's nonstandard productions. He found, in his later study with six and seven year olds, that early spelling strategies that relied heavily on sound-letter association were replaced by more advanced strategies that reflected more sophisticated application of phonological knowledge (Read, 1975).

Beers (1974) conducted a longitudinal study of the spelling attempts of grade one and grade two students on a list of twenty-four words. He charted their spelling of words containing lax vowels (i.e., "a", as in hat, "e", as in set) and tense vowels (i.e., "a", as in fade, "e", as in heat) over a six month period. Beers, like Read, found that children moved from a letter-name strategy to a correct strategy. Beers reported that these sequential changes were most common in first grade children and suggested that the strategy a child employs to spell a word may be based on his or her cognitive level of development.

Beers and Henderson (1977) also concurred with Read's (1971, 1975) findings after their six month study of the spelling attempts of a class of grade one students in their independent writing during the latter part of the school year. Beers and Henderson (1977) examined the children's spelling of lax vowels (i.e., "e", as in get), tense vowels (i.e., "a", as in gate), morphological markers (ing, ed, er), nasal consonanants (m, n) and flaps (i.e., as in the middle of patter). They, like Beers (1974), identified sequential spelling patterns that suggested four spelling strategies ranging from primitive representations to the correct spelling of the word. In the first strategy children omitted the letter, being examined or represented it in a way that showed little understanding of the correct spelling (i.e., "man", spelled as "dt"). The next strategy was termed the "letter-name strategy" where children used a letter name to represent the sound (i.e., "type", spelled as "tip" or "you", spelled as "u"). At the next level, labelled the "transitional stage" children used letter combinations that showed some knowledge of orthography (i.e., "eighty", spelled as "eitteey"). The final or "correct stage" was when the child spelled the word correctly. Beers and Henderson (1977) hypothesized that the children's different spelling strategies indicated that the children were developing a set of organized rules with which to deal with orthography.

Zutell (1979) administered an expanded version of Beers' (1974) word list to students in grade one to grade four to examine the relationship between children's spelling strategies and their intellectual development in terms of Piaget's (1966) model of cognitive stages. Zutell found that children functioning at the pre-operational level conceptualized

orthography as related to phonetic representation and thus were able to perceive only this one characteristic of the word. However, children functioning at the concrete-operational level were able to move away from the phonetic strategy and showed evidence of awareness of the underlying features of orthography; they were able to perceive more than one characteristic of a word. Zutell (1979) reported that the "children progressively develop more sophisticated strategies for dealing with English orthography" (p. 77) and suggested that "children need the opportunity and encouragement to discover for themselves the structures governing English spelling, just as they invent (in Piaget's terms), the structures which enable them to assimilate reality and tacitly construct the transformational rules which govern the structure of spoken and written language" (p. 79).

Gentry (1977) studied the spelling attempts of students of differing reading ability in kindergarten, grade one and grade two. He tested children on a list of words with twenty-one features that had been shown in Read's (1971, 1975) and Beers and Henderson's (1977) investigations to elicit spelling errors. These features included examples of lax vowels (i.e., "e", as in get), tense vowels (i.e., "a", as in gate), preconsonantal nasals ("n", as in monster, "m", as in stamp), affricates (tr, dr), sonorants (as in human, eagle, bottom), flaps (as in bottom), ed-endings (as in hiked, closed, united) and retroflex vowels or r-controlled vowels (as in monster, chirp, purred). He categorized children's spelling attempts according to a very similar classification system as the one used by Beers and Henderson (1977) but defined another spelling level in his system which is termed as "prephonetic". The five

different levels of spelling as defined by Gentry (1977) were "deviant" for those attempts that were very different than conventional spelling (i.e., numbers for letters, strings of unrelated letters etc.); "prephonetic" for those attempts that indicated the rudiments of a phonetic system such as correct beginning and ending consonants but left out essential parts of the word; "phonetic" for the letter-name strategy whereby all parts of the word were mapped using the sound of the letter names, "transitional" for spellings that were incorrect but showed an understanding of the conventions of orthography (i.e., marking with "e" for tense vowels, digraphs, vowels in every syllable) and "correct" for those words that were spelled correctly. The results of Gentry's (1977) study essentially substantiate previous works:

The findings indicate that prior to grade three, variability in the spelling strategies of beginning readers is very common. Furthermore, a developmental progression of spelling strategies is evidenced progressing from relatively simple surface feature oriented phonetic strategies, to more complex and abstract strategies that incorporate underlying linguistic elements (Gentry, 1977, iii - iv).

Classroom observational studies have reported a similar progression in children's spelling strategies (Forrester, 1980; Paul 1976; Sorenson & Kerstetter, 1979). Several studies (Dobson, 1983; Lancaster, Nelson & Morris, 1982) have traced spelling development in lower achieving students and have reported findings similar to previous works. Bissex (1980) in her comprehensive case study of her son found that:

He moved from associating letter forms in general with meaning to associating specific letter forms with specific speech sounds. Once he mastered an invented spelling system that transcribed speech phonemically, he became aware of other bases for spelling, and focused on units larger than phonemes - on words and on morphemes. Later he was able to coordinate phonic principles,

visual, recall, and morphemic awareness to help determine spellings (p. 205).

Collectively, these studies show that children hypothesize about the orthographic system, invent rules for spelling which they test against the conventional orthography to which they are exposed and readjust and reinvent new rules. Initially, children perceive orthography as being phonetic transcription of speech and later progress to a more sophisticated understanding of orthography that incorporates underlying elements.

The present study extends previous research in the following respects:

- 1) In this study the spelling attempts of grade one students have been studied over a six month period at the beginning of the year rather than at the latter part of the year as was the case with Beers and Henderson (1977). This has been done to examine the children's spelling knowledge before and as they learn to read.
- 2) The spelling errors have been classified according to Gentry's (1977) classification system. Gentry (1977) classified the spelling responses of children on test words but this has not been done previously for children's independent writing.
- 3) The spelling attempts of selected children in three classes have been studied. Previous works have studied the spelling attempts of children in one class only (Beers & Henderson 1977; Paul, 1976; Sorenson & Kerstetter, 1978).
- 4) The children have been tested on a list of words with the phonetic features identified by Gentry (1977), but unlike Gentry the same children have been tested several times over. In this way the children's development in spelling has been studied over time. Data have been

collected from children's spelling attempts in a natural setting of their routine independent writing and in a more controlled setting on a spelling test of words with phonetic features that elicit spelling errors.

Essentially it was hoped that a thorough understanding of these children's spelling attempts would be facilitated by collecting data by these two methods.

CHAPTER III

Methods of Collecting and Treating Data

This chapter contains a description of the subjects who participated in this study and a description of the instruments and procedures used in the study.

Subjects

Selection of Schools

After obtaining permission from School District # 42 (Maple Ridge/Pitt Meadows) the three schools in this study were chosen because of their convenient location and the willingness of the principals and teachers to be involved in the study. Although the schools were similar in socio-economic level, they reflected the different backgrounds of students in the district. One school was in a rural environment with large lots and hobby farms, another school was in an area of relatively new single-family detached houses and town houses and another school was from an older, more well-established area of the district. One class per school participated in the study.

Description of Classrooms

The teachers were given a questionnaire to complete (see Appendix B) to help describe their Language Arts program. All three teachers used Ginn 720 (the prescribed Reading program for School District # 42) as their

primary reading program and used Language Patterns as a supplementary program. All three teachers had the students write at least three times per week after January although the time and method for introducing written expression varied: one teacher started the students writing at the beginning of September, one in November and one in January. The students' role in the beginning writing process varied. In one class the students began writing by dictating a sentence or story to their teacher or grade six or seven student and then copying this sentence or story. In another class the students copied a frame sentence such as "I like ___" or "School is ___" and then completed the sentence independently. In another class the students began writing by using invented spellings to transcribe their message independently. In all three classes dictionaries were introduced late in the year, after the students were reading and writing freely. All teachers accepted some spelling errors in independent writing but expected some words to be correctly spelled. Spelling was not taught as a separate subject but was integrated with reading, printing and phonics instruction.

Selection of Subjects

The students were selected while they were in Kindergarten. Ten students from each school were selected randomly from a list of the students expected to be in the grade one teachers' class who had volunteered to participate in the study. Due to absenteeism and attrition four students were eliminated from the study. This provided a final sample of 26 subjects, 10 from one school and 8 from each of the other schools. There were 12 boys and 14 girls who participated in the study. When the Kindergarten Pretest was administered the students ranged in age from five

years and five months to six years and four months. Four of the students had a first language other than English. One student was receiving speech therapy. According to the judgement of the grade one teachers, 10 children were considered to be above average, 13 children were considered to be average and 3 children were considered to be below average.

Instruments

There were three methods of collecting data: the Kindergarten Pretest, the Grade One Spelling Test and the Grade One Writing Samples.

Kindergarten Pretest

The Kindergarten Pretest consisted of seven words. The list of words contained four examples of lax vowels, three examples of tense vowels, one example of an r-controlled vowel, one example of an affricate and one example of an intervocalic flap. There were six one-syllable words and one two-syllable word. These words were chosen from Read's (1971, 1975) summary of children's nonstandard spellings. The words were selected because it was thought that they would be within the speaking vocabulary of the children and yet provide a measure of the spelling strategies that the children would be using. These words were also chosen to provide a measure for the phonetic features mentioned without requiring too many letters. (See Appendix C for a complete list of words and sentences used for the Kindergarten Pretest.)

Grade One Spelling Test

The Grade One Spelling Test consisted of 18 words that were chosen to encourage invented spellings. The words were selected so that the children would understand the meaning of the word but would not have memorized its spelling. Familiar words like "cat" or "dog" were avoided as were words that occurred in the beginning reading materials. The words were selected from Gentry's (1977) word list and from Read's (1971, 1975) summary of children's nonstandard spellings. The spelling words contained examples of eight phonetic feature categories: tense vowels, lax vowels, preconsonantal nasals, syllabic sonorants, ed-endings, r-controlled vowels, affricates and an intervocalic flap. Each of these phonetic feature categories was subdivided to make 25 phonetic features. This was modelled after Gentry's (1977) study. All five lax vowels were examined here. This is in contrast to Gentry's study which examined two lax vowels. This study examined three r-controlled vowels which is in contrast to Gentry's work which studied two. The 25 features used in this study account for many of the spelling errors of beginning writers (Read, 1975). The spelling list contained one example of each phonetic feature. One exception to this was lax vowels which contained two examples, one in a one-syllable word such as "map" and one in a two-syllable word such as "dragon". There were also two measures of /dr/ because of the words chosen for the other features. Some words contained more than one feature, for example, limped served as a measure for lax vowel /I/, preconsonantal nasal /m/ and ed ending /t/. (See Appendix A for a complete list of feature category, feature and test words.)

Grade One Writing Samples

The Grade One Writing Samples were collected from the students' independent writing. The Writing Samples were examined to find words containing any of the 25 phonetic features being studied. Only words containing these features were used.

Procedures

This section contains a description of the procedures used for administering the Pilot Studies, the Kindergarten Pretest and the Grade One Spelling Test and Writing Samples. The procedures used for scoring are also described.

Pilot Studies

To determine the appropriateness of the procedures for studying the research problem, two pilot investigations were conducted. One pilot investigation took place before the Kindergarten Pretest and the other took place before the Grade One Spelling Test and Writing Sample data collections. For the Kindergarten Pretest, four students from one of the participating schools were randomly chosen from a list of children who would not be in the study and were tested individually. As a result of this pilot study, the list of words was shortened from ten to seven. For the Grade One Spelling Test and Writing Sample data collections, six students from one of the participating schools were randomly chosen from a list of children who would not be in the study and were tested as a group. For the Spelling Test, one sentence was changed to improve clarity of meaning, and for the Writing Sample the instructions were made more specific.

Kindergarten Pretest

To get a measure of the children's spelling ability prior to formal reading instruction, a Pretest was administered in June of the Kindergarten year. (See Appendix C for complete list of the words and sentences used for the Pretest.) The students were tested individually in a corner of their Kindergarten classroom by a trained volunteer who was a substitute teacher. The student used plastic lower-case letters so the physical act of printing the letters would not interfere with their spelling performance. There were children from each school in both morning and afternoon kindergarten sessions, so there was a morning and afternoon testing session for each school. The examiner was given a paper with the following instructions:

Say to the child:

"I am going to ask you to spell some words using these letters. Let's go over them together."

(Take child's hand and touch the letters t, p, r, d, a, e, i).

"Listen carefully to the word I say. Choose the letters you need to spell the word. Put the word here."

(Point to desk top)

"I will say the word, then use it in a sentence and then say the word again. Are you ready?"

After the child finishes putting the letters down say: "Are you finished? Let's go on."

If the child experiences difficulty redirect using the phrases given above.

The examiner recorded the child's response and made pertinent comments about the child's performance after the testing session was over. For example, some children sounded out the words as they were spelling them

which appeared to assist them in choosing letters that were correct phonetic representations. After testing the Kindergarten children it was noted that a "j" should have been included for the phonetic spelling of "drip". A number of children asked for the "j" even though this had not occurred in the pilot testing.

Grade One Data Collection

The teachers were given a schedule (see Table 1) and instructions for administering the Spelling Test and collecting the Writing Samples. The package also contained student papers, envelopes and directions for returning the materials. The Spelling Test and Writing Samples were scheduled to be collected on Tuesday or Wednesday mornings to test children when they were not overly tired or restless. If all students in one classroom who were to be tested were present on Tuesday, testing went ahead on this day. If a child in the study was absent, the testing session for that class was postponed until Wednesday. If any one of the participating students was absent on Wednesday, testing went ahead and the absent child was eliminated from the study. This was done to keep the timing consistent between individuals and between schools. Three children were eliminated from the study as a result of absenteeism, and one student moved away. The testing was planned to be done by the teacher aide from each school, and the first two grade one data collections were collected by them. However, due to budget concerns, all teacher aides were subsequently laid off and so the individual teachers conducted the remaining testing sessions. The teachers were told that the students' spelling errors were of interest, so not to be concerned about them or offer added assistance.

Table 1

Schedule for Data Collection

Dates	Data Collected
June 16, 1983	Kindergarten Pretest
September 27 or 28, 1983	Writing Sample
October 17 or 18, 1983	Spelling Test and Writing Sample
November 8 or 9, 1983	Writing Sample ^a
November 29 or 30, 1983	Spelling Test and Writing Sample
December 12 or 13, 1983	Writing Sample ^b
January 3 or 4, 1984	Spelling Test and Writing Sample
January 24 or 25, 1984	Writing Sample
February 13 or 14, 1984	Spelling Test and Writing Sample

^a This writing sample was not collected due to a province-wide withdrawal of teacher services during that week.

^b According to the pattern of scheduling this writing sample should have been collected the following week but was collected one week early due to Christmas vacation.

Spelling Test administration.

The Spelling Test administration and directions followed the guidelines established by Beers (1974, p. 33) and Gentry (1977, p. 25). Each student was given a piece of paper with 18 numbered lines and the child's name and the test date printed on it. The following instructions were given to the teachers:

The following test should take no more than fifteen minutes. Arrange to have your children that are not to be tested working quietly on independent work.

Have your children to be tested arranged in the room so they cannot copy each other. They will need a pencil and eraser. Hand out sheets for spelling test and say:

"Today I will be asking you to spell some words. I want you to print the word by the number I say. When I say "Number 1" you will print the word on the line by the number 1. When I say "Number 2" you will print the word on the line by number 2 and so forth."

"You may know the word and be able to spell it easily. Many of the words are hard to spell and you may not be sure of how to print them. When this happens I want you to think of how a word may be printed and spell it as best you can. Each time I want you to write as much of the word as you can by thinking about it. I will say each word twice and use it in a sentence. Then as you print the word I will say it a third time. I want you to work quietly by yourself. Ready?"

If the students have any questions or are unclear you can repeat any of the above instructions.

Say each word clearly. Wait a few seconds and repeat it. Wait a few seconds and say it in a sentence. As they are printing say it one more time. If they are distressed say "Just think about the word and spell it as best you can."

E.g., "Number 1....map....map....A map is a handy thing to have in a strange city....map".

The children were given a break and then continued with the Writing Sample section of the data collection. This same test was repeated at the scheduled times throughout the six month period. This follows Beers' (1974) procedure. (See Appendix D for a complete list of the test words and sentences.)

Writing Sample collection.

To collect Writing Samples the following information was given to the teachers:

On days that I have designated to give the spelling test give the children a break and proceed with this section. On the days that I have designated to collect writing samples only, start with this section.

Children will need a pencil, eraser and crayons.

Hand out the half-and-half sheets to them.

"This page is for you to draw a picture and print a message of something you would like to tell me about. Draw and colour your picture on the top half of the page without the lines. (Show them). After you have finished your picture I want you to print a message under the picture where the lines are (Show them). Spell your message about the picture the way you think it may be printed."

If they are experiencing difficulty repeat any of the above instructions. If someone is really stuck ask him/her what the picture is about and say "Print what you said the way you think it may be printed."

This shouldn't take much longer than 15 to 20 minutes. Please ask the children what their message says and print their message on the back of the sheet.

Scoring

Spelling Strategy Classification System.

The students' spelling attempts were classified according to the spelling classification system developed by Gentry (1977) and adopted from the studies of Beers (1974) and Read (1971, 1975). Five sequential spelling strategies made up the classification system: precommunicative, semiphonetic, phonetic, transitional and correct. Gentry (1982) changed the term "deviant" that he had used in his previous study (1977) to "precommunicative" because the term "deviant" implies that using this spelling strategy is somehow unusual or that it deviates from what is normal for children. In reality, this is a natural strategy for early writers to use. Gentry (1982) also changed the term "prephonetic" to "semiphonetic" so as not to confuse the term with precommunicative. The

terms "precommunicative" and "semiphonetic" have been used in this study. The following guidelines adapted from Gentry (1977, p.19, 20, 22), were used to classify the spelling attempts of children both in their independent writing and on their test words:

1. Correct strategy. The entire word in which the feature in question is represented is spelled correctly. This shows recall of the correct lexical representation.

2. Transitional strategy. The word in which the feature in question is represented "looks like" an English word. The characteristics of the English orthographic system are indicated (i.e., vowels in every syllable, marking with "e", use of digraphs). Some letters may be reversed or the rules may be applied inaccurately. The transitional strategy satisfies at least one of these three requirements:

(a) The feature is spelled incorrectly but with a phonetically acceptable letter sequence. (i.e., "perred" for "purred", "toob for tube").

(b) The feature is spelled with the correct letters but they are out of order. (i.e., "eagel" for "eagle", "monstre" for "monster").

(c.) The feature is spelled correctly but other parts of the word are spelled incorrectly. (i.e., "dregon" for "dragon", "pirred" for "purred").

(d.) Extra or double letters are put in words (i.e., "draqqon" for "dragon").

3. Phonetic strategy. The word is represented phonetically on the basis of letter names which best represent the surface sounds of the word. Unlike transitional spellings, phonetic spellings do not typically resemble English words. The letters are arranged on the basis of sound without regard for the conventions of English spelling such as marking with "e",

digraphs, vowels in every syllable. Usually vowels are included in the spellings but may not be if a consonant sounds like a vowel. (i.e., "kr" for "car" because the "r" has the sound of "ar", "drs" for "dress" because the "s" has the sound for "ess"). The letter names for "f", "l", "m", "n", "s" sound like they have a vowel before them so often the children omit the vowel in words like "dress" or "bell" or "ten". Of the test words only "dressing" fits into this category but some of the words used in student Writing Samples reflect this.

4. Semiphonetic strategy. The essential feature of a semiphonetic spelling is that the feature under question has been omitted. However, there is a difference between semiphonetic spelling and phonetic spelling for r-controlled vowels, syllabic sonorants, preconsonantal nasals and spelling with "f", "l", "m", "n", "s". In the phonetic spelling of these features, a letter is omitted because some other letter is functioning in its place to represent a sound. For example, in the phonetic spelling of "car" as "kr", the child's use of the "r" and the omission of the vowel is a logical choice and phonetically is a correct representation. However, omitted letters at the semiphonetic stage do not represent logical choices and correct representations. They do contain the basics of a phonetic system, such as beginning and ending consonants but they do not represent the surface sound structure of a word. The basic criterion for a semiphonetic spelling is that the phonetic feature in question has not been represented. (i.e., "lpt" for "limped", "pr" for "purred", "bm" for "bottom"). Often semiphonetic spellers use one, two, or three letters to represent a word and omit the vowel.

5. Precommunicative strategy. This spelling classification defines any spelling patterns not described by classifications 1 through 4. These spelling patterns can range from scribbles, to numbers, to well marked letter units which do not bear any resemblance to the word (i.e., "gkr" for "bike").

In using the Spelling Classification System the developmental sequence was reversed. Once a word satisfied the criteria for a given spelling strategy then the remaining strategies did not need to be considered. For example, if a word was spelled correctly, there was no need to check the remaining categories to see if it could be classified as transitional, phonetic, semiphonetic or precommunicative.

Scoring of the Kindergarten Pretest.

The Kindergarten Pretest was used to get a measure of the students' spelling ability before formal reading instruction. Rather than score each feature independently, as was the case for the Grade One Spelling Test and Writing Samples, the students' overall performance was assessed. The comments of the student while being tested, the anecdotal comments of the examiner and the actual spelling of the words were all used for information. The students were then assigned a spelling strategy classification that they appeared to be primarily using at this time.

Scoring of the Grade One Spelling Test and Writing Samples.

From the Grade One Spelling Test and Writing Samples, each phonetic feature was scored independently, even in words containing more than one of the phonetic features being examined. Thus, a word might be classified as

semiphonetic for one feature and transitional for another. For example, "drag" for "dragon" would be considered semiphonetic for the syllabic sonorant /ən/ because the child omitted it but transitional for the affricate /dr/ and the vowel /æ/ because both of these were represented correctly in a word that was not totally correct (thus satisfying criteria (c) under transitional strategy). However, it was found that spelling attempts that were scored as "precommunicative" and spelling attempts that were scored as "correct" would be scored as such for all features in the word. For example if a student spelled "purred" as "xky", this spelling would be scored as precommunicative for the r-controlled vowel /ər/ and the ed-ending /d/. Likewise, if a student spelled "purred" as "purred", this spelling attempt would be scored as correct for the r-controlled vowel /ər/ and the ed-ending /d/. The students did spell the features using intermixtures of two or three strategies but usually the spelling of a word would indicate use of one strategy.

1. Scoring of Spelling Test. The students' spelling attempts were classified according to which spelling strategy was used for each phonetic feature. The scores for each spelling strategy were then charted for each student and each phonetic feature. Appendix E shows an example of a spelling test for one child. (See Table 2 and Table 3 for examples.)

2. Scoring of Writing Samples. The Writing Samples of each student were analyzed to locate the phonetic features being studied. Only those phonetic features being studied were assigned a spelling strategy classification. (See Appendix E for an example of a Writing Sample.) These scores were then charted for each individual child and each phonetic feature. (See Table 4 and Table 5 for examples.)

Table 2
 Example of Charting of Spelling Strategies Used
 From Spelling Test for One Student

Feature	Word	Oct. 17					Nov. 30					Jan. 4					Feb. 16					
		PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	
Tense vowel	/θ/ ltrade																					
	/i/ leagle																					
	/ay/ lbike																					
	/o/ lroad																					
	/u/ ltube																					
Lax vowel	/æ/ lmap																					
	/æ/ ldragon																					
	/ɛ/ lget																					
	/ɛ/ ldressing																					
	/i/ llip																					
	/i/ lliaped																					
	/ə/ lhot																					
	/ə/ lmonster																					
Preconsonantal nasal	/n/ lmonster																					
	/n/ lliaped																					
	/ŋ/ ldressing																					
Syllabic sonorant	/m/ ldragon																					
	/m/ lbottom																					
	/l/ leagle																					
ed-ending	/t/ lliaped																					
	/d/ lpurred																					
	/d/ ldusted																					
r-controlled vowel	/ər/ lpurred																					
	/ər/ lmonster																					
	/ər/ lcar																					
Affricate	/dr/ ldragon																					
	/dr/ ldressing																					
	/tr/ ltrade																					
Intervocalic flap	/d/ lbottom																					
Frequency		0	3	13	11	4	0	0	13	14	4	0	0	11	16	4	0	0	17	16	0	

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

Table 3

Example of Charting of Spelling Strategies Used
From Spelling Test for a Phonetic Feature

Feature	Oct. 17					Nov. 30					Jan. 4					Feb. 14				
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C
Tense vowel /e/																				
Subject # 1			*					*					*					*		
2		*					*					*					*			
3			*				*					*					*			
4			*				*					*					*			
5		*					*					*					*			
6		*					*					*					*			
7			*					*					*					*		
8			*					*					*					*		
9		*				*					*					*				
10			*			*						*					*			
11			*				*					*					*			
12			*				*					*					*			
13			*				*					*					*			
14			*				*					*					*			
15		*					*					*					*			
16			*				*					*					*			
17			*				*					*					*			
18			*				*					*					*			
19		*					*					*					*			
20			*				*					*					*			
21			*				*					*					*			
22			*				*					*					*			
23	*						*					*					*			
24		*					*					*					*			
25	*						*					*					*			
26			*				*					*					*			
Frequency	2	7	17	0	0	1	3	22	0	0	1	2	21	1	1	1	0	8	1	16

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

Table 4

Example of Charting of Spelling Strategies Used

From Writing Samples for One Student

Factors	Sept. 27				Oct. 17				Nov. 26				Dec. 13				Jan. 6				Jan. 24				Feb. 14				
	K	C	P	T	C	R	S	P	T	C	R	S	P	T	C	R	S	P	T	C	R	S	P	T	C	R	S	P	T
Yeast (vowel)	/r/																												
	/i/																												
	/e/																												
	/a/																												
Lat vowel	/e/																												
	/i/																												
	/a/																												
	/u/																												
Phonological																													
manip.																													
Syllabic consonant																													
	/m/																												
	/n/																												
	/l/																												
Blending																													
	/m/																												
	/n/																												
Controlled vowel																													
(ep)																													
(ep)																													
M/Tricks																													
	/r/																												
	/r/																												
Interchange (lip)																													
	/u/																												
Frequency	0	3	1	3	0	2	0	1	1	0	1	1	3	5	0	2	1	2	11	0	2	1	1	1	1	1	1	1	
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)

Numbers in parenthesis indicate total number of occurrences of the phonetic features being studied from Writing Samples.

Table 5

Example of Charting of Spelling Strategies Used
From Writing Samples for a Phonetic Feature

Feature (vowel /v/)	Sept. 27		Oct. 17		Nov. 28		Dec. 13		Jan. 4		Jan. 24		Feb. 14	
	R	C	R	C	R	C	R	C	R	C	R	C	R	C
Subject 9														
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
Frequency	5	3	1	1	4	2	0	2	1	2	1	0	1	1
	(13)		(7)		(6)		(8)		(12)		(9)		(10)	

Numbers in parenthesis indicate total number of occurrences of the phonetic feature being studied from Writing Samples.

3. Analysis of scores from Spelling Test and Writing Samples. Total scores were computed for each spelling strategy classification for each child and for each feature from words from the Spelling Test and words from the Writing Samples. Percentage scores were then computed for the use of each spelling strategy classification. The percentage scores for each spelling strategy used for the Spelling Test words and the words from the Writing Samples provided data that could be graphed over time to see the changes in the students' spelling attempts.

CHAPTER IV

Results

This chapter includes a description of the data collected from the Kindergarten Pretest, the Grade One Spelling Test and the Grade One Writing Samples. The percentages of spelling attempts for each spelling strategy classification have been summarized in histograms to show visually the changes in the students' spelling over time. The spelling classification system follows a developmental sequence with precommunicative, semiphonetic, phonetic and transitional strategies coming before correct spelling. Therefore, precommunicative and semiphonetic strategies are often discussed together as the strategies which precede phonetic spelling, and transitional and correct strategies are often discussed together as the strategies which indicate more spelling knowledge that follow phonetic spelling. The findings from the Kindergarten Pretest, the Grade One Spelling Tests and Grade One Writing Samples are discussed in self-contained sections. As well, in the Writing Sample section the results for each topic are described and briefly compared to the results in the corresponding Spelling Test section.

Kindergarten Pretest

The spelling strategies that the students used for the seven words from the Kindergarten Pretest are summarized in Table 6.

Table 6
 Summary of Spelling Strategies Used For
 The Kindergarten Pretest Across Schools

	PC	SP	P	T	C
School 1	2	5	3	0	0
School 2	1	5	2	0	0
School 3	1	5	2	0	0
Total Number of Students	4	15	7	0	0
Percentage of Students ^a	15	58	27	0	0

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

^aPercentage scores are rounded to the nearest whole number.

The students used spelling strategies that were either precommunicative, semiphonetic or phonetic, with 73% of students using precommunicative or semiphonetic strategies and none using transitional or correct. This trend was consistent across all three schools.

Grade One Data Collections

In this section the findings from the Grade One Spelling Test are discussed. First the four data collections for the Grade One Spelling Test from the three schools in the study are described. The performance of the individual schools are then discussed. Finally, the spelling strategies used for the individual phonetic features are reported.

Spelling Test

The data collected from the testing sessions for the Grade One Spelling Test across the three schools involved in the study are summarized in Figure 1. Students relied more on use of the phonetic strategy than any other one spelling strategy until February when use of transitional and correct strategies joined with the phonetic strategy to be used almost equally. In October, 37% of the spelling attempts were precommunicative or semiphonetic and only 20% of the spelling attempts were transitional or correct. In contrast, in February only 2% of the spelling attempts were precommunicative or semiphonetic, and 67% were transitional or correct.

Performance of individual schools on Spelling Test.

Figures 2, 3, and 4 summarize the data collected from the Spelling Test for each school. The trend of moving from using precommunicative, semiphonetic and phonetic spelling strategies to using transitional and correct spelling strategies is shown in each school. There was a heavy reliance on phonetic strategies in all three schools. This is especially apparent for students in School # 1 who continued to use phonetic strategies in February.

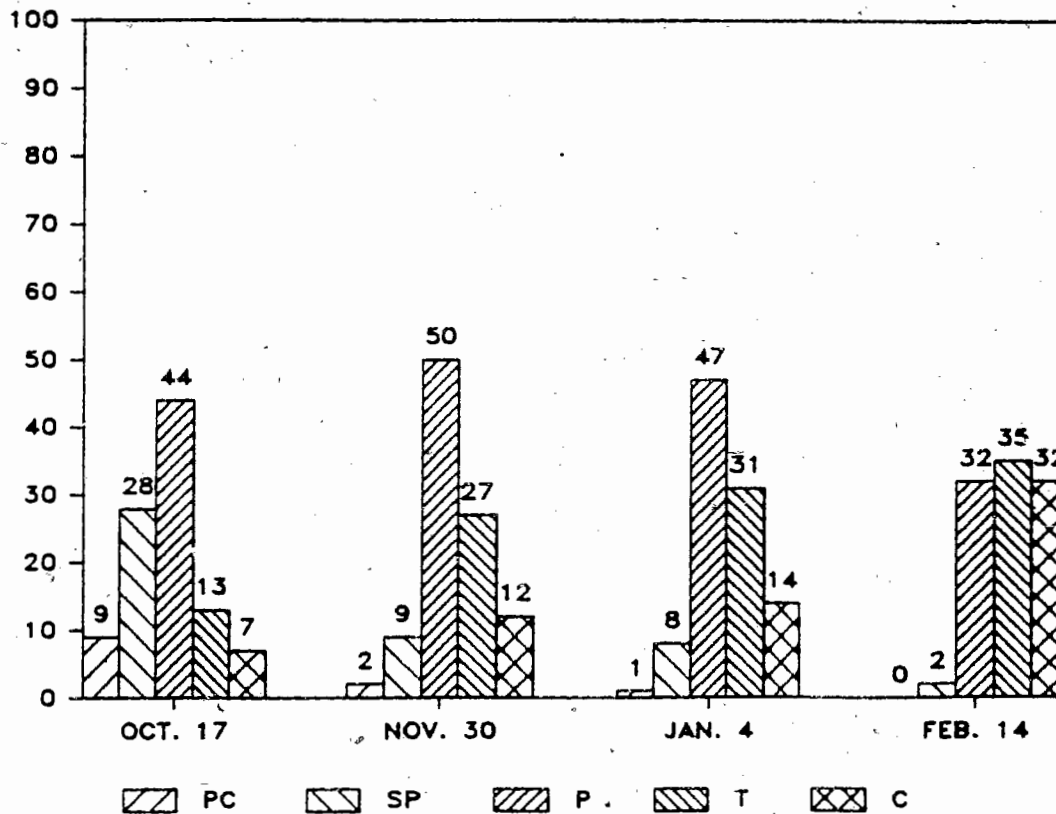


Figure 1. Histogram showing spelling strategies used from Spelling Test across schools (percentages).^a

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

^aPercentage scores are rounded to the nearest whole number.

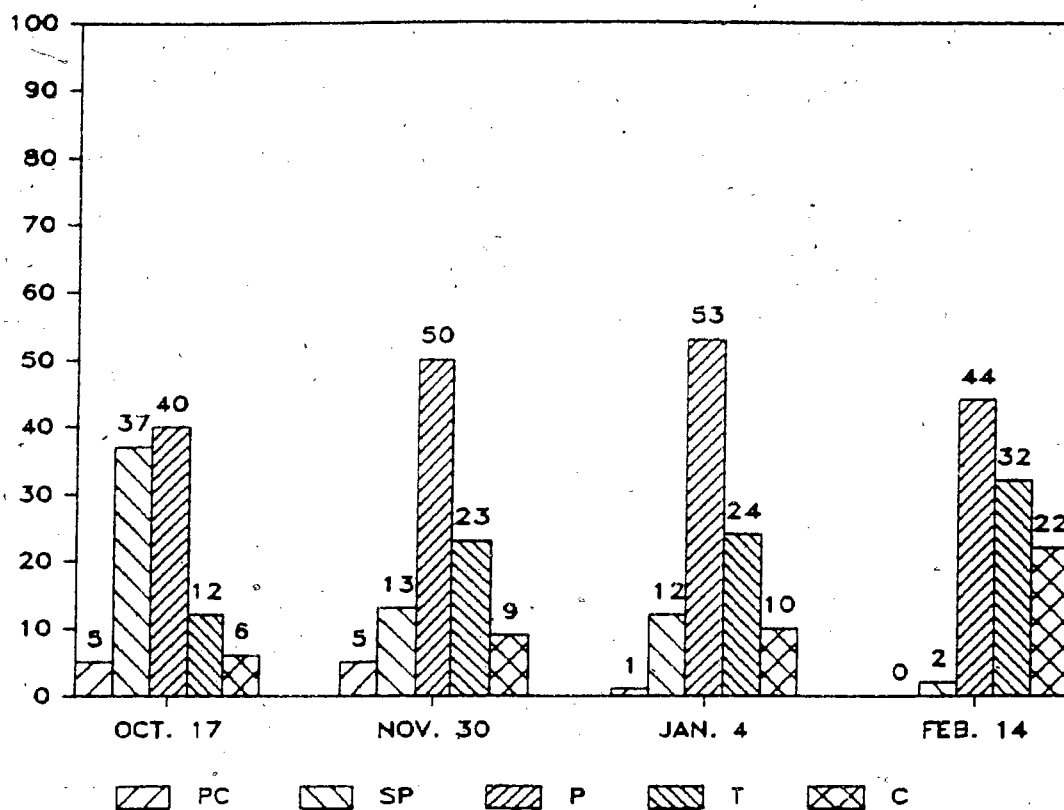


Figure 2. Histogram showing spelling strategies used for School # 1 from the Spelling Test (percentages).^a

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

^aPercentage scores are rounded to the nearest whole number.

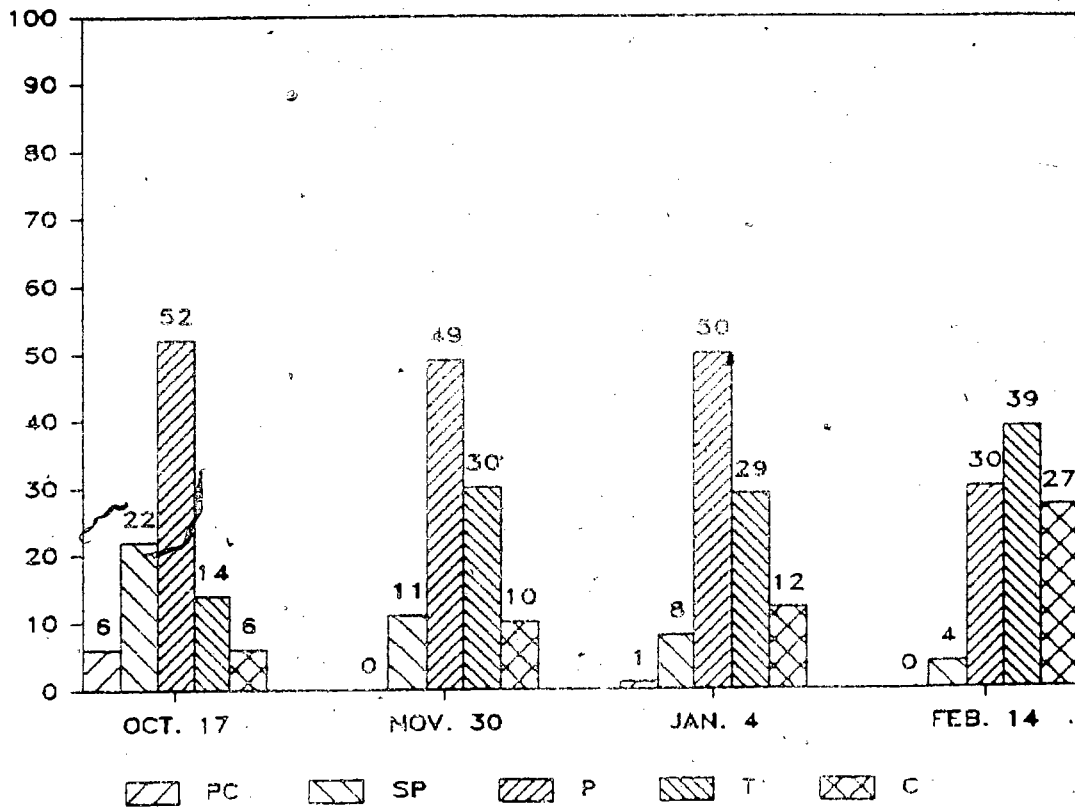


Figure 3. Histogram showing spelling strategies used for School # 2 from the Spelling Test (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

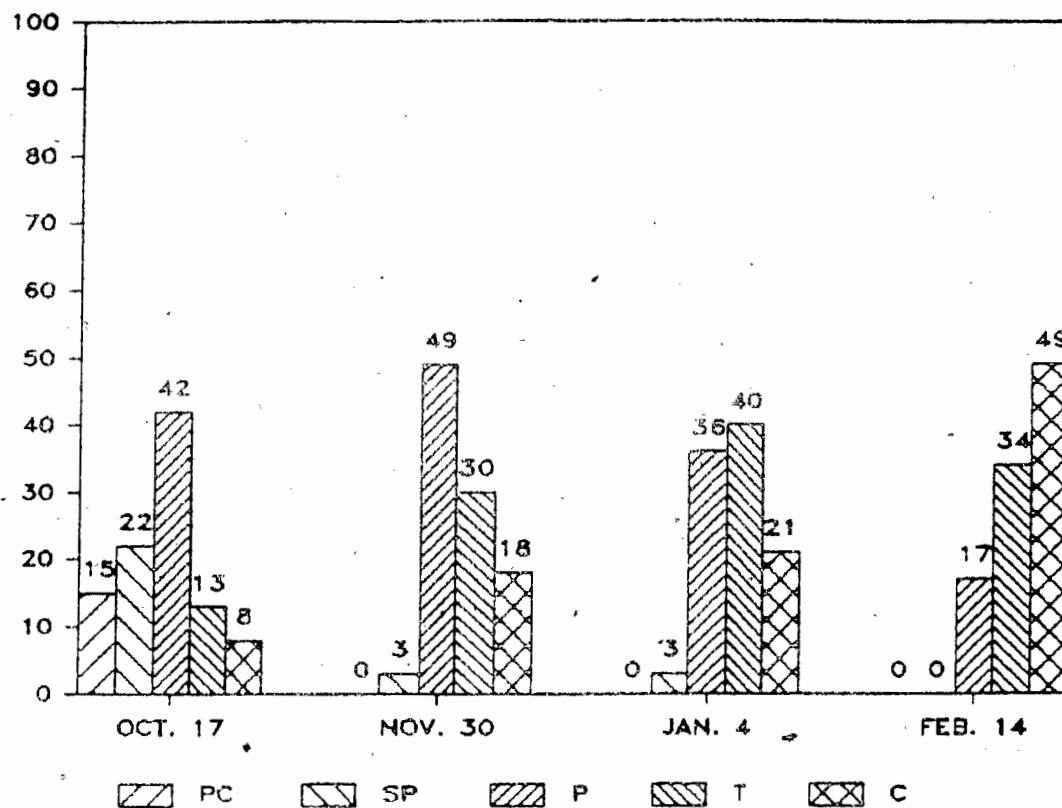


Figure 4. Histogram showing spelling strategies used for School # 3 from the Spelling Test (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

Students in School # 2 and School # 3 relied on phonetic strategies initially but moved away from these, particularly in February. In October, 42% of the spelling attempts of the students in School # 1 were precommunicative or semiphonetic while in February only 2% of their spelling attempts were classified as such. In October, only 18% of the spelling attempts of the students in School # 1 were transitional or correct while in February 54% of their spelling attempts were transitional or correct. The students in School # 2 relied heavily on phonetic strategies, but in February 66% of their spelling attempts were transitional or correct. In February, 49% of the spelling attempts of the students in School # 3 were correct with transitional and correct strategies together accounting for 83% of spelling attempts. This is in contrast to October when only 21% of their spelling attempts were transitional or correct. The students in School # 3 progressed to using more transitional and correct strategies sooner than the other schools.

Summary of spelling strategies used for phonetic feature categories on Spelling Test across schools.

1. Tense vowels. Figure 5 summarizes the spelling strategies used for spelling tense vowels on the Spelling Test. Prior to February students primarily used phonetic strategies to spell tense vowels: 73% of the tense vowel spelling attempts were phonetic in October, 82% in November, and 81% in January. In February 67% of the tense vowel spellings were classified as transitional and correct. This is in contrast to October when only 1% of the tense vowel spellings were classified as transitional or correct.

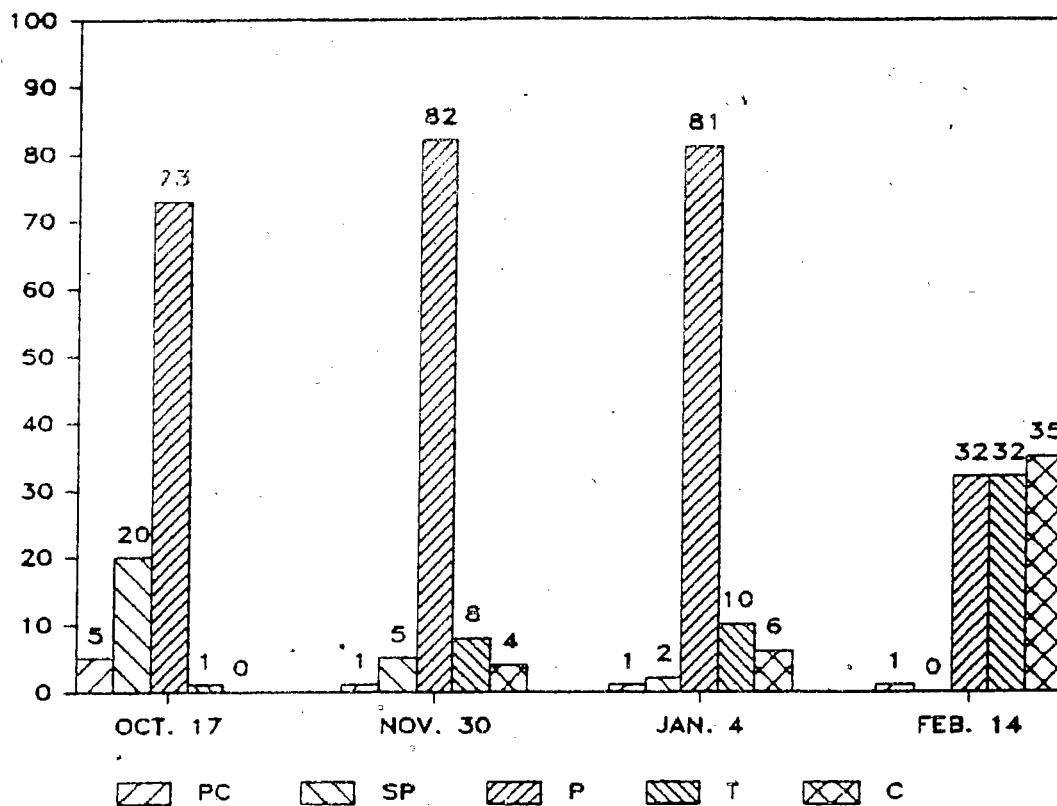


Figure 5. Histogram showing spelling strategies used for tense vowels from the Spelling Test across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

2. Lax vowels. Figure 6 summarizes the strategies used for spelling lax vowels on the Spelling Test. In October 55% of the spelling attempts for lax vowels were semiphonetic or phonetic while 36% of the spelling attempts were already transitional or correct. Lax vowels were relatively easy for students to spell in early testing. In February 87% of spelling attempts were transitional or correct. There were two words for each of the lax vowels, a one-syllable word and a two-syllable word. In considering the spelling of lax vowels in the one-syllable words separately, 40% of spelling attempts were correct in October, 69% were correct in November, 73% in January and 89% were correct in February. However, for spelling lax vowels in two-syllable words 0% of spelling attempts were correct both in October and in November, 2% were correct in January and 20% were correct in February. Spelling lax vowels in two-syllable words was more difficult for the students than spelling lax vowels in one-syllable words.

3. Preconsonantal nasals. Figure 7 summarizes the strategies used for spelling preconsonantal nasals on the Spelling Test. Students relied heavily on phonetic strategies throughout with 50% of the spelling attempts being phonetic in October, 58% in November, 62% in January, but in February 40% of the spelling attempts were phonetic while 45% were transitional. In October 49% of the spelling attempts were precommunicative or semiphonetic and in February only 5% were precommunicative or semiphonetic. However, only 10% of the spelling attempts for preconsonantal nasals were correct in February, indicating this feature was difficult for the students to get completely correct.

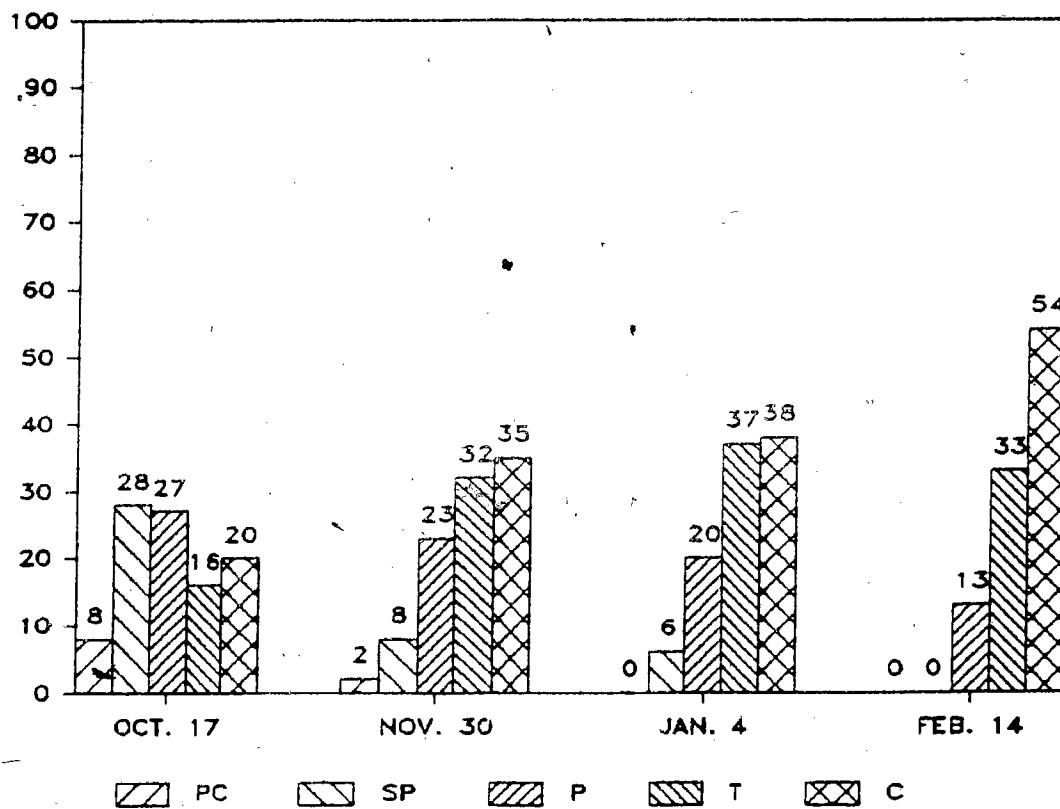


Figure 6. Histogram showing spelling strategies used for lax vowels from the Spelling Test across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

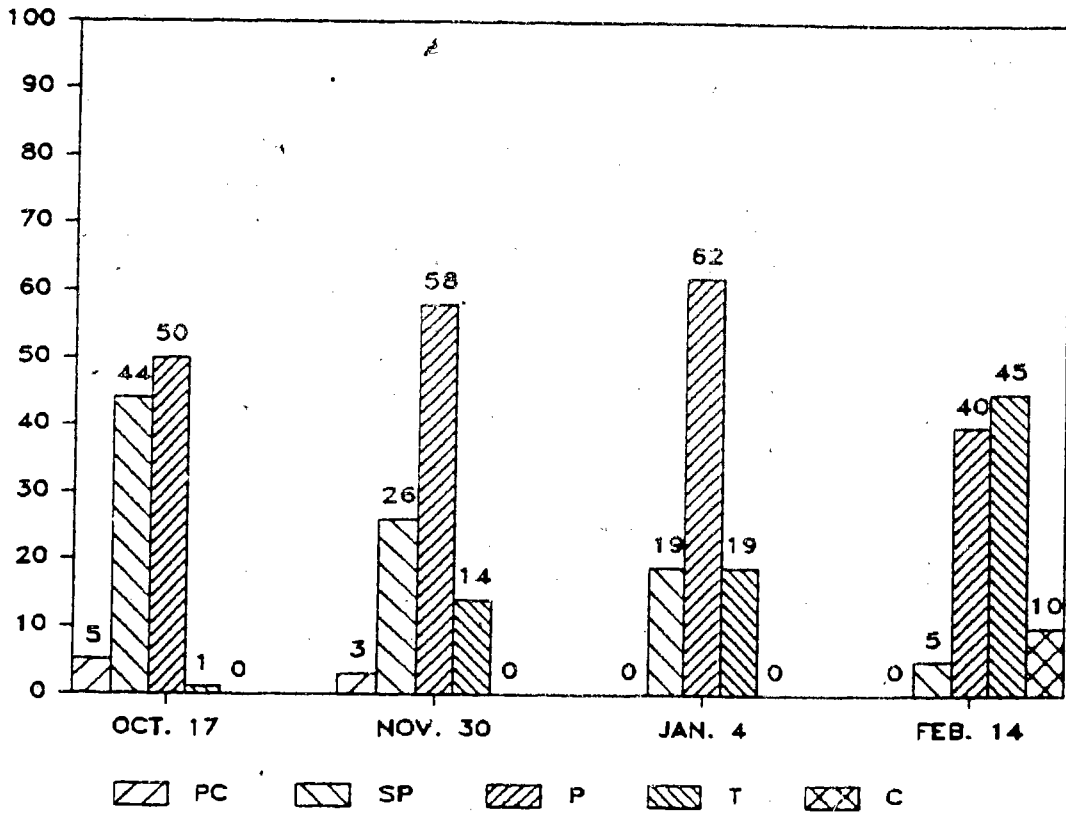


Figure 7. Histogram showing spelling strategies used for prenasals from the Spelling Test across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

4. Syllabic sonorants. Figure 8 summarizes the strategies used for spelling syllabic sonorants on the Spelling Test. Students relied heavily on phonetic strategies with 49% of spelling attempts being phonetic in October, 59% in November, 44% in January and 35% in February. In October, 39% of the spelling attempts were precommunicative or semiphonetic and only 13% were transitional or correct. In contrast, in February, only 3% of the spelling attempts were precommunicative or semiphonetic and 63% were transitional or correct.

5. Ed-endings. Figure 9 summarizes the spelling strategies used for spelling ed-endings on the Spelling Test. In October students primarily used precommunicative or semiphonetic strategies with 58% of the spelling attempts for ed-endings being classified as such. At later testings students relied more heavily on phonetic strategies with 90% of spelling attempts in November being classified as phonetic, 81% in January and 82% in February. Even at the February testing only 13% of the spelling attempts were transitional or correct, indicating this feature was difficult for students.

6. R-controlled vowels. Figure 10 summarizes the spelling strategies used for spelling r-controlled vowels on the Spelling Test. Students relied on phonetic strategies throughout: 52% of spelling attempts of r-controlled vowels were phonetic in October, 62% in November, 64% in January and 62% in February. Students began by using precommunicative or semiphonetic strategies for 33% of their spelling attempts for r-controlled vowels in October compared with 1% in February. Only 16% of spelling attempts were transitional or correct in October while 37% were transitional or correct in February.

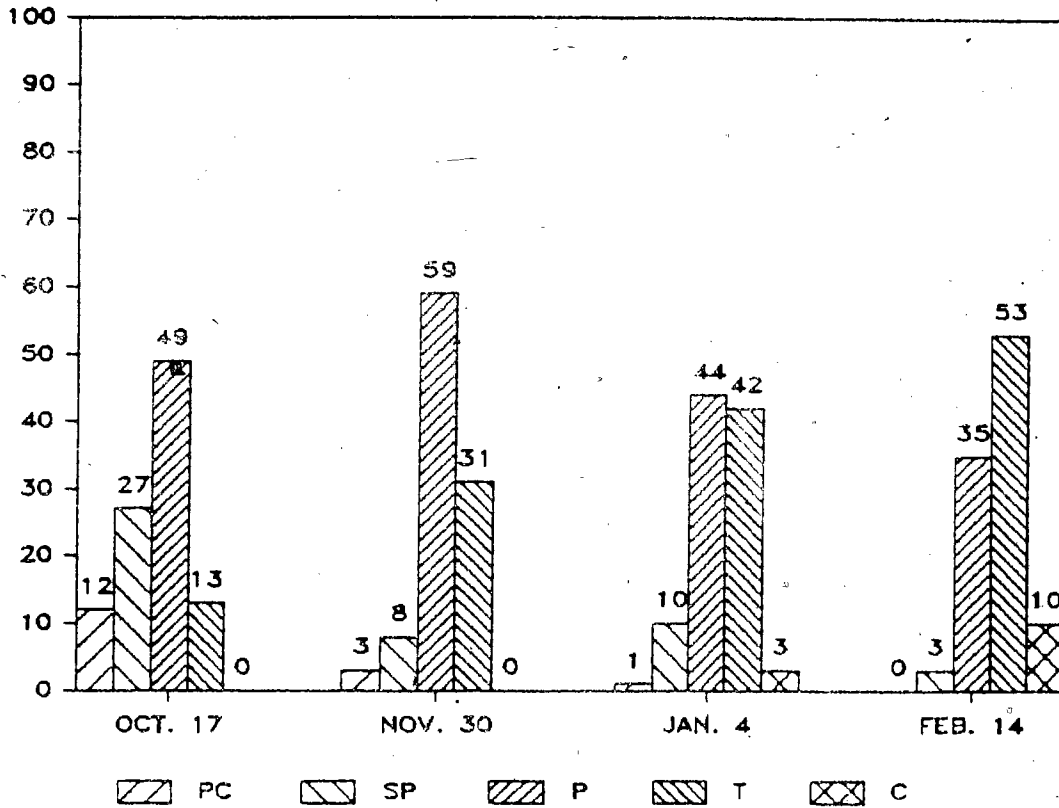


Figure 8. Histogram showing spelling strategies used for syllabic sonorants from the Spelling Test across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

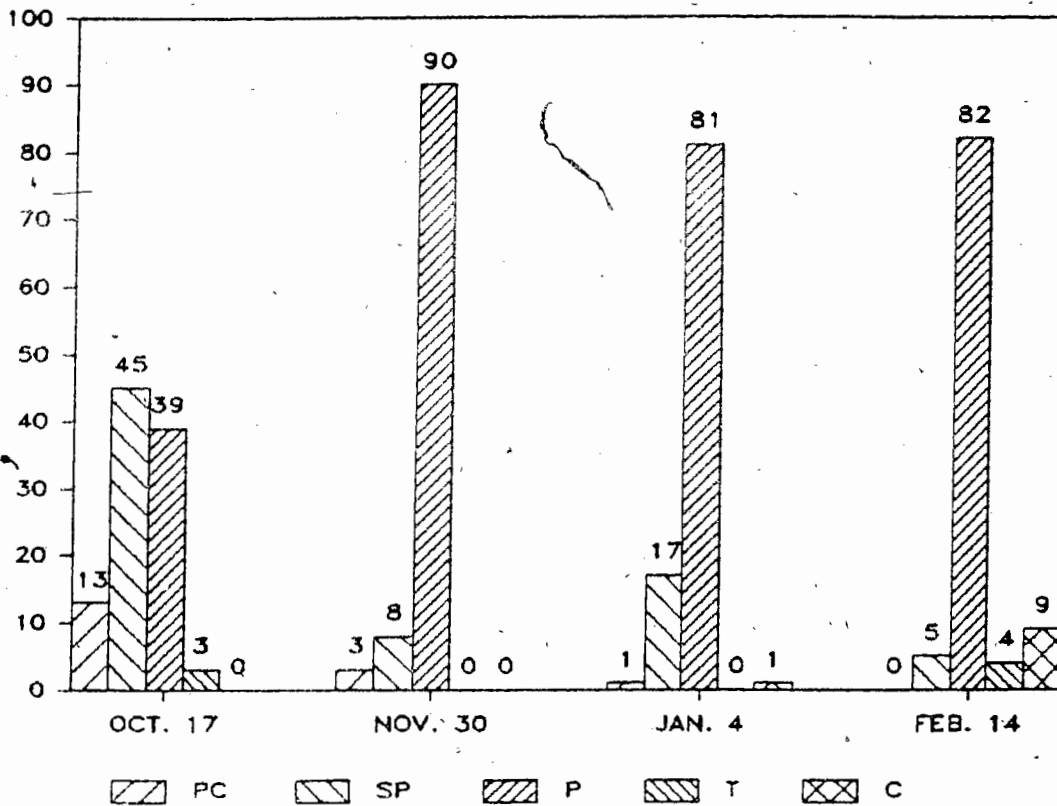


Figure 9. Histogram showing spelling strategies used for ed-endings from the Spelling Test across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic.
 P = Phonetic
 T = Transitional
 C = Correct

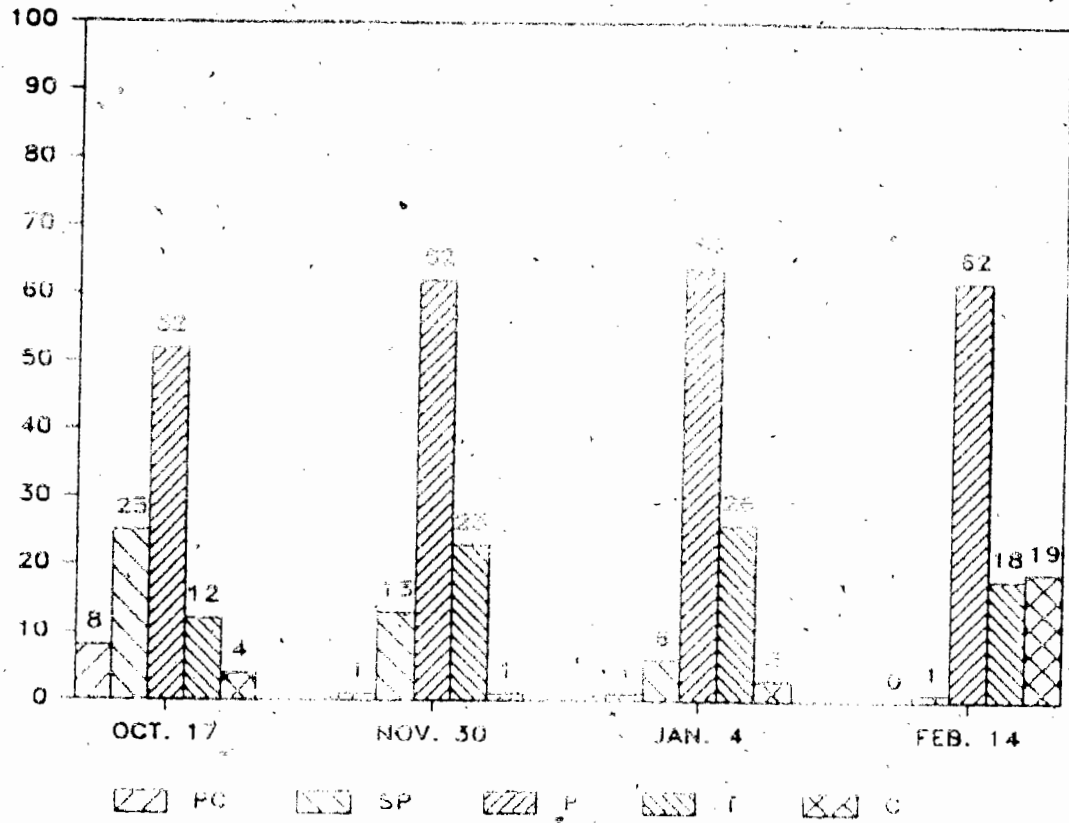


Figure 10. Histogram showing spelling strategies used for r-controlled vowels from the Spelling Test across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

7. Affricates. Figure 11 summarizes the strategies used for spelling affricates on the Spelling Test. Students began by primarily using phonetic strategies in October, with 53% of spelling attempts being classified as such. However, the phonetic strategy only accounted for 29% of the spelling attempts in November, 31% in January and 12% in February. In November and January transitional strategies were primarily used, with 63% of the spelling attempts being transitional in November and 62% in January. In February 84% of spelling attempts were transitional or correct.

8. Intervocalic flap. Figure 12 summarizes the strategies used for spelling the intervocalic flap from the Spelling Test. Students primarily used transitional strategies throughout, with 65% of spelling attempts being transitional in October, 89% in November, 85% in January and 96% in February. In October 31% of the spelling attempts were precommunicative or semiphonetic compared with 4% in February. However, there were no correct spelling attempts. There was only one word for this feature category which must have been too difficult to spell totally correctly.

In summary, from the results of the Spelling Test, lax vowels appeared to be the easiest phonetic feature for the students to spell correctly, while ed-endings and r-controlled vowels were the most difficult features. Tense vowels, preconsonantal nasals, syllabic sonorants and affricates were features that were of moderate difficulty for the students. The intervocalic flap was unique in that students primarily used transitional strategies to spell it throughout the testing period but there was little improvement or change.

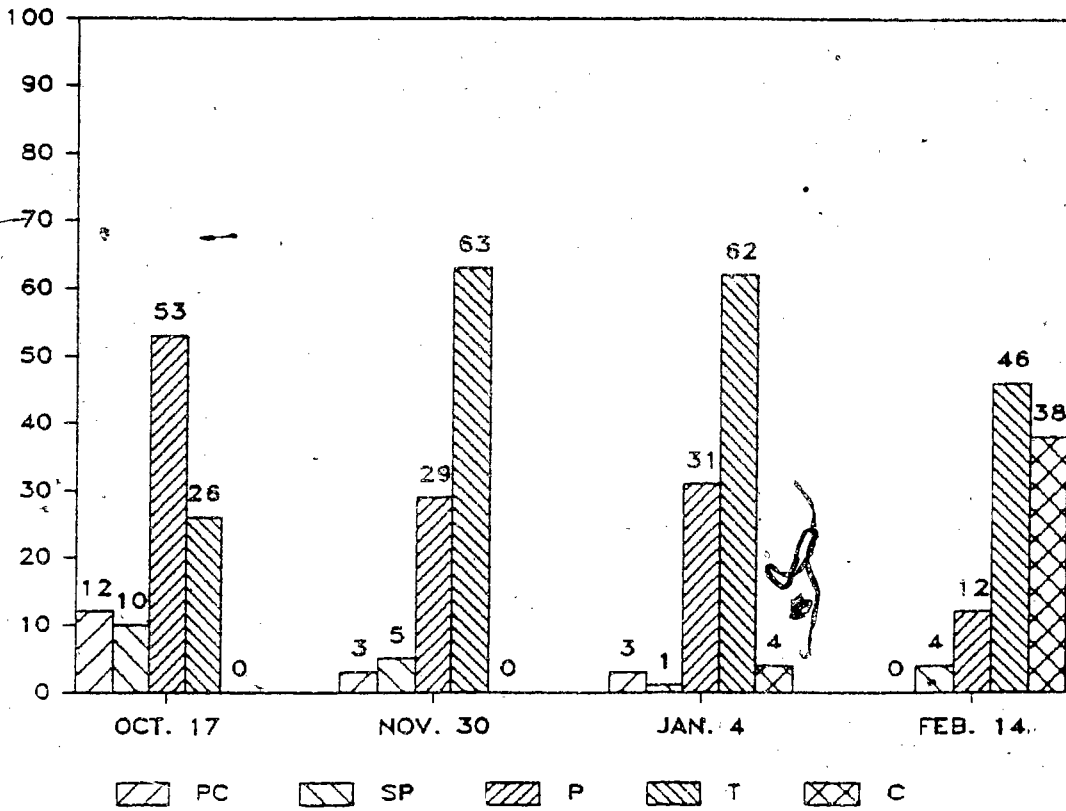


Figure 11. Histogram showing spelling strategies used for affricates from the Spelling Test across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

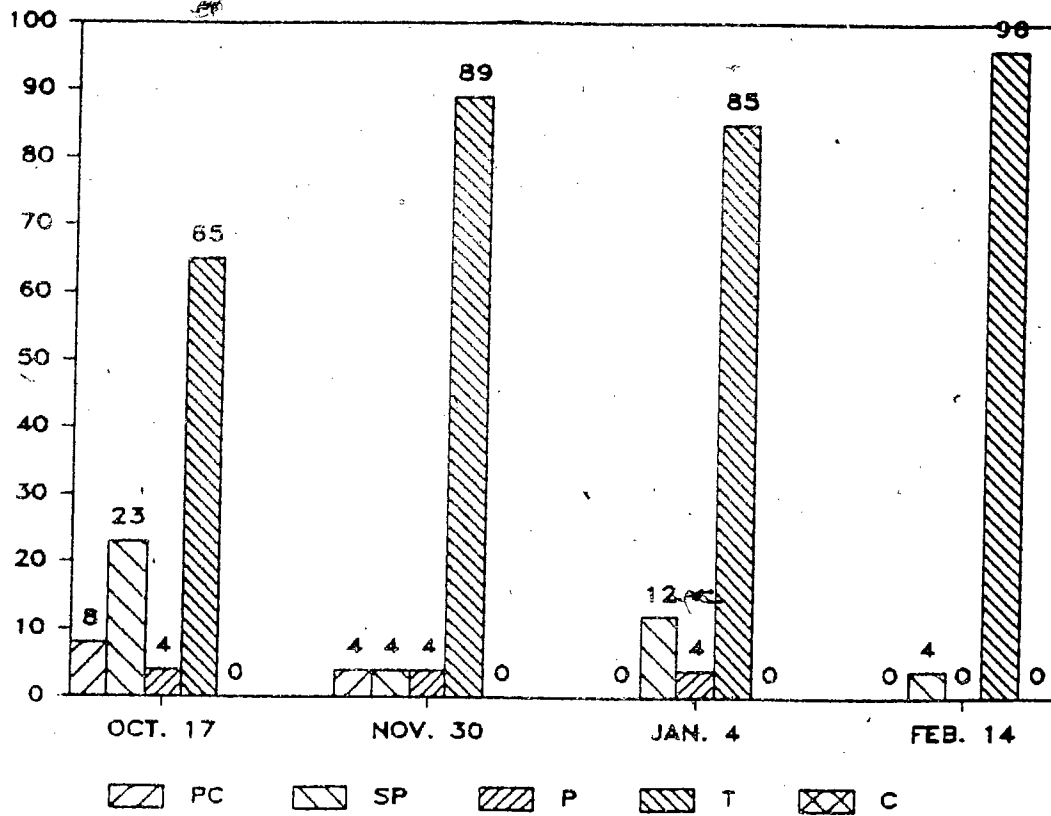


Figure 12. Histogram showing spelling strategies used for intervocalic flap from the Spelling Test across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

Writing Samples

In this section the spelling strategies used on Writing Samples for all schools will be discussed followed by a brief description of the trends shown for each individual school. The spelling strategies used for each phonetic feature category will also be discussed. For each section, there will be a brief description of the spelling strategies used for the Writing Samples as compared with the spelling strategies used on the Spelling Test to see if the trends from both methods of data collection are similar.

Figure 13 summarizes the spelling strategies used in the Writing Samples. Students begin by using mostly precommunicative or semi-phonetic strategies, with 52% of spelling attempts being classified as such in September. Students later moved to using more correct strategies with 64% of spelling attempts being correct in February. In September precommunicative strategies were used more than any other one strategy, but they were used progressively less until after December when there was no evidence of the use of this strategy. From October through to February students relied on correct strategies more than any other one strategy. The increasing use of correct strategies shows children progressing in their spelling knowledge. From September to February, the total number of words examined, for the phonetic feature categories being studied, more than tripled, going from 222 in September to 672 in February (see Appendix F).

Table 7 gives a summary of the spelling strategies used for the Writing Samples as compared with the Spelling Test for corresponding data collection times. More spelling attempts were correct from the Writing Samples than from the Spelling Test. This could be because students chose to use words they already knew how to spell. When the use of spelling

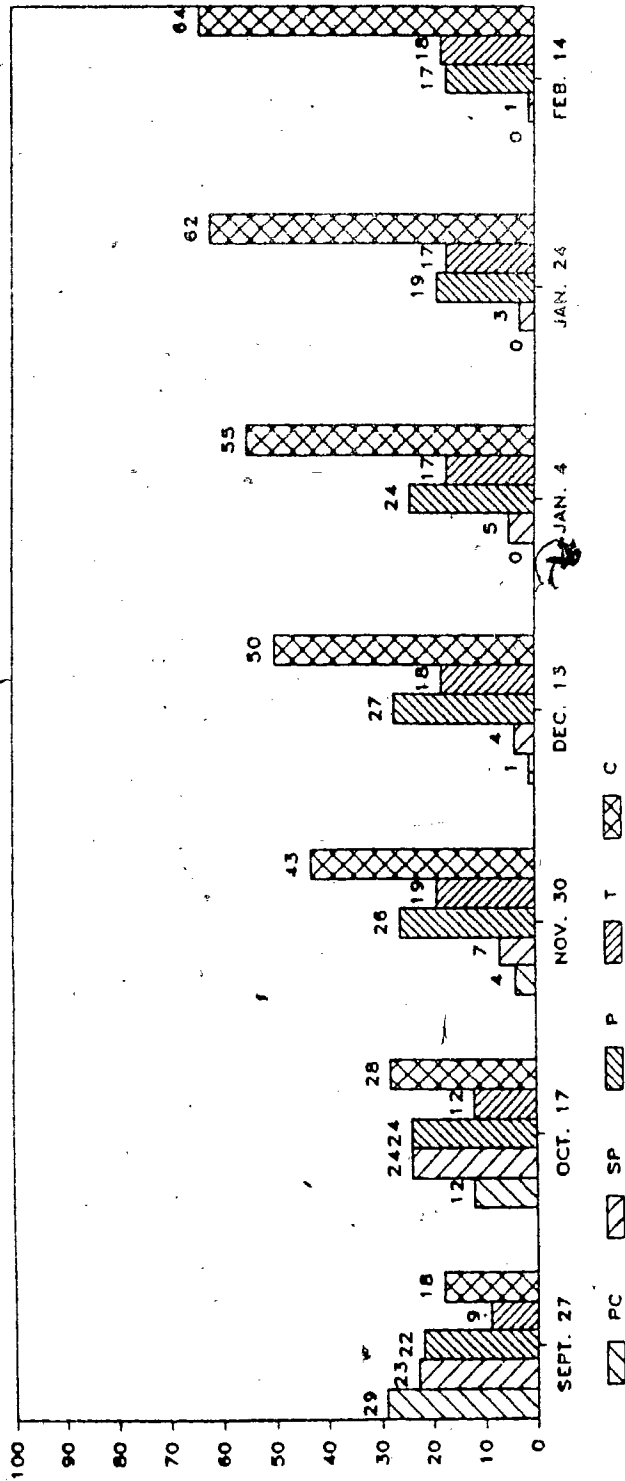


Figure 13. Histogram showing spelling strategies used from Writing Samples across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

strategies is examined, it can be seen that more spelling attempts were phonetic from the Spelling Test than from the Writing Samples.

Table 7

Summary of Scores for Spelling Strategies Used From Writing Samples and Spelling Test Across Schools (Percentages)

	October 17					November 30					January 4					February 14				
Writing Sample	12	24	24	12	28	4	7	26	19	43	0	5	23	17	55	0	1	17	18	64
Spelling Test	9	28	44	13	7	2	9	50	27	12	1	8	47	31	14	0	2	32	35	32
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

Performance of individual schools from Writing Samples.

Figures 14, 15 and 16 summarize the spelling strategies used by the children within each school from the Writing Samples. The trend of moving from the use of precommunicative, semiphonetic and phonetic strategies to using transitional and correct strategies was indicated in all three schools. The students from School # 1 and School # 2 initially relied more heavily on precommunicative and semiphonetic strategies than did the students from School # 3. In September, the students from School # 1 had 58% of their spelling attempts classified as precommunicative or semiphonetic. The students from School # 2 had 62% while the students from School # 3 had 10%. Also the students from School # 3 began by primarily using correct strategies with 44% of their spelling attempts being classified as such. The students from School # 3 also began by using

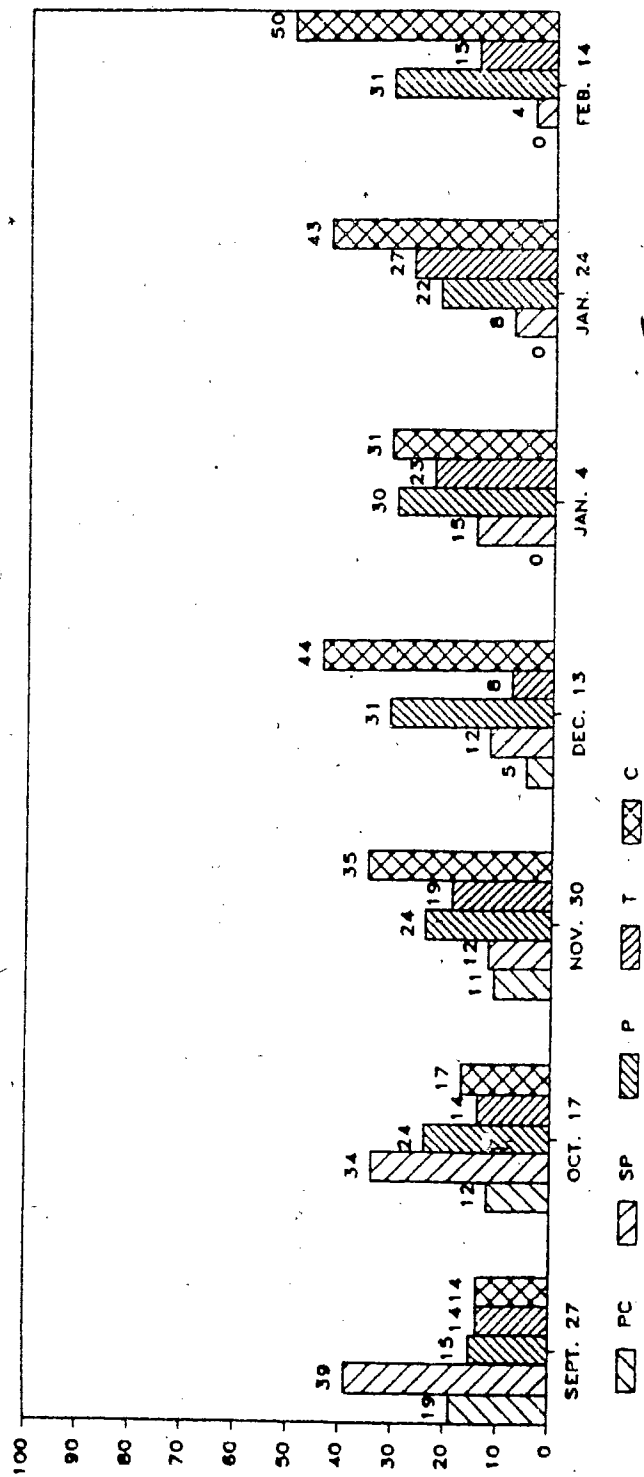


Figure 14. Histogram showing spelling strategies used for School # 1 from Writing Samples (percentages):

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

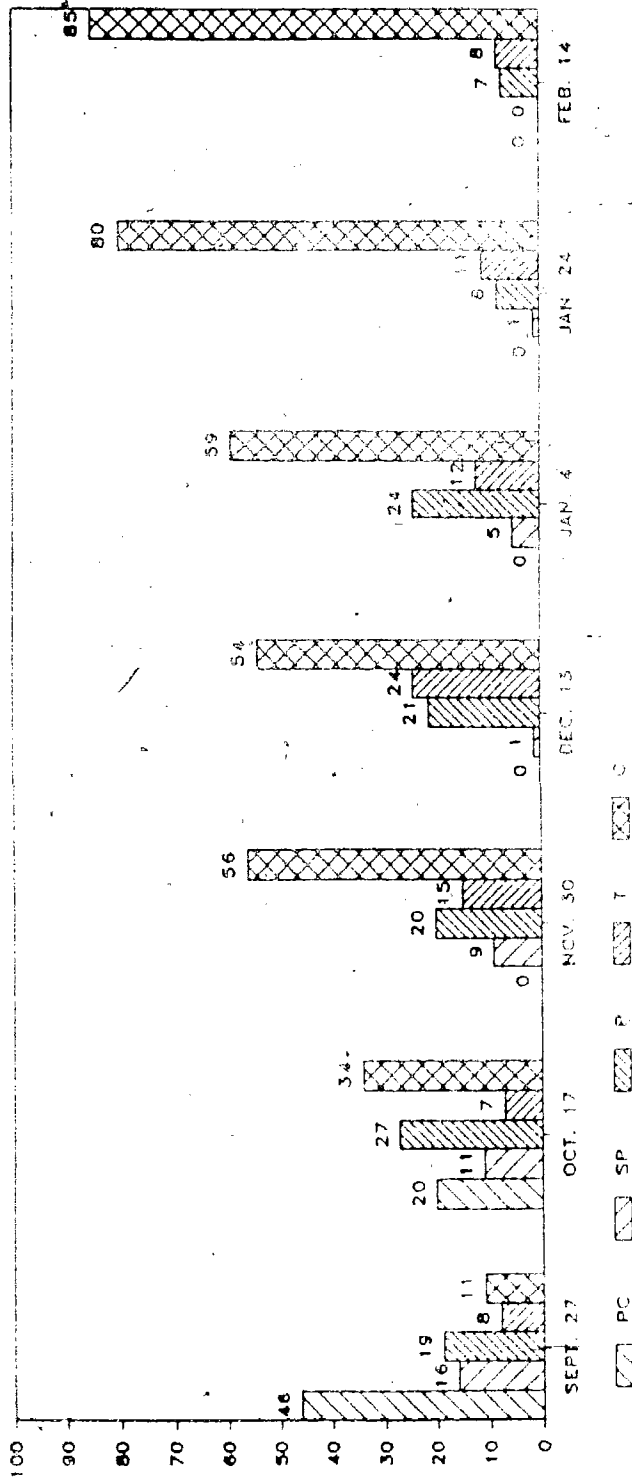


Figure 15. Histogram showing spelling strategies used for School # 2

from Writing Samples (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

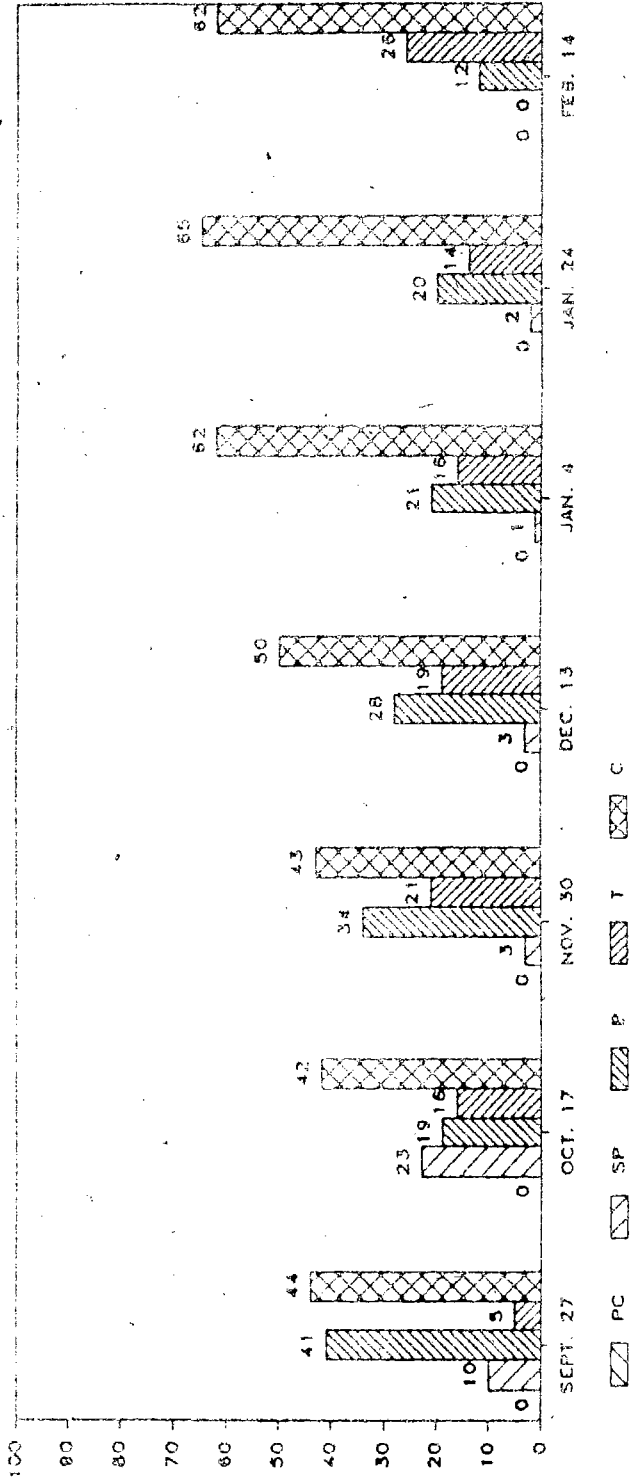


Figure 16. Histogram showing spelling strategies used for School # 3 from Writing Samples (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

phonetic strategies with 41% of spelling attempts in September being classified as such as compared to 19% for School # 2 and 15% for School # 1. In February students from all three schools were relying heavily on transitional and correct strategies. Students from School # 1 had 65% of their spelling attempts classified as transitional or correct, students from School # 2 had 93% of their spelling attempts classified as transitional or correct and students from School # 3 had 88% of their spelling attempts classified as transitional or correct. In February, students from School # 1 continued to rely on phonetic strategies for spelling. At this time 31% of the spelling attempts of the students in School # 1 were phonetic while only 7% from the students of School # 2 were phonetic and only 12% from the students in School # 3 were phonetic. The total number of spelling attempts for the phonetic features being studied went from 74 to 224 for School # 1, from 109 to 174 for School # 2 and from 39 to 274 for School # 3 (see Appendix F). Although School # 2 had a higher percentage of spelling attempts classified as transitional or correct in February, the total number of words was less than School # 1 and School # 3. However, in all three schools students wrote more and spelled what they wrote more conventionally as the year progressed.

Summary of spelling strategies used for phonetic feature categories
from Writing Samples across schools.

1. Tense vowels. Figure 17 summarizes the spelling strategies used for spelling tense vowels in the Writing Samples. There was a relatively even

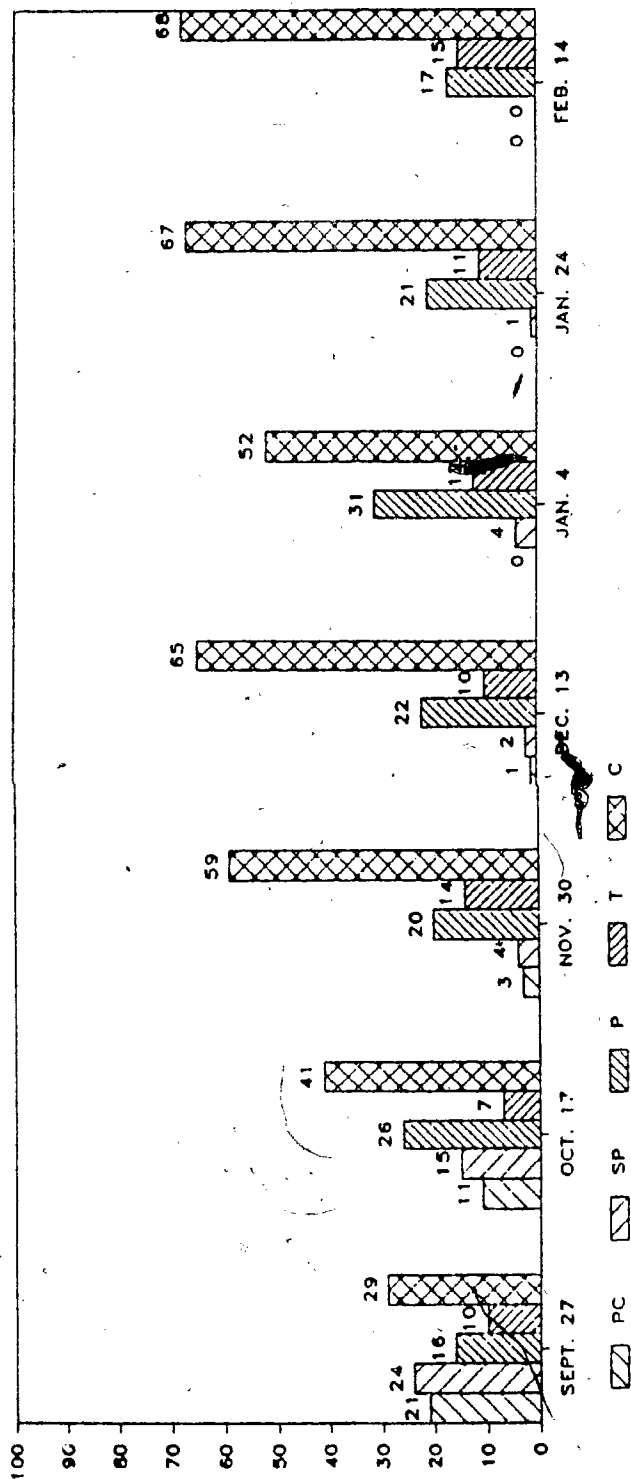


Figure 17. Histogram showing spelling strategies used for tense vowels from the Writing Samples across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

distribution of spelling attempts for tense vowels in all spelling classifications in September, with 45% of spelling attempts being precommunicative or semiphonetic. However, there was a noticeable move towards using correct strategies indicated as early as December. This trend became progressively more evident until in February, 0% of spelling attempts were in precommunicative or semiphonetic while 83% were transitional or correct. The frequency of use of tense vowels increased from 46 in September to 220 in February (see Appendix F).

Table 8 shows a summary of the spelling strategies used for spelling tense vowels from the Writing Samples as compared with the Spelling Test for corresponding data collection times. There were more correct spelling attempts from the Writing Samples than from the Spelling Test; and there were more phonetic spelling attempts from the Spelling Test than from the Writing Samples.

Table 8

Summary of Spelling Strategies Used for Tense Vowels from Writing Samples and Spelling Test Across Schools (Percentages).

	October 17					November 30					January 4					February 14				
Writing Sample	11	15	26	7	41	3	4	20	14	60	0	4	31	19	53	0	0	17	15	68
Spelling Test	5	20	74	1	0	1	5	82	8	4	1	2	81	10	6	1	0	32	32	35
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

2. Lax vowels. Figure 18 summarizes the spelling strategies used for spelling lax vowels from the Writing Samples. There was a relatively even

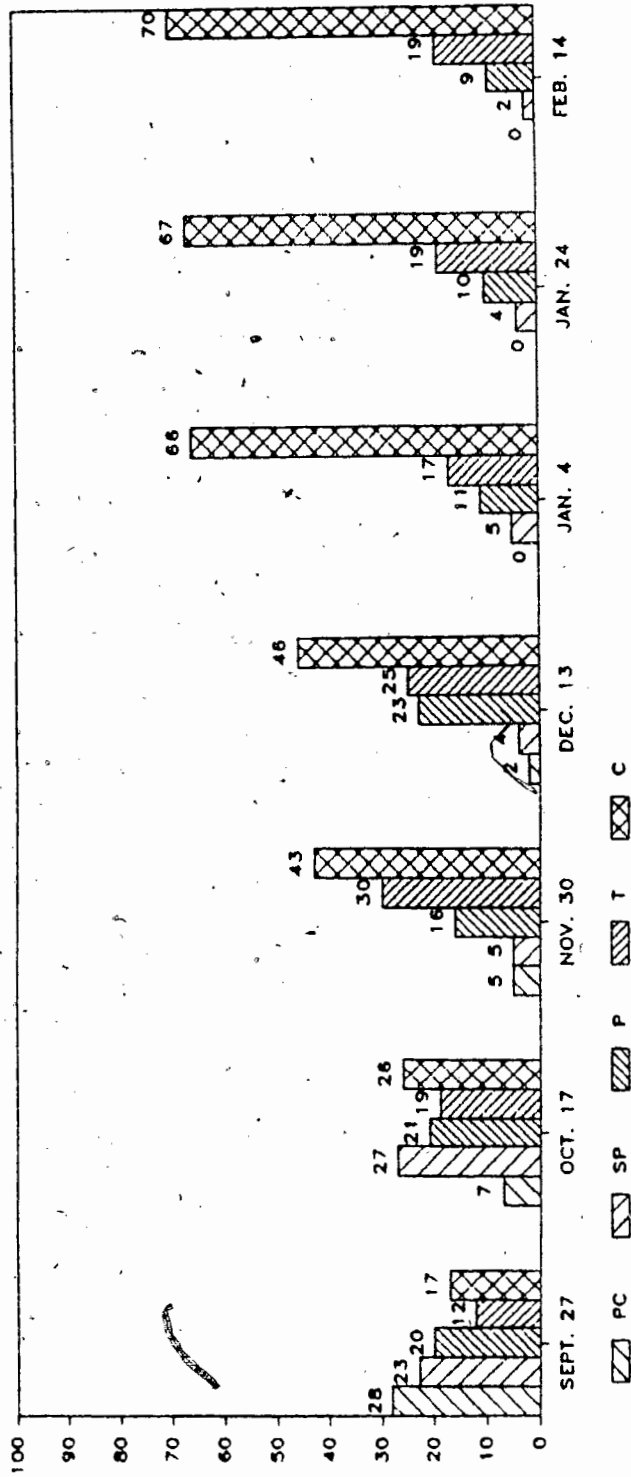


Figure 18. Histogram showing spelling strategies used for lax vowels from the Writing Samples across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

distribution of spelling attempts in all classifications in September. By December students moved to using more correct strategies and this trend became more evident until in February 89% of spelling attempts were transitional or correct as compared with 29% being classified as such in September. In September, 51% of the spelling attempts were precommunicative or semiphonetic with only 2% classified as such in February. The frequency of use of lax vowels in writing samples increased from 105 in September to 304 in February (see Appendix F).

Table 9 shows a summary of the spelling strategies used for spelling lax vowels on the Writing Samples as compared with the Spelling Test at corresponding data collection times. The percentage scores for lax vowels were very similar from both methods of data collection although there was a greater reliance on correct strategies in Writing Samples than on Spelling Test and while on the Spelling Test there was a greater reliance on phonetic strategies than in the Writing Samples.

Table 9.

Summary of Spelling Strategies Used for Lax Vowels from Writing Samples and Spelling Test Across Schools (Percentages).

	October 17					November 30					January 4					February 14				
Writing Sample	6	27	21	19	26	5	5	16	30	43	0	5	11	17	66	0	2	9	19	70
Spelling Test	8	28	27	16	20	2	8	23	32	35	0	6	20	37	38	0	0	13	33	54
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C

Note, PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

3. Preconsonantal nasals: Figure 19 summarizes the spelling strategies used for spelling preconsonantal nasals from Writing Samples. Students moved from using precommunicative, semiphonetic and phonetic strategies to using phonetic, transitional and correct strategies, with a heavy reliance on correct strategies being evident in January and February. In September 46% of the spelling attempts were precommunicative or semiphonetic in contrast to only 3% in February. In September 18% of the spelling attempts were transitional or correct in contrast to 73% in February. The frequency of use of preconsonantal nasals in Writing Samples increased from 25 in September to 98 in February (see Appendix F).

Table 10 - shows a summary of spelling strategies used for spelling preconsonantal nasals for the Writing Samples as compared with the Spelling Test at corresponding data collection times. There were more correct spelling attempts from Writing Samples than from the Spelling Test, but there were more phonetic spelling attempts from the Spelling Test than from the Writing Samples. In October there were more precommunicative spelling attempts from the Writing Samples than from the Spelling Test.

4. Syllabic sonorant. This feature was used too infrequently in Writing Samples to give a reliable measure of the spelling strategies used (see Table 11 and Appendix F). The frequency of use did not increase.

In the Spelling Test the spelling of this feature did not move to use of transitional or correct strategies but remained predominately phonetic throughout.

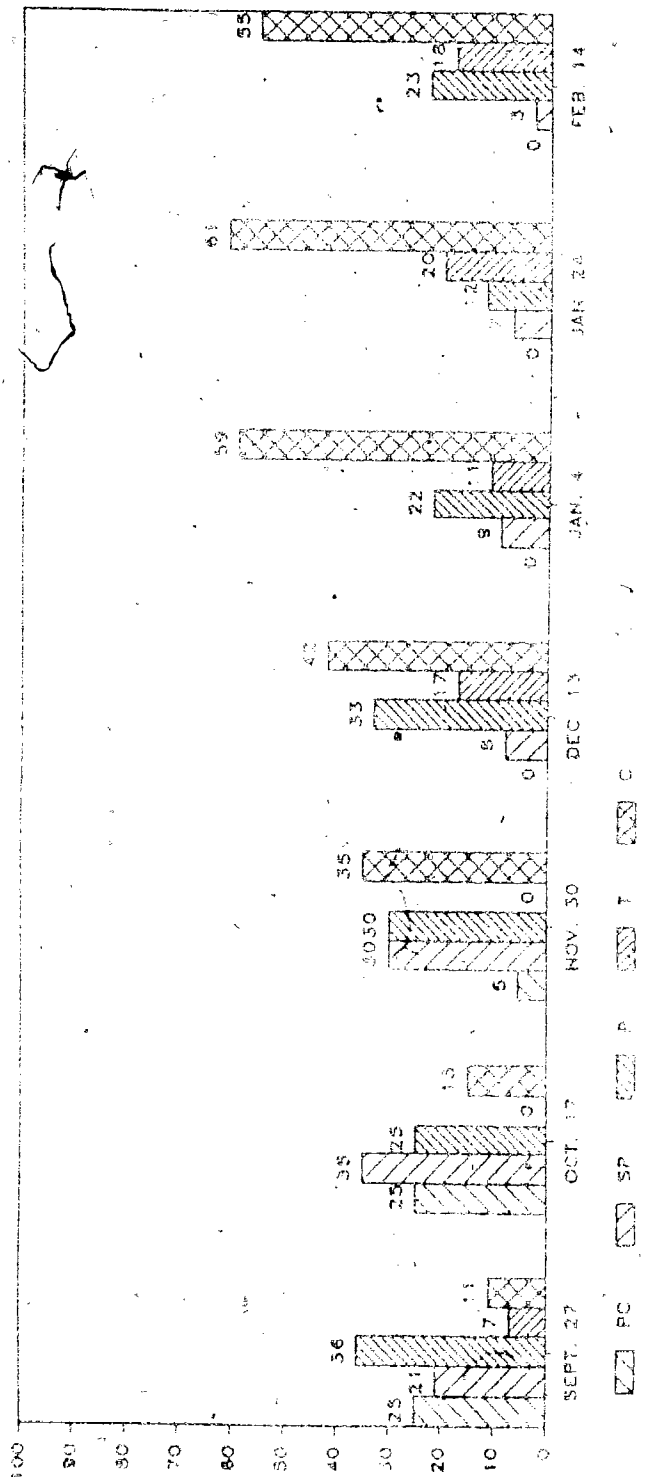


Figure 19. Histogram showing spelling strategies used for pre-consonantal

basals from the Writing Samples across schools (percentages).

Note, PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

Table 10

Summary of Spelling Strategies Used for Preconsonantal Nasals from Writing Samples and Spelling Test Across Schools (Percentages).

	October 17					November 30					January 4					February 14				
Writing Sample	25	35	25	0	15	5	30	30	0	35	0	9	22	11	59	0	3	23	18	55
Spelling Test	5	44	50	1	0	3	26	58	14	0	0	19	62	19	0	0	5	40	45	10
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

Table 11

Frequency of Use of Syllabic Sonorants from Writing Samples Across Schools.

Sept. 27	Oct. 17	Nov. 30	Dec. 13	Jan. 4	Jan. 24	Feb. 14
2 P.C.	0	0	1 P. 2 T.	1 P.	1 P.	2 P.

Note. P.C. = Precommunicative
 P. = Phonetic
 T. = Transitional

5. Ed-endings. This feature was used too infrequently in Writing Samples to give a reliable measure of the spelling strategies used (see Table 12). Although the frequency of use of this feature increased, its use was highly variable.

On the Spelling Test this feature was spelled using primarily phonetic strategies with little use of transitional or correct strategies.

Table 12

Frequency of Use of Ed-Endings from Writing Samples Across Schools

Sept. 27	Oct. 17	Nov. 30	Dec. 13	Jan. 4	Jan. 24	Feb. 14
1 P.	0	1 S.P. 6 P.	2 S.P.	4 P.	1 S.P. 3 P.	6 P.

Note. S.P. = Semiphonetic
P. = Phonetic

6. R-controlled vowels. Figure 20 summarizes the spelling strategies used for spelling r-controlled vowels from Writing Samples. In September students began by using primarily precommunicative and semiphonetic strategies with 78% of their spelling attempts being classified as such and no spelling attempts being classified as transitional or correct. After September this trend changed, with students relying more on phonetic, transitional and correct strategies, with phonetic strategies being used the most. In February 54% of spelling attempts were transitional or correct with 46% of the spelling attempts still being phonetic. Frequency of use of r-controlled vowels moved from 18 to 35 in September (see Appendix F).

Table 13 shows a summary of the spelling strategies used for spelling r-controlled vowels on the Writing Samples as compared with Spelling Test at corresponding data collection times. The spelling of r-controlled vowels

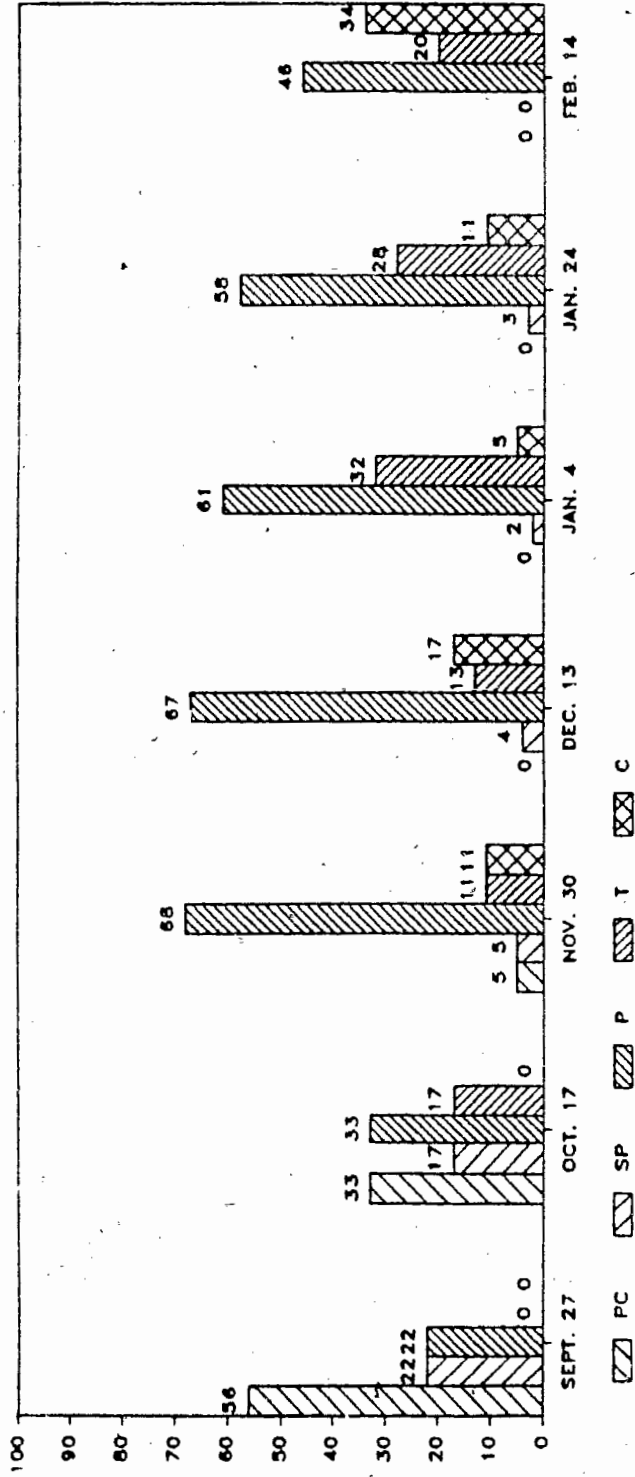


Figure 20. Histogram showing spelling strategies used for r-controlled vowels from the Writing Samples across schools (percentages).

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

on the Spelling Test and Writing Sample was quite similar. However, there were more phonetic spelling attempts from the Spelling Test in October and February than from the Writing Samples. From the Writing Samples there were more precommunicative spelling attempts in October and more correct spelling attempts in February than from the Spelling Test.

Table 13

Summary of Spelling Strategies Used for R-controlled Vowels from Writing Samples and Spelling Test Across Schools (Percentages).

	October 17					November 30					January 4					February 14				
Writing Sample	33	17	33	17	0	5	5	68	11	11	0	2	61	32	5	0	0	46	20	34
Spelling Test	8	25	52	12	4	1	13	62	23	1	1	6	64	26	3	0	1	62	18	19
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

7. Affricates. This feature was used too infrequently in Writing Samples to give a reliable measure of the spelling strategies used (see Table 14 and Appendix F). The frequency of use of affricates did not increase. This lack of use did not seem to be reflected in scores for Spelling Test (see Figure 11).

Table 14

Frequency of Use of Affricates from Writing Samples Across Schools.

Sept. 27	Oct. 17	Nov. 30	Dec. 13	Jan. 4	Jan. 24	Feb. 14
1 S.P. 1 P.	0	1 P. 1 T.	3 C.	1 T.	3 P. 2 T. 1 C.	1 P. 1 C.

Note. S.P. = Semiphonetic
 P. = Phonetic
 T. = Transitional
 C. = Correct

8. Intervocalic flap. This feature category was used too infrequently in Writing Samples to give a reliable measure of the spelling strategies used (see Table 15 and Appendix F). Frequency of use of this feature did not increase. In the Spelling Test this feature was never spelled totally correctly.

Table 15

Frequency of Use of Intervocalic Flap from Writing Samples Across Schools.

Sept. 27	Oct. 17	Nov. 30	Dec. 13	Jan. 4	Jan. 24	Feb. 14
3 PC. 1 P.	0	1 SP. 1 P.	3 P.	3 T. 3 T.	3 P. 1 T.	3 P. 1 T. 1 C.

Note. PC = Precommunicative
 P = Phonetic
 T = Transitional
 C = Correct

CHAPTER V

Discussion

Summary

The purpose of this study was to examine the spelling attempts of grade one students during the first six months of school to see what spelling strategies they used and to see if their spelling strategies exhibited a progression towards conventional spelling.

There were two methods for collecting data:

1) A Spelling Test of eighteen words with twenty-five phonetic features that were shown in previous studies to elicit particular spelling errors. The Spelling Test was administered at six week intervals.

2) Writing Samples collected from students' independent writing. The Writing Samples were collected at three week intervals.

It was hoped that a thorough understanding of the students' spelling strategies would be facilitated by collecting data from these different sources. The Spelling Test provided information about the acquisition of spelling strategies for the phonetic features being studied because the same words were used at each testing time. The Writing Samples provided a more natural setting for data collection so that the students' writing was not divorced from a meaningful context. Collecting data from these two sources also enabled comparison between the spelling strategies used for each method of data collection.

Therefore, each students' spelling could be studied over time from two methods of data collection as could each individual school. Each phonetic

feature could also be studied over time from two methods of data collection. Also, the Writing Samples could provide data for further studies of different phonetic features, the development of punctuation and the development of spacing between words.

The eight phonetic feature categories that were studied were sub-divided to make the twenty-five separate phonetic features. The spellings of the phonetic features from the Spelling Test and Writing Samples were classified according to Gentry's (1977) spelling classification system.

Results

The results of this study are consistent with previous research (Beers & Henderson, 1977; Gentry, 1979; Read, 1971, 1975; Zutell, 1979) and suggest that grade one students, in their early spelling attempts, use strategies that represent surface perceptions of the word being spelled. These spellings, termed precommunicative, semiphonetic and phonetic in this study, typically bear little resemblance to standard English orthography. As students become more familiar with English orthography they use more complex spelling strategies that rely on phonetic as well as meaning and visual clues to assist them with their spelling. These spellings, termed transitional and correct in this study, reflect the conventions of standard English orthography.

In this study, the students' spelling attempts, collected from the Spelling Test and Writing Samples, could be classified according to Gentry's (1977, 1982) classification system. Also the students' spelling attempts did exhibit a progression towards conventional spelling. Students

began by using precommunicative and semiphonetic strategies to spell. They also relied heavily on phonetic strategies. Students relied less on these strategies as time went on and more on transitional and correct strategies. These trends were evident both from the Spelling Test and Writing Samples. However, the students showed a greater reliance on phonetic strategies on the Spelling Test than on the Writing Samples, while they showed a greater reliance on correct strategies on the Writing Samples than on the Spelling Test. Perhaps, students chose to express themselves with words that they were more sure of how to spell. From the Writing Samples children wrote more as the year progressed and what they wrote they spelled more conventionally. These findings support previous studies (Beers & Henderson, 1977, Gentry, 1977, Zutell, 1979) that showed that children use identifiable spelling strategies and these spelling strategies follow a developmental progression.

General spelling trends that occurred in this study for the eight phonetic feature categories may be characterized as follows:

Tense Vowels

Beers and Henderson (1977), Gentry (1971), Read (1971, 1975), Zutell (1979), found that tense vowels are initially spelled using phonetic strategies but as children become more experienced with written language they use transitional and correct strategies. Similarly, in this study, on the Spelling Test students relied heavily on the use of phonetic strategies to spell tense vowels with the use of transitional and correct strategies becoming more prevalent as time went on. On the Writing Samples children relied more on correct strategies for spelling tense vowels than they did

on the Spelling Test but this could be because they chose words that they knew how to spell.

Lax Vowels

Gentry's (1977) study found that students spelled lax vowels correctly earlier than other features. However, early lax vowel spellings did indicate use of phonetic strategies. This was particularly true for letters whose name sounded like the word being spelled (eg. "drs" for "dress", "bl" for "bell"). This was similar to Read's (1975) study which found that children chose letters on the basis of the sound of the letter-names. This use of phonetic strategies in early testing was also shown in this study. On the Spelling Test and on the Writing Samples lax vowels were spelled correctly earlier than tense vowels, particularly lax vowels in one-syllable words.

Preconsonantal Nasals

Gentry (1977) found that it was not until after grade two that preconsonantal nasals were spelled correctly while Beers and Henderson (1977) found that preconsonantal nasals were spelled correctly at the end of grade one. Read (1975) found that students perceived the difference between words with a preconsonantal nasal and words without (eg. "link", "lick") but typically did not represent this in their spellings. In this study, students continued to use phonetic and transitional strategies even at the last testing time to spell preconsonantal nasals, although there was more use of correct strategies for this feature in the Writing Samples.

Syllabic Sonorants

Gentry (1977) found syllabic sonorants to be a difficult feature for students to spell correctly and Read (1975) found that the use of a vowel in every syllable was one aspect of standard spelling that children adopt less readily. In this study, even at the last testing, students continued to use phonetic strategies to spell syllabic sonorants. In the Writing Samples this feature was seldom used. Perhaps it was not used much due to its difficulty and conversely perhaps it was difficult because the children had little experience with it.

Ed-Endings

Gentry (1977) found that until grade two ed-endings were spelled phonetically. Read (1975) and Beers and Henderson (1977) also found that children used phonetic strategies to spell ed-endings. In this study, students primarily used phonetic strategies to spell ed-endings on the Spelling Test. This feature did not occur much in the Writing Samples. As with syllabic sonorants, this lack of use could account in part for its difficulty.

R-Controlled Vowels

Gentry (1977) found that grade two students were still using transitional strategies to spell words with this feature. Beers and Henderson (1977) reported that students used the letter "r" to spell this feature without vowels. Read (1975) discovered that 80 percent of the omissions of /ə/ in spelling were from sonorants and r-controlled vowels. In this study, r-controlled vowels were similar to syllabic sonorants as a feature that was difficult for the students to spell correctly. Even in

February, students primarily used phonetic strategies to spell r-controlled vowels both on the Spelling Test and in Writing Samples.

Affricates

Gentry (1977) discovered that grade one students spelled affricates using transitional strategies while Read (1975) found that proficient grade one readers still spelled this feature phonetically. In this study, affricates were mostly spelled using transitional strategies in February with a heavy reliance on phonetic strategies before this point. This feature was not used much in Writing Samples.

Intervocalic Flap

Gentry (1977) found that the intervocalic flap was not spelled correctly until late in grade two. Read (1975) and Beers and Henderson (1977) also reported a high reliance on phonetic strategies to spell this feature. In this study, this feature was used very little in Writing Samples and was never spelled completely correctly on the Spelling Test.

Phonetic features that were not used much in the Writing Samples generally were not spelled correctly on the Spelling Test. This is similar to the findings of Beers, Henderson and Grant (1977) in which more children spelled high frequency words correctly than low frequency words and supports the logical conclusion that experience with a word is important for correct spelling.

Conclusions

The results of this study support the theory that learning to spell, like learning to speak, is an active process whereby children discover the

rules that govern language. In learning to spell, children construct hypotheses about orthography, compare their productions to the standard spelling to which they are exposed, and reconstruct their hypotheses until their spelling attempts match the standard spelling. Young children's spelling errors are not merely bad habits, any more than a baby saying "Ma-ma" for "Mommy" is a bad habit. Rather, errors are indicators of the hypotheses about orthography that the young child is making. These errors are judgements based on the children's limited knowledge of orthography and are a natural occurrence when children are progressively learning about standard spelling.

Limitations of the Study and

Recommendations for Further Research

This study is limited to written productions of the students from the three classes and the twenty-five phonetic features being studied.

In this study the data collections were done by different people. The Kindergarten Pretest was administered to all three classes by a substitute teacher. The first two grade one data collections were administered by a different teacher-aide for each school. The remaining grade one data collections were administered by the classroom teacher for each class. Although careful guidelines were given, some slight differences in administration were possible.

The scoring of the Spelling Tests and Writing Samples was done by the researcher. Although there were careful guidelines for following the classification system, some errors could have been made.

Further studies with larger samples with more rigorous sampling, testing and scoring procedures are warranted. Also, other phonetic features such as plurals, digraphs such as "th", "sh", "ch" and "wh", the other r-controlled vowels of /ər/ like in "bird" and /or/ as in "pork" could be studied. The relationship of the development of spacing between words in independent writing and the development of correct spelling strategies would also be an interesting further study.

Implications

The implications of this study for educators are summarized as follows:

- 1) Learning to spell, like learning to speak, is a language-based activity that requires the active participation of the learner. It has its foundation in the natural language abilities that the children already possess when they come to school. Rather than teaching spelling as a process of memorization or waiting until children have mastered a hierarchy of sub-skills, students should be allowed and encouraged to write early in their schooling. Children's approximations to standard orthography should be respected as their interpretation of written language. An active approach to spelling could foster sharing of spellings between children while conventional spelling could still be modelled.

- 2) Young children should be encouraged to write independently and to invent their own spelling patterns. Children's own stories, books, messages, letters, poems, should be at the heart of the writing/spelling program. Children should be given time, space and encouragement so they can devote themselves to these activities.

3) Teachers should become familiar with children's spelling errors and use this information to help expand children's knowledge of orthography.

Children's misspellings are indicators of the hypotheses about orthography that the children are making. Writing Samples collected from the students work could be collected and provide interesting information about their progress. Teachers could also use misspellings as guidelines for teaching. For example, if a word was spelled purely phonetically, a teacher could design activities to show how words can sound the same and be spelled differently (e.g., one and won) and that some words require visual information to be spelled correctly (e.g., their and there).

4) Teachers could become familiar with information about which phonetic features are developmentally easier or more difficult for children to spell. Therefore, teachers could monitor each child's progress in learning to spell. With this knowledge teachers could be more aware of each child's stage of learning and know what to introduce a child to next.

Appendix A

Phonetic Features and Grade One Spelling Test Words

Phonetic Feature		Spelling Test Words
1. Tense vowel	/e/ /i/ /u/ /o/ /u/	trade eagle bike road tube
2. Diphthong	/aɪ/ /ɪj/ /iɪ/ /əj/ /ɔj/	map, dragon get, dressing tip, limped hot, monster run, dusted
3. Preconsonantal nasal	/n/ /m/ /ŋ/	monster limped dressing
4. Syllabic sonorant	/ər/ /əv/ /əl/	dragon bottom eagle
5. ed-ending	/t/ /d/ /ɪd/	limped purred dusted
6. r-controlled vowels	/ər/ /ɛr/ /ar/	purred monster car
7. Affricate	/dr/ /tr/	dragon, dressing trade
8. Intervocalic flap	/d/	bottom

Note: Phonetic Symbols are used according to guide in
Fronkin, V. & Rodman R. An introduction to language (2nd ed.)
New York: Holt, Rinehart and Winston, 1978.

Appendix B

Questionnaire

1. What reading program do you use? _____
2. Do you use a supplementary program? _____
3. If so what do you use? _____
4. Other comments to describe your reading program. _____

5. Do you teach spelling? _____ If so at what time do you introduce it
 and how do you teach it? _____
 Time _____
 Method (weekly spelling lists, intergrated with other language arts,
 etc.) _____

6. Do your children write independently? _____
 If so when do you have them start? _____
 How do you introduce written expression? _____
 (Class experience stories, transcribing childrens' message and having
 them copy, having children write freely, use of word lists etc.)

7. Do your children use journals/diaries? _____
 If so when did they start to use them? _____
 How often do the children write in them? _____

8. Do your children use individual dictionaries? _____

If so describe them and their use. _____

9. Do you correct your childrens spelling errors, have them recopy or accept their errors? Explain. _____

10 How often do you have your children write?

(How many minutes per week aproximately?)

Oct. - Dec. _____

Jan. - March _____

11 Any other comments to further describe your writing/spelling/reading program. _____

Appendix C

Kindergarten Pretest Words and SentencesWordSentence

1. tap

Turn the tap on.

2. read

I will read this book.

3. drip

The tap will drip.

4. ripe

That apple is ripe.

5. pet

My dog is a pet.

6. tape

I will use tape to make this
wrapping paper stick.

7. patter

The rain went pitter patter on
the roof.

Appendix D

Grade One Test Words and Sentences.

<u>Word</u>	<u>Sentence</u>
1. map	A map is a handy thing to have in a strange city.
2. lip	I got hit on the lip with a ball.
3. hot	My soup is hot.
4. run	When I'm outside I like to run.
5. trade	I will trade my hockey cards for your stickers.
6. eagle	An eagle is a large bird.
7. bike	My friend will ride his bike.
8. road	Remember not to play on the road.
9. tube	There is no more toothpaste in this tube.
10. dressing	When you're dressing for school remember to put on a clean pair of socks.
11. limped	My dog limped down the road because his foot was sore.
12. monster	I painted a picture of a big green monster.
13. dragon	A dragon can breath fire.

14. bottom

I had to look right down to
the bottom of the box to find
my gift.

15. purred

The cat purred as the boy
petted her.

16. dusted

The kind woman dusted the
table.

17. car

My car is red.

18. get

What did you get for your
birthday?

Appendix E

Sample of a Spelling Test for One Student.

map

lip

shot

ran

ran

light

birds

bird

top

desert

limp

mostr

ingen

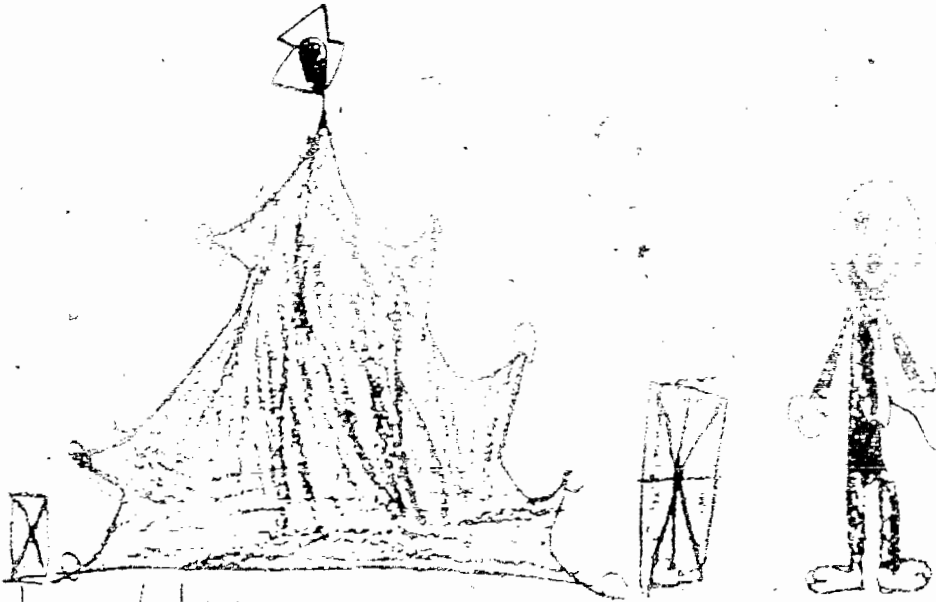
trum

scri

drad

and

get

Sample of a Writing Sample for One Student.

I like to gain my
 presis. I like to
 play with my toys.
 I like to go to my
 grandparents on Christmas
 day. I like to have
 a snow ball fight.

Appendix F

Frequency Scores for Spelling Strategies Used from Spelling Test Across Schools.

	October 17	November 30	January 4	February 14
School # 1 ^a	16 115 123 36 19 16 41 156 70 27 4 36 163 75 32 1 6 136 100 67			
School # 2	15 54 128 35 16 1 27 121 75 24 3 19 123 73 30 0 9 75 97 67			
School # 3 ^b	38 53 104 31 20 0 7 122 74 45 0 8 90 98 52 0 1 43 83 121			
Total	69 222 355 102 55 17 75 399 219 96 7 63 376 246 114 1 16 254 280 255			
	PC SP P T C PC SP P T C PC SP P T C PC SP P T C			

Note. PC = Precommunicative

SP = Semiphonetic

P = Phonetic

T = Transitional

C = Correct

^aOne Student left out the word "road" so no score was given for the feature tense /o/.

^bOne Student left out the word "purred" so no score was given for the feature r-controlled vowel /er/ and the feature ed-ending /d/.

M

Frequency Scores for Spelling Strategies Used for the Phonetic Features Studied
from Spelling Test Across Schools.

	October 17					November 30					January 4					February 14				
Tense Vowels ^a	7	26	95	1	0	1	7	106	11	5	1	3	105	13	8	1	0	42	41	46
Lax Vowels	22	73	71	42	52	6	21	61	82	90	1	15	51	95	98	0	1	33	85	141
Preconsonantal Nasals	4	34	39	1	0	2	20	45	11	0	0	15	48	15	0	0	4	31	35	8
Syllabic Sonorants	9	21	38	10	0	2	6	45	25	0	1	8	34	33	2	0	2	27	41	8
Ed-endings ^b	10	35	30	2	0	2	6	70	0	0	1	13	63	0	1	0	4	64	3	7
R-controlled Vowels ^c	6	19	40	9	3	1	10	48	18	1	1	5	50	20	2	0	1	48	14	15
Affricates	9	8	41	20	0	2	4	23	49	0	2	1	24	48	3	0	3	9	36	30
Intervocalic Flap	2	6	1	17	0	1	1	1	23	0	0	3	1	22	0	0	1	0	25	0
Total (All Features)	69	222	355	102	55	17	75	399	219	96	7	63	376	246	114	1	16	254	290	255
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

^aOne student left out the word "road" so no score was given for the feature tense /o/.

^bOne student left out the word "purred" so no score was given for that student for ed-ending /d/.

^cOne student left out the word "purred" so no score was given for that student for r-controlled vowel /er/.

Frequency Scores for Spelling Strategies Used from Writing Samples Across Schools.

School	September 27					October 17					November 30					December 13					January 4					January 24					February 14											
# 1	14	29	11	10	10 ^a	7	20	14	3	10	9	10	20	16	30	5	11	29	8	42	0	17	34	26	35	0	12	31	38	61	0	9	70	33	112	(74)	(59)	(85)	(95)	(112)	(142)	(224)
# 2	50	17	21	9	12	9	5	12	3	15	0	5	11	8	31	0	1	19	22	49	0	4	19	9	45	0	1	6	9	63	0	0	12	14	148	(109)	(44)	(55)	(91)	(76)	(79)	(174)
# 3	0	4	15	2	17	0	7	6	5	13	0	2	27	17	34	0	7	69	46	123	0	3	62	47	186	0	0	34	71	169	(39)	(31)	(80)	(245)	(298)	(376)	(274)					
Total	50	48	21	39	16	32	32	16	38	9	17	58	41	95	5	19	117	76	214	0	24	114	82	266	0	19	111	100	367	(222)	(134)	(220)	(431)	(386)	(597)	(572)						
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C							

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

^a Numbers in parentheses indicate total number of occurrences of the phonetic features being studied from Writing Samples.

Frequency Scores for Spelling Strategies Used for the Phonetic Features
Studied from Writing Samples Across Schools.

	September 27					October 27					November 30					December 13					January 4					January 24					February 14				
Tense vowels	13	15	10	6	18	5	7	12	3	19	2	3	16	11	47	1	3	32	14	0	6	44	17	74	0	3	45	23	142	7	0	38	33	119	
	(62)					(45)					(79)					(141)					(213)					(220)									
Less vowels	29	24	21	13	18	4	17	13	1	16	3	5	15	27	39	4	3	43	17	85	1	13	27	43	163	0	10	28	52	184	0	6	27	39	222
	(125)					(62)					(91)					(187)					(216)					(304)									
Preconsonantal nasals	7	6	10	2	3	5	7	5	3	7	1	6	6	0	7	0	3	22	11	24	0	4	10	5	27	0	4	7	12	26	0	3	23	19	54
	(29)					(27)					(20)					(66)					(46)					(59)									
Syllabic sonorants	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0
	(2)					(0)					(0)					(0)					(1)					(2)									
EW-endings	0	0	1	0	0	0	0	0	0	0	0	1	5	0	0	2	1	3	0	1	3	4	0	0	1	1	0	0	0	2	0	5	0	0	
	(1)					(0)					(8)					(2)					(4)					(6)									
U-controlled vowels	10	4	4	0	0	2	1	1	1	0	1	13	2	2	2	1	1	11	1	1	1	25	13	1	0	21	0	4	0	0	1	16	7	12	
	(18)					(5)					(19)					(24)					(41)					(56)									
Affricates	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	1
	(2)					(0)					(2)					(0)					(1)					(2)									
Intervocalic flap	3	0	1	0	0	0	0	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	3	3	0	0	0	0	1	0	0	0	3	1	1
	(4)					(0)					(2)					(3)					(6)					(4)									
Total	54	50	48	21	39	15	32	32	16	39	7	17	58	41	95	5	19	117	76	214	1	24	114	32	166	7	19	111	100	367	3	9	116	118	429
(All features)	(222)					(174)					(270)					(421)					(486)					(597)					(672)				
	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C	PC	SP	P	T	C

Note. PC = Precommunicative
 SP = Semiphonetic
 P = Phonetic
 T = Transitional
 C = Correct

Phonetic features with less than 8 occurrences at one data collection were used too infrequently to give a reliable measure of the spelling strategies used.

^a Numbers in parentheses indicate total number of occurrences of the phonetic features being studied from Writing Samples.

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