Does an Established Model of Orthographic Development Hold True for English Learners?

Lori A. Helman
University of Minnesota

Donald R. Bear
University of Nevada, Reno

Students' spellings have often been described as windows to their understanding of what they know about words, their orthographic knowledge (Henderson, 1990). The study of the spellings of English learners is an opportunity to look through a window into their orthographic knowledge and explore how development is shaped by students' knowledge of other languages. In 1971, Charles Read amazed the field of literacy research by showing how the developmental spelling of preschool children reflected their growing knowledge of the English writing system. Read described how students' spelling strategies could be explained linguistically by the actual similarities between the target letter and misspellings in the way they are articulated in the mouth (Read, 1971). A classic example is the relatively common misspelling of *drive* as JRF in which children substitute letter-sounds that are similar in articulation, choosing the easier and more familiar sounds to pronounce, /jr/ for the harder to pronounce /dr/, and the more common /f/ for the /v/ sound.

Parallel to Read's study, Henderson and his colleagues noticed that spelling errors revealed something about students' orthographic knowledge and development (Henderson & Beers, 1980; Henderson, Estes, & Stonecash, 1972). Henderson's research would in turn come to guide that of his students, who constructed a rich body of data describing the orthographic development of English-speaking students as they mature (cf., Bear & Templeton, 2000; Bear, Invernizzi, Templeton, & Johnston, 2004; Ganske, 1999; Invernizzi & Hayes, 2004; Templeton & Morris, 2000). This line of research documents developmental milestones, describes features typically mastered at each stage, and considers at what grade levels each stage is most prominent.

The current paper asks the question, "Does an established model of orthographic development hold true for English learners?" Given that more than 5 million students in U. S. schools live in homes where a language other than English is spoken (Padolsky, 2005), it is critical to understand how the instructional models being used in literacy development fit or require adaptation for linguistically diverse students. In this paper we explore what we have learned about the literacy development of English learners from analyzing their developmental spelling inventories in conjunction with other literacy assessments.

ORTHOGRAPHIC DEVELOPMENT IN ENGLISH

It is important to understand the model of orthographic knowledge that has been established with monolingual students before discussing its application with English learners. In our theoretical framework, we describe the developmental stage model of spelling from the perspective of student learning, as well as how it is assessed. Next, we share some of the key points about spelling development with English learners from the research literature.

A Model of Orthographic Development

All orthographies may be viewed as having three levels of complexity—the sound-symbol or alphabet layer, the pattern layer, and the meaning layer (Bear, Templeton, Helman, & Baren, 2003). Student development is presented within the context of these three layers.

The alphabet layer. The first two developmental stages lie within the alphabet layer of English. In the *emergent* stage, students begin to grasp simple phonological discrimination skills at the same time that they learn the letter names of the alphabet. Emergent writers learn how to form their letters, how to write words like their names, and they begin to learn some easy letter-sound correspondences. Their word and phonics learning is a dynamic interchange between learning about words, letters and sounds, and making generalizations about them from the words that they see in text (Morris, Bloodgood, Lomax, & Perney, 2003). As they acquire concept of word in print, students are able to hold the word stable, track their way through familiar text, and use their knowledge of beginning sounds and language to identify words as they read. In spelling, emergent students encode predominantly the first and other prominent sounds. Sample spellings of emergent monolingual students show that they represent consonants more than they do vowels, for example, spelling *elephant* as LFT or *elevator* as L at the beginning (Read, 1975).

Students in the next stage, the *letter name-alphabetic stage* continue to learn about the consonants in English, and they begin to experiment with the spelling of vowels, particularly the short vowels. Students use letter names to assist them in spelling; for example, the word *when* may be spelled YN because the letter name "y" is close to the sound of /w/. Long vowels are easy to spell at this stage because the letter names are such clear signals: a letter name speller's use of TIM for *time* is straightforward. The spelling of the short vowels is less direct. Using the way the sounds are made and comparing information about articulation to the long vowel names, students choose the name of the vowel that *feels* closest in terms of articulation to the short vowel; e.g., *ship* would be spelled SHEP because the sound of the short **i** feels closest to the letter name for **e**. During the letter name-alphabetic stage, students make headway learning the beginning and final consonant blends and digraphs. And by the end of this stage students are quite familiar with how to spell most short vowel words (Ehri, 2005).

The pattern layer. In the *within word pattern stage*, students experiment with long vowel patterns, the CVCe, CVVC, CVV spelling patterns in English such as in the words *bate, bail* and *bee*. Within word pattern spellers learn the spelling patterns of single-syllable words, and as they master complex consonant blends and digraphs they learn how to spell the less frequent short and long vowel patterns; for example, *caught, threat, ridge, weight*. The long vowel patterns are more abstract than CVC-pattern words, and learning long vowels may require more complex cognitive processing than the short vowel pattern (Bear, 1992; Invernizzi, 1992). As students learn more about long vowel patterns they also master the spelling of digraphs and blends. At the end of this stage, with what we expect is a sufficient sight vocabulary, within word pattern students learn how to spell homophone pairs accurately (e.g., *plane/plain* and *reel/real).*

The meaning layer. Upper level word study involves learning how polysyllabic words are structured in English, and includes two developmental levels: the *syllables and affixes stage* and the *derivational relations stage*. Students who experiment with how to combine two-syllable words and common affixes (*un, re*) are described as being in the *syllables and affixes stage* of spelling

(Henderson, 1981). Students begin to see patterns in words and come to automatically separate polysyllabic words into meaning units. At this point, learners master inflectional morphology and the way easy word endings are spelled (*crying, cries*). Students also master syllabication of words using their knowledge of base words (*mistaken, unfortunate*), and according to familiar stress and syllable patterns (e.g., *hu / man*, *hu / man / i / ty* are easy words for them to syllabicate by the end of this stage).

Later in development, and deeper into the meaning layer, students make morphological connections, such as across the words *port, transport, and transportation.* This final stage is the *derivational relations stage* in which students expand their vocabularies with more academic and content-specific vocabulary words (Templeton, 2003). Their knowledge of derivational morphology advances as they learn more word roots and stems and learn to spell more advanced, less frequent affixes (e.g., *pur-, ad-, -ent, -ious*) (Templeton, 1989).

Assessment of Stage of Orthographic Development

One task that is used to assess monolingual students' orthographic development is a developmental spelling analysis in which student writing is examined for the orthographic knowledge that it represents. For example, a student who writes HOP for *hope* is phonemically segmenting the word and spelling by sound; a student who puts RAEN for *rain* understands that long vowels must be marked in English; and a student who encodes FORTUNATE for *fortunate* understands that meaning takes precedence over sound in the orthography of English.

Developmental spelling inventories have become useful tools for teachers by providing lists of progressively more difficult words with which teachers can easily collect assessment information from their students (Bear, et al., 2004; Ganske, 1999). The scores on these inventories have been related to other spelling measures across a wide range of learners (Invernizzi & Hayes, 2004). Developmental spelling inventories have also been related to other measures including word recognition, reading rate, writing, and standardized reading test scores, including subtests of comprehension (Bear, 1992; Edwards, 2003; Templeton & Morris, 2000).

Orthographic Development for English Learners

The English spelling strategies of bilingual students have not been studied to the same degree as monolinguals. In fact, a recent review of the literature by the National Literacy Panel on Language-Minority Children and Youth found only eight research studies that focused on spelling with second-language learners (Dressler & Kamil, 2006). Of the eight studies, six featured native speakers of Spanish, who comprise the great majority of English learners in the U. S. The report underscores the important relationship among the phonology of students' home languages, and students' speaking and spelling in English. The cross-linguistic relationship may result in transfer or interference across languages, depending on the relative similarities or differences between first and second language (Bialystok & Mc-Bride-Chang, 2005).

Students bring what they know about sounds and spelling from their home language to the task of learning English. Several studies have found that English learners have greater difficulty spelling words that contain contrasts that are difficult to distinguish in their home language (Cronnell, 1985; Dressler, 2002; Fashola, Drum, Mayer, & Kang, 1996; Helman, 2005; Tolchinsky & Teberosky, 1998; Zutell & Allen, 1988). Dressler found that cross-linguistic factors exerted

positive and negative influences on Spanish speakers' spelling performance: problematic phonemes accounted for predictable spelling errors; homophones were more frequently substituted for target words, such as in the spelling of COT for *caught*; and the positive transfer of cognate spellings was related to students' literacy in Spanish, as well as the level of spelling complexity of the target word (Dressler, 2002).

In the recent past, we are seeing more analysis of spelling data from the growing population of students who learn English as a new language at school (Bear, Helman, Templeton, Invernizzi & Johnston, 2007; Helman, 2005; Howard, Arteagoitia, Louguit, Malabonga, & Kenyon, 2006; Tolchinsky & Teberosky, 1998). A question that arises in this literature is, do students who are learning English demonstrate the same developmental patterns in their spellings as do monolingual-English speakers? While a beginning research base exists, there is much we need to understand about how students' home languages interact with their literacy experiences in English to promote orthographic development.

The current study builds on previous spelling and early literacy assessment research, and adds data we have collected across several studies in the previous five years. We inquire into the patterns of orthographic development for English learners, share four case studies to illuminate our points, and discuss implications for classroom practice.

METHOD

The current paper draws data from developmental spelling inventories and other early literacy assessments that were collected with English learners from a variety of language backgrounds between 2001 and 2006 in a Midwestern and western state. Data were collected as part of several studies including a statewide Reading Excellence Act project that involved 52 schools working to improve their literacy achievement, grade level research projects within individual school sites, and from students participating in tutoring at a university clinic.

Participants

Participants in the current study were 4085 English-learning students from first grade through adult learners in the following groups: 1) The first group of students consisted of 3945 first through third-grade students who were part of a statewide literacy initiative to improve reading achievement at the primary grades in a western state of the U.S. All students attended schools that were performing below state expectations. Spanish-speaking students who were not receiving special education services were identified from the statewide data set for inclusion in our analyses. Of this large group, two representative school sites were identified for more in-depth analyses of students' spelling inventories. The spelling samples of 100 first through third graders at these two school sites are thus considered a "subgroup" of the larger statewide sample. 2) A second group of participants consisted of students attending one of three elementary schools in a large urban area in the Midwest. Students were in grades 1 through 6, their schools had high percentages of students on free or reduced lunch, and the number of English learners ranged from 46 to 64% of the total school population. 3) The final group of participants included English learners ranging in age from six years old to adult who attended a university reading clinic supervised by the second author.

The clinic provided an opportunity to work with students and analyze their developmental literacy assessments over a semester of work.

Participants in the current study were primarily from Spanish-speaking homes, although more than a hundred came from Somali or Hmong-speaking homes, and a handful of students spoke other languages in the home such as Chinese or Russian. While demographic data for each individual participant are not known, more than 90% of participants attended elementary schools with predominantly low-income students and were classified as Title I.

Measures

The primary measure of orthographic development used in the current study was the developmental spelling inventory, three examples of which are described below. In many, but not all cases, additional language and literacy assessment data were available for study participants. These data included Informal Reading Inventories, phonological awareness assessments, and language proficiency screenings.

Developmental spelling inventories. Spelling inventories used in the current study assess students' ability to spell a series of words of increasing orthographic difficulty, and responses were awarded points for the accurate representation of a variety of phonic features. Features that were evaluated in the spelling inventories included initial and final consonants, digraphs, short vowels, consonant blends, long vowels, ambiguous vowels, inflected endings, syllable junctures, affixes, and roots and derivatives. Students in different grade levels were given the spelling inventory most appropriate to their developmental range. In the current study each student was administered one of the following developmental spelling inventories:

1. Primary Spelling Inventory (Bear, et al., 2004): This inventory contains 26 words (easiest= fan, hardest= riding) which cover orthographic features through inflected endings, and is usually given to students in the primary grades.

2. Elementary Spelling Inventory-1 (Bear, et al., 2004): This inventory contains 25 words (easiest= bed, hardest= opposition) covering features across the stages. This assessment is typically given to students in second grade and up.

3. Phonological Awareness Literacy Screening (PALS) Spelling Inventory (Invernizzi & Meier, 2001). This inventory contains 28 words and is used with first through third graders.

Informal Reading Inventories and phonological awareness assessments. Many of the students in the current study also participated in assessments that measured their phonological awareness, word recognition in isolation, and accuracy, fluency and comprehension in the reading of graded text passages. The primary instrument used for this assessment was the PALS 1-3 (Invernizzi & Meier, 2001).

Language proficiency assessment. Data on language proficiency were available for many of the students evaluated in the current study. The primary instrument used to measure language proficiency was the Language Assessment Scales-Oral (LAS-O) (De Avila & Duncan, 1994).

Data Analysis

Analysis of data involved both quantitative and qualitative methods. Descriptive statistics were performed to show the relationship among spelling performance, word and passage reading, and

language proficiency for two groups of participants: the 3945 English learners in the statewide first through third grade project, and 54 second-grade students who were in the Midwest sample. Means, standard deviations, and correlations were identified for these groups in relation to grade level and English proficiency level. These analyses provided a "big picture" of average student performance across the grade levels so that qualitative examples could be situated as typical or atypical.

While statistical analyses provided some structure for understanding general aspects of English learners' development, the heart of our analyses was the qualitative review of developmental spelling inventories. We evaluated hard copies of developmental spelling inventories from English learners in the statewide reading initiative (100 total), the Midwest projects (120 total), and the reading clinic (20 total). After completing a spelling inventory, each student's writing was scored according to the number of orthographic features that were correctly used. A spelling stage was identified for each student. Next, writing attempts from the student's spelling inventory were reviewed to see if patterns were evident in the miscues. Errors that seemed unusual, based on the research literature with native English speakers, were noted. Using one subset of the 100 samples from the statewide reading initiative, 19 spelling inventories from English learners were match-paired to 19 native English speakers in the same schools based on developmental spelling score and grade level. These assessments were then compared for variations in the types of spelling miscues that were present (Helman, 2005).

For many of the students who participated in the current study, we were able to construct portfolios of their orthographic development by spotlighting their spelling assessment alongside other literacy assessments including measures of fluency, accuracy and comprehension in connected reading, or word recognition in isolation. In order to share what we learned through our quantitative and qualitative analyses, we selected four example students who represented development across the age and grade level spectrum: first grade, second grade, fourth grade and adult learner. We found cases that illustrated developmental behaviors that fit within the range of typical achievement for English learners for our data set. Because the vast majority of our participants were Spanish speakers and the next-largest group spoke Hmong, we chose to present three Spanish-speaking and one Hmong-speaking case.

RESULTS

We share results first from the statewide data set, and then use the four case studies to illustrate qualitative aspects of typical assessment results.

Results from Group Statistical Analyses

Our analysis of student performance data from the statewide first through third grade project included 3945 English learners from Spanish-speaking backgrounds. Of this group, 27% were first graders, 27% second graders, and 46% were third graders. Our data consistently showed a lag in performance for English learners in the areas of sight word recognition, instructional reading level, and features correct on their spelling inventories. English learners were identified as not meeting grade-level expectations at rates more than double those for native English speakers. When students were categorized into literacy levels by the sum of their assessment scores, 27.9% of English learners would still be classified as beginning readers/alphabetic spellers in the spring of their third grade

year. The mean Spanish-speaking student had an instructional reading level approximately one year behind grade level. For example, the mean score for first grade Spanish speakers was at the primer level, for second graders, the first grade level, and for third graders, the second grade level (Helman, 2005). Table 1 displays the differences in the spelling feature scores that were evident between English learners and native English speakers, and describes the features that proved more difficult for Spanish-speaking students.

Table 1. Differences in spelling results between monolingual-English and Spanish-speaking students

Grade level	Difference in average points between ME and SS student	Areas of greatest average point differences between ME and SS students
Grade 1	-10.9	Digraphs, blends and CVCe pattern
Grade 2	-10.4	CVCe pattern and long vowels
Grade 3	-11.6	CVCe pattern, long vowels & r- and l-controlled

Another important result from the descriptive statistics of the statewide literacy data was that students with higher oral English scores systematically outperformed their same-grade peers on word recognition, developmental spelling and oral reading in context (Helman, 2005).

Illustrative Cases of Spelling Development

We selected four cases to share as exemplars of the results we encountered in our qualitative evaluations of developmental spelling assessments. Our examples are students who represent performance levels that were typical based on the descriptive statistics of our large data set. All case study names are pseudonyms.

David. David was a Spanish-speaking student assessed in March of his first grade year. David was classified as a "Limited English Speaker" on the LAS-O that he was given. David was able to produce eight short sentences in his retelling of a story for this assessment, including the following: "He see a big eyes. 'Lina sleep. And 'Gelina listen to her mommy sing…"

David was able to read a story at the level of Preprimer A. The simple story used repetition, prediction, and simple sight word vocabulary. David was tripped up in his performance of the 35-word passage because the repeated phrase "Tom does not" was missread in a variety of ways. His emerging vocabulary and syntax in English clearly had an effect on his performance, which was considered "below benchmark" by state and national standards.

Results from David's spelling inventory placed him at the beginning of the letter name-alphabetic stage. He correctly encoded all of the beginning and final consonant sounds that were assessed. He was able to write the word *dig,* but in the other six words he either omitted or substituted different letters for the short vowel sounds. For example, David spelled *fan* as FIN, *rob* as RHB, *gum* as GWM and *stick* as SDK. The assessment was discontinued after ten words.

Bao. Bao was a Hmong-speaking student in the spring of second grade at the time of her assessment. She was categorized as a "Limited English Speaker" based on her LAS-O screening. Bao's retelling of a simple story was composed of three long sentences, including the following: "One day, the uncle call to them and then one night he come over, and then the girl was shy…"

Bao read at the instructional level on a first grade passage. The majority of her miscues changed the meaning of the passage, such as in her substitutions of "drink" for *dark*, "water" for *dark,* and "pit" for *pets.* Although she read the passage at a fluent pace with some phrasing, she missed 3/6 of the comprehension questions that were asked. As a second grader, Bao is approximately one year below the expected reading proficiency for students in her district.

Figure 1. Bao's spelling inventory

Figure 1 shows Bao's efforts on her spelling inventory. She represented the salient beginning, middle and ending sound of each word with a letter-name spelling attempt. For example, she correctly spells *fan, dig, rob* and *gum.* She spells *pet* as PAT, *wait* as WAT, and *shine* as SIN. Bao is

beginning to represent consonant blends in her writing such as in her encoding of STIK for *stick,* or SLD for *sled.* In most cases where a blend is called for, however, Bao writes a single letter such as in her representation of *blade* as LAD. Consonant digraphs are also incomplete in 6/7 cases, as in her representation of *chewing* as GOWN. She was identified at the middle letter name-alphabetic stage.

Reyna. A Spanish-speaking student, Reyna was in the spring of her fourth grade year at the time she was assessed. Reyna's LAS-O score identified her as a "Limited English Speaker," speaking in some phrases with a small English vocabulary. Reyna's retelling of a simple English story was composed of nine connected phrases including the following: "An' his uncle come to her home, to her home house, an then um Angelina has six years old…"

Based on a 95% accuracy rate, Reyna's instructional reading level was the third grade level. Errors included several omissions of content words that could have disrupted meaning on the informational selection, such as "snacks" for *snakes,* and "willed" for *wild*. Reyna was able to correctly answer just two of six comprehension questions on the passage. Her reading rate was 111 words per minute. Her reading was rapid, and several terminal, end-of-sentence junctures were ignored. The reading could be described as expressive in phrasing, generally, but there was little word emphasis for expression, or change in voice, pitch or intonation on meaningful phrases in the passage to relay focused comprehension. Given Reyna's limited comprehension of the third grade passage, her instructional reading level could be considered second grade level.

Reyna spelled 5 of 13 words correctly on her qualitative spelling inventory. She correctly spelled all of the beginning and final consonants, beginning consonant blends and four of the seven short vowel words. Some final sounds were not represented accurately: COTH for *coach,* and DRING for *dream*. She did not represent the long vowel patterns in several words. She spelled *wait* correctly, and spelled *blade* as BLAD, *dream* as DRING, and *coach* as COTH. It was determined that Reyna was a middle letter name-alphabetic stage speller who would benefit from studying short vowel patterns and consonant digraphs and blends.

Margaret. Margaret was an adult learner who had been born in El Salvador and came to the United States at the age of eleven. At fifteen, she married an El Salvadoran emigrant from whom she learned "a lot of English." Margaret had two grown children and a daughter in third grade, and owned a childcare facility with 11 people in her employ. She came for help to a university reading clinic, saying that she wanted to write clearer notes to her husband, pronounce some words in a more standard fashion, and write her life story. Margaret said that she wanted to go back to basics, to "start at the beginning."

Margaret's word recognition was flawless through the seventh grade word list. At the seventh grade list, Margaret misread less common words. Minor mispronunciations were made that were influenced by her knowledge of spoken and written English. She pronounced the **i** as a long "ee," *ch* as "sh," and interchanged /b/ and /v/. Similar mispronunciations were a part of her everyday speech ("*Levis* is hard to say.") Occasionally, she over-pronounced the endings of words, such as, "pollutah" for *pollute*.

Orally, Margaret read a 100-word, fifth grade story with 94% accuracy and a rate of 109 words per minute. Margaret's six reading errors may be considered minor, relaying her knowledge

of English syntax, and inflectional morphology: *called* was read as "calling," *ease* as "easy," *completed* as "completely."

Figure 2 shows one of Margaret's spelling assessments while attending the tutoring clinic. A stage assessment placed her in the late letter name-alphabetic stage of spelling. Margaret appeared to know how to spell many single syllable words, including high frequency words such as *when, drive,* and *carries.* It was clear, however, that there were some consonant and vowel patterns that she had not learned to spell. She had difficulty spelling very easy words like *bed* (BEB, BEAT). Many of her errors were related to the sound patterns of Spanish as when she spelled *shopping* as CHOPING and *chewed* as SHOOE. There were a number of unfamiliar final sounds in English that made it difficult for her to spell words that ended with a *d* or *t.*

Figure 2. Margaret's spelling inventory

Spelling Assessment Day 2		
Word	Attempt	Additional attempts
bed	BEB	BEBT BEAT
ship	correct	
when	correct	
lump	correct	
float	FLOTE	
train	TREIN	REIN
place	PLEACE	
drive	correct	
bright	BRITS	
shopping	CHAPING	
spoil	correct	
serving	correct	
chewed	SHOOE	SHU CHOOW
carries	correct	
marched	MAR	
	7/15	

DISCUSSION AND IMPLICATIONS FOR INSTRUCTION

In our discussion, we first share six patterns of development for English learners that emerged from analyses of the data. These patterns are then highlighted in the four case studies.

Six Patterns in the Developmental Spelling of English Learners

Analyses of students' spelling samples revealed the following patterns:

1. Misspellings reflected minimal contrasts between the home language and English. For example, Spanish speakers made substitutions between difficult contrasts such as /ch/ and /sh/.

2. English learners were more likely to substitute whole words than monolingual English students. This may be because students do not know the word they are trying to spell and substitute a word they know with a similar sound and/or function. Some English learners have a relatively small set of known words, and they may not recognize the final sound of unstressed syllables (e.g., WHILE for *when*, BORDER for *broadcast*).

3. English learners often do more sounding out. English learners use their knowledge of consonants and vowels in their primary language to spell and analyze words. This is evident in the reading and spelling of students who are 1) accustomed to a transparent writing system, one in which the letters make the same sound in all words, or 2) a language with an open syllable (CV)

structure, one in which many or most of the syllables end with vowel sounds (e.g., *papa, suma*). An example spelling from a Spanish speaker is FLOUT for *float* in which the student may have been extending the pronunciation of the long **o** as two separate vowels.

4. There is greater variability in the spelling of English learners. English learners may appear inconsistent in their spelling; they can spell some words at particular developmental levels, but have gaps in performance. For example, a student may spell *happy* and *ocean* correctly, but spell *kite* as KIT and *bed* as BEAD. Many English learners memorize the spelling of words that are beyond their basic orthographic knowledge, perhaps because they are older with greater conscious analysis and memorization skills. This variability can lead one to think that English learners use fundamentally different strategies, but once these unexplained misspellings are removed from the mix, a developmental picture does appear.

5. Students may omit ending and middle syllables. Often, English learners omit final sounds because these sounds do not occur in the same positions in their primary languages. An example spelling from a Hmong-speaking student is CAMP for *camped.* In addition, the internal syllables of polysyllabic words may represent an overload of new sounds, and the least familiar are omitted.

6. While it was noted that English learners continue to progress through the developmental stages in the same sequence as native speakers, the development of orthographic knowledge often takes longer for English learners. For instance, English learners were much more likely to be classified as letter name-alphabetic spellers into the third grade year or beyond.

How the Case Studies Illustrate the Six Patterns

In the first case study presented, we considered David, a first grade student at the early letter name stage of spelling. David's case exemplifies two of the patterns in the spelling development of English learners: 1) He was following a predictable developmental trajectory, but at a slower pace, and 2) There was greater variability in his representation of sounds in his developmental spelling, such as his use of GWM for *gum,* and RHB for *rob.*

The case of Bao, a second-grade Hmong student, exemplified several of the key findings as well. Bao had difficulties with minimal contrasts between English and Hmong, such as a difficulty with the final /l/ in her writing of *growl* as GRWN, and the /th/ in *thorn* that was written as TORN. Bao exhibited greater variation in spelling attempts—writing POK for *hop,* HIHI for *wishes.* Bao omitted ending sounds such as HOTI for *shouted,* HIHI for *wishes*; these miscues may reflect her phonological perception of English. Bao is another example of a student for whom orthographic development is taking longer—at spring in her second grade year she is at the middle letter name-alphabetic level.

Reyna's literacy development illustrates the developmental lag present for many English learners. Because she is in a situation where school expectations are close to three years beyond her understanding of written English, it is unlikely that fourth grader Reyna is receiving focused instruction matching her developmental level in the classroom. Reyna has learned to spell many words with short vowels, but her knowledge is spotty; for example, she can spell *stick* but not *pet* correctly (PAT). She has learned to read nearly all single syllable and most two-syllable words, but her comprehension is constrained by vocabulary knowledge. The trade-off between accuracy and rate was not a success in the reading of the third grade passage, and Reyna can be described as trying to comprehend from partial cues.

As an adult learner, Margaret reflected many of the patterns we observed in orthographic development for English learners; she also had strengths that grew from years of exposure to spoken and written English. The gap between her reading and spelling was too great—note the many polysyllabic words that Margaret could read and how many easy words she could not spell. What she had learned about word structures was not generative, and a step back to examine principles and patterns of words was called for.

Margaret's spellings often reflected minimal contrasts between Spanish and English. She also reflected the principle of in-depth sounding out. Students whose primary languages have shallow orthographies like Spanish are accustomed to a broad alphabetic layer, and they use the alphabetic principle to elongate the sounds of long **a, i,** and **o**, vowel diphthongs. For example, Margaret spelled *train* as TREIN using the Spanish *e* for the sound of long **a** and *i* for the sound of the long **e**.

Implications

The six patterns may be helpful to researchers as they explore the spelling strategies of other English learners, and of use to teachers as they assess students' word knowledge and plan word study instruction. It is clear from our data that English learners apply the linguistic knowledge they bring from their home languages to tasks in oral and written English. Because of this, teachers will benefit from learning about the specific language resources that students bring with them to the classroom. A chart of the phonemes in English can be compared to the sounds of other languages to determine those sounds that are common and those with close contrasts. Teachers who learn about the phonological, syntactic and vocabulary contrasts distinguishing students' home languages from English will be better able to note the interactions that take place in students' writing and reading tasks in the classroom. The more teachers know, the more they can make direct connections to their word study instruction.

Our data showed that there is a developmental lag for English learners as they grasp the English orthography. This lag seems to be related to students' acquisition of oral English. The fact that orthographic development is extended for students learning English presents both opportunities and challenges in providing effective literacy instruction. On the positive side, we are seeing that a developmental model may apply equally well to students learning English. Teachers can look for progress and set the scope and sequence of learning goals in a manner similar to their monolingual English students. Some skills within the scope and sequence may be more difficult for students whose home language differs in sound or orthography from English. Students will need to focus first on the easier, more-obvious contrasts among languages and orthographies. As these skills are mastered, students can focus on finer contrasts between their primary language and English.

Because students at more advanced grade levels may still be applying an earlier developmental perspective on written language, teachers at all levels are challenged to be familiar with the full spectrum of orthographic learning. Growth in oral language facilitates written word knowledge, so it is important that phonics and spelling instruction is integrated with meaningful vocabulary instruction. The reverse is also true—there are many ways that literacy learning influences language development (Morais, 1986). For example, during the within word pattern stage students' exposure to written English spelling patterns is sufficient to influence the way students pronounce particular vowels (Cantrell, 2001). During this stage, teachers can help students make connections between the

spelling of words and their pronunciation, such as in *blank/plank* or *her/hear*. In daily instruction, there is a potentially powerful interaction between language and literacy instruction where students build on what they know, engage in meaningful activities that draw attention to words and the richness of languages, and apply their knowledge to the English writing system.

A number of the implications we have discussed are likely to apply to students who speak non-standard dialects of English. In the interweave of languages in the classroom there are also native English speakers whose regional and cultural language patterns influence the way they perceive English (Labov, 2003; McCabe & Bliss, 2003). Teachers may see examples of the six patterns, especially the substitution of letters for sounds with minimal contrasts, in the spellings of their students who speak non-standard dialects.

There are extensive implications for future research relating to orthographic development for English learners. First, qualitative analyses of spelling assessments for students from languages besides Spanish are in great need. Secondly, more research is vital to understand the best ways to implement spelling and word study in a meaningful context with English learners. Finally, studying the effects of word study instruction that has been geared to the specific needs of English learners will provide important data to ensure that precious instructional time in the classroom is being used to maximum effect.

This paper has illuminated a number of ways that the spelling of English learners serves as a window into their orthographic knowledge. We examined how developmental spelling samples collected from English-learning students contribute to a model of orthographic development previously established for monolingual English speakers. With a richer and increasingly diverse collection of student spelling samples, the monolingual model of orthographic development becomes a more helpful structure for supporting the literacy learning of all students.

REFERENCES

Bear, D. R. (1992). The prosody of oral reading and stage of word knowledge. In S. Templeton & D. Bear (Eds.), *Development of orthographic knowledge and the foundations of literacy: A memorial Festschrift for Edmund H. Henderson* (pp. 137–186). Hillsdale, NJ: Lawrence Erlbaum.

Bear, D. R., Helman, L. A., Templeton, S., Invernizzi, M. & Johnston, F. (2007). *Words their way with English learners: Word study for phonics, vocabulary and spelling instruction.* Upper Saddle River, NJ: Pearson Prentice Hall.

Bear, D. R., Invernizzi, M., & Templeton, S., & Johnston, F. (2004). *Words their way: Word study for phonics, vocabulary, and spelling instruction,* 3rd edition. Upper Saddle River, NJ: Prentice Hall.

Bear, D. R. & Templeton, S. (2000). Matching development and instruction. In N. Padak, et al. (Eds.), *Distinguished Educators on Reading: Contributions that have shaped effective literacy instruction* (pp. 334-376). Newark, DL: International Reading Association.

Bear, D. R., Templeton, S., Helman, L. A., & Baren, T. (2003). Orthographic development and learning to read in different languages. In G. G. Garcia (Ed.) *English learners: Reaching the highest level of English literacy.* Newark, DE: International Reading Association.

Bialystok, E. & Mc-Bride-Chang, C. (2005). Bilingualism, language proficiency, and learning to read in two writing systems. *Journal of Educational Psychology, 97*(4), 580-590.

Cantrell, R. J. (2001). Exploring the relationship between dialect and spelling for specific vocalic features in Appalachian first-grade children. *Linguistics and Education, 12,*1-23.

Cronnell, B. (1985). Language influences in the English writing of third- and sixth-grade Mexican-American students. *Journal of Educational Research, 78,* 168-173.

De Avila, E. A. & Duncan, S. E. (1994). *Language Assessment Scales.* Monterey, CA: CTB Macmillan/McGraw-Hill.

Dressler, C. A. (2002). *Inter- and intra-language influences on the English spelling development of fifth grade, Spanish-speaking English language learners.* Unpublished doctoral dissertation, Harvard University, Cambridge, MA. *Dissertation Abstracts International, 63,* 145.

Dressler, C. & Kamil, M. (2006). First- and second-language literacy. In D. August & T. Shanahan (Eds.) *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth* (pp. 197-238). Mahwah, NJ: Lawrence Erlbaum Associates.

Edwards, W. (2003). Charting the orthographic knowledge of intermediate and advanced readers and the relationship between recognition and production of orthographic patterns. Unpublished doctoral dissertation. University of Nevada, Reno.

Ehri, L. C. (2005). Learning to read words: Theory, findings, and issues. *Scientific Studies of Reading, 9*(2), 167-188.

Fashola, O.S., Drum, P. A., Mayer, R. E., & Kang, S. (1996). A cognitive theory of orthographic transitioning: Predictable errors in how Spanish-speaking children spell English words. *American Educational Research Journal*, *33*, 825-843.

Ganske, K (1999). The developmental spelling analysis: A measure of orthographic knowledge. *Educational Assessment, 6.* 41-70.

Helman, L. A. (2005). Spanish speakers learning to read in English: What a large-scale assessment suggests about their progress. In B. Maloch, J. Hoffman, D. Schallert, C. Fairbanks, & J. Worthy (Eds.), 54th Yearbook of the National Reading Conference (pp. 211-226). Oak Creek, WI: National Reading Conference.

Henderson, E. H. (1981). *Learning to read and spell: The child's knowledge of words.* DeKalb, IL: Northern Illinois Press.

Henderson, E. H. (1990). *Teaching spelling* (2nd ed.). Boston: Houghton Mifflin.

Henderson, E. H. & Beers, J. (Eds.) (1980). *Developmental and cognitive aspects of learning to spell: A reflection of word knowledge.* Newark, DE: International Reading Association.

Henderson, E. H., Estes, T., & Stonecash, S. (1972). An exploratory study of word acquisition among first graders at midyear in a language experience approach. *Journal of Reading Behavior*, *4*, 21–30.

Howard, E. R., Arteagoitia, I., Louguit, M., Malabonga, V., & Kenyon, D. M. (2006). The development of the English Developmental Contrastive Spelling Test: A tool for investigating Spanish influence on English spelling development. *TESOL Quarterly, 40*(2), 399-420.

Invernizzi, M. (1992). The vowel and what follows: A phonological frame of orthographic analysis. In S. Templeton & D. R. Bear (Eds.), *Development of orthographic knowledge and the foundations of literacy: A memorial Festschrift for Edmund H. Henderson* (pp. 106–136). Hillsdale, NJ: Lawrence Erlbaum.

Invernizzi, M. & Hayes, L. (2004). Developmental-spelling research: A systematic imperative. *Reading Research Quarterly, 39,* 216-228.

Invernizzi, M. & Meier, J. (2001). *Phonological Awareness Literacy Screening 2001-2002.* Charlottesville, VA: The Rector and the Board of Visitors of the University of Virginia.

Labov, W. (2003). When ordinary children fail to read. *Reading Research Quarterly,* (38) 1, 128-131.

McCabe, A., & Bliss, L.S. (2003). Summary of NAP for children and adults. In A. McCabe & L.S. Bliss (Eds.), *Patterns of narrative discourse: A multicultural, life span approach* (pp. 171-177, 121-122). Boston: Allyn and Bacon.

Morais, J., Bertelson, P., Cary, L., & Alegria, J. (1986). Literacy training and speech segmentation. *Cognition, 24*, 45-64.

Morris, D., Bloodgood, J. W., Lomax, R. G., & Perney, J. (2003). Developmental steps in learning to read: A longitudinal study in kindergarten and first grade. *Reading Research Quarterly,* 38 (3), 302-328.

Padolsky, D. (2005). *How many school-aged English language learners (ELLs) are there in the U.S.? National Clearinghouse for English Language Acquisition.* Retrieved February 28, 2006 from http://www.ncela.gwu.edu/expert/faq/01leps.htm.

Read, C. (1971). Preschool children's knowledge of English phonology. *Harvard Educational Review*, *41*, 1-34.

Read, C. (1975). *Children's categorization of speech sounds in English*. (NCTE Report No. 17) Urbana, IL: NCTE.

Templeton, S. (1989). Tacit and explicit knowledge of derivational morphology: Foundations for a unified approach to spelling and vocabulary development in the intermediate grades and beyond. *Reading Psychology, 10,* 233-253.

Templeton, S. (2003). Spelling. In J. Flood, D. Lapp, J. R. Squire, & J. M. Jensen (Eds.), *Handbook of research on teaching the English language arts* (2nd. Ed., pp. 738-751). Mahwah, NJ: Lawrence Erlbaum Associates.

Templeton, S. & Morris, D. (2000). Spelling. In M.L. Kamil, P.B. Mosenthal, P.D. Pearson & R. Barr (Eds.) *Handbook of Reading Research: Volume III* (pp. 525-544). Mahwah, NJ: Lawrence Erlbaum Associates.

Tolchinsky, L. & Teberosky, A. (1998). The development of word segmentation and writing in two scripts. *Cognitive Development, 13,* 1-24.

Zutell, J. & Allen, J. (1988). The English spelling strategies of Spanish-speaking bilingual children. *TESOL Quarterly, 22,* 333-340.