Bilingualism and Literacy: Problem or Opportunity?
A Synthesis of Reading Research on Bilingual Students

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Abstract

The Office of Bilingual Education and Minority Languages Affairs (OBEMLA) within the United States Department of Education commissioned a set of papers to begin to gather research relevant to the development of reading among English Language Learners (ELL's). These papers draw from national and international reading research on monolingual and bilingual students. This article synthesizes and discusses these findings within the context of national literacy policy as reflected by the National Reading Panel recommendations of 1999. It is hoped that this discussion will provide guidance to the development of quality pre-service and in-service literacy training programs, instructional materials, and accountability procedures to provide bilingual students with optimal teaching and learning opportunities.

Briefly, all students, regardless of which language(s) is (are) spoken, must develop an awareness of phonology and syntax if they are to become literate.   Such awareness begins to develop as infants begin to learn to interact with their caregivers. The development of listening comprehension is also a necessary condition for reading readiness. The variety, amount, frequency, and quality of interactions greatly influence the development of phonological and syntactic awareness; as such, the home environment is a critical component in developing reading readiness skills. What is special for bilingual children is that such awareness is developed more quickly and successfully in their primary language. Contrary to popular opinion, developing the child's primary language skills does not delay, but rather can accelerate the development of English literacy skills. While there are similarities between different languages in how reading skills develop, there are also marked differences. These language differences impact the development of literacy skills in the second language. Several areas for future research are also discussed.

Introduction

Learning to read is essential for every child. In 1998, Congress approved the creation of a National Reading Panel (the NRP) to initiate a national comprehensive research-based effort on alternative instructional approaches on reading instruction and to guide the development and implementation of public policy on literacy instruction. To this end, the Office of Bilingual Education and Minority Language Affairs commissioned a set of papers to draw together research on how best to support literacy development among one of the largest and fastest growing sector in our public schools: bilingual students. The purpose of the OBEMLA-commissioned papers is to make explicit how language development, especially bilingualism, is addressed in reading research.

This paper begins with an overview of data documenting why the issues of language development and bilingualism are critical if national literacy efforts are to be successful. The five sections that follow the overview correspond to each of the NRP's domains of reading, cross-referenced to their educational levels. This research synthesis organizes the findings according to each NRP suggestions, with appropriate commentary on recommended activities. Thus, the NRP domains provide the framework for organizing the synthesis of the research findings. The final section of this paper details areas for future research.

The information provided will be helpful in guiding professional development, instruction, curriculum development, assessment, and research in support of helping bilingual students develop the highest possible literacy levels. While the commissioned papers do not represent a comprehensive review of the extant literature, they do represent a major seminal effort to assure the success of the reading reform agenda.

Why are language development and bilingualism important issues in literacy?

Improving reading achievement for all students is one of the major goals of the United States Department of Education's national reform agenda. Literacy is one of the most fundamental academic skills, important in its own right and essential for success in all other academic areas.

The National Assessment of Educational Progress (NAEP) indicates that a significant proportion of students are not able to read successfully. NAEP finds that the proportion of students deficient in reading varies from 25% in wealthier schools to over two-thirds in high poverty schools (NAEP, 2000). Limited English Proficient (LEP) students account for a significant portion of these low-performing students.

Limited English Proficient students are not only one of the largest, but also one of the most rapidly growing sectors of our total student population. Yet, LEP students, especially those with Spanish as their primary language, are twice as likely to be below the reading level of their White or Asian American peers (Hispanic Dropout Project, 1996; NCES, 1997; NAEP, 2000). For example, Hispanic students represent three-fourths of the 10 million language minority students in U.S. schools. Forty-three percent speak a language other than English in their home (NCES, 2000). Hispanic students, especially those who are LEP, consistently are among those with the lowest levels of literacy (42% of Hispanic students are in the bottom quartile, two-thirds are below 50%) (NAEP, 2000). Hispanic students tend to come from homes that are poor and with parents having limited formal education. Approximately two-thirds of Hispanic students can be described as being bilingual (NCES, 2000). While bilingualism in of itself is not seen as the cause of reading difficulties, the relationship of speaking two or more languages to reading development in these different languages is not understood.

Because of the critical role that language development has in reading, the role of bilingualism in the development of reading skills needs to be clearly delineated. To this end, the Office of Bilingual Education and Minority Language Affairs within the United States Department

of Education commissioned a set of papers to begin to gather research relevant to the development of reading among LEP students.   The commissioned papers were guided by four questions:

1. What role does bilingualism have in literacy development?
2. What instructional strategies are most effective for improving literacy development among the range of LEP students (e.g., by age, grade level, L1 and L2 language proficiency, socioeconomic class, and culture)?
3. How can we best prepare teachers to provide quality-reading instruction to LEP students?
4. How can we best assess the progress and achievement in reading among LEP students?

The goals of these papers were twofold: 1) to identify research-based information that could guide policy and practice in the design, implementation, and evaluation of reading instruction and teacher preparation; and 2) to identify critical questions and issues related to reading development among LEP students requiring additional research.

The purposes of this paper are to synthesize the information provided through the commissioned papers and to relate these findings to the national reading reform initiatives. To facilitate the integration of this information into the national reform agenda, the results and discussion are organized according to the domains of reading and educational levels of the NRP (Table 1). Understanding the NRP domains is critical as they define the primary thrust of the federal reading initiative and activities.

Table 1
National Reading Panel Domains of Reading[1] and Educational Levels
Addressed by Commissioned Papers

Reform Efforts at Various Educational Levels			
NRP Domains of Reading	**Early Childhood Level I**	**Early Elementary Level II**	**Late Elementary Level III**
A. The skills and knowledge to understand how phonemes or speech sounds are connected to print.	Durgunoglu and Oney, 2000 Escamilla, 2000 Söderbergh, 2000		
B. The ability to decode unfamiliar words.			
C. The ability to read fluently.	Durgunoglu and Oney, 2000 Escamilla, 2000 Fletcher, et al., 2000 Guerrero and Sloan, 2000	Barrera and Jiménez, 2000 Guerrero and Sloan, 2000 Escamilla, 2000	Barrera and Jiménez, 2000 Durgunoglu and Oney, 2000 McLaughlin et al., (presented by August),

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[1] "Domains" refer to a combination of REA student learning objectives and NRP Principles, Findings and Determinations, adapted to fit a table and to organize the summary of commissioned papers.

			2000
D. Comprehensive Strategies: sufficient background information and vocabulary to foster reading comprehension	Durgunoglu and Oney, 2000 Escamilla, 2000		McLaughlin et al., (presented by August), 2000
E. Family Literacy	Söderbergh, 2000 Durgunoglu and Oney, 2000		

The following discussion highlights the underlying rationale for the NRP.

Background to the Department of Education's Reading Reform Effort

In 1998, Congress called for the use of research-based information to improve reading instruction in high poverty, low performing schools as well as to improve the professional development of teachers and training for parents to provide quality-reading instruction. One of the first initiatives in this effort was Congress' passage of the Reading Excellence Act (REA) in 1999. Five REA program objectives were specified: 1) to provide early childhood children with reading readiness skills; 2) to teach every child to read by grade 3; 3) to improve reading in late elementary; 4) to improve instructional practices of elementary teachers and other instructional staff; and 5) to provide additional support for students having difficulty making the transition from Kindergarten to Grade 1, particularly those having difficulty with reading skills.

Reading research has begun to identify some of the skills that contribute to successful readers. These factors provide the rationale for the REA key principles, i.e., student learning objectives: 1) the skills and knowledge to understand how phonemes or speech sounds are connected to print; 2) the ability to decode unfamiliar words; 3) the ability to read fluently; 4) the development of background information and vocabulary sufficient to foster reading comprehension; and 5) the development and maintenance of a motivation to read. Students must develop each of these proficiencies if they are ever to become successful readers.

Reading research has also helped us to identify what we can do to develop successful readers.   REA program activities included: 1) improving reading instruction through better professional development; 2) providing out-of-school tutoring; 3) supporting and expanding opportunities for family literacy through parent/child literacy interactive activities, early childhood education, adult literacy, and parent education; 4) providing programs to help Kindergarten students transition into Grade 1 literacy; 5) developing relevant and appropriate curriculum and supportive materials; and 6) fostering reading and library programs that provide access to engaging reading materials and coordination of local reading, library, and literacy programs. The extent to which each of these activities is fully developed and available to a child greatly increases the likelihood the child will become a highly proficient reader. The key principles and primary activities outlined above are issues that cut across each of the REA objectives. For example, to have every child reading by grade 3 requires that each child be able to connect phonemes and sounds to print, decode unfamiliar words, read fluently, develop vocabulary needed for reading

comprehension, and develop a motivation to read. For this to occur, teachers and parents will need to know how to teach and support reading development; children must have a reading program that facilitates reading transition from Kindergarten to first grade; reading materials must be relevant to students; and children must be provided with access to reading materials in the school, home, and community. Thus, the key principles and primary activities are the necessary conditions to realize each of the REA objectives.

Reading Research Context: Findings From the National Reading Panel

In 1997, Congress requested that the National Institute of Child Health and Human Development (NICHD) collaborate with the Secretary of Education to convene a national panel of experts in reading research, representatives of colleges of education, reading teachers, educational administrators and parents. This expert panel was to review research regarding the effectiveness of alternative instructional approaches to teaching students to read. Their findings were to be used to guide the development and implementation of public policy to improve literacy instruction for all students. This National Reading Panel (NRP) was to also identify areas for additional research. The NRP seriously considered the work of the National Research Council's (NRC) "Preventing Reading Difficulties in Young Children" (Snow, Burns, and Griffin, 1998). The NRC Committee's report identified the critical skills, environments and types of activities that were critical to the development of early literacy skills. However, their report neither clearly focused on how best to teach reading nor on the best curriculum materials to teach reading to students with a wide range of abilities. This omission directed the work of the NRP.

The NRP decided to identify research on instruction, curriculum, and professional development that focused on a list of topics found to be critical to literacy development. The NRP developed a clear set of criteria and processes by which to determine which research was sufficiently methodologically rigorous in terms of reliability, validity, replicability, and applicability. Given the breadth of the field of reading, the Panel identified a narrow set of topics deemed critical by the NRC and by the public in regional open hearings. Through these efforts, the NRP decided to target research in the following areas: Alphabetics (phonemic awareness instruction, phonics instruction), Fluency, Comprehension (vocabulary instruction, text comprehension, teacher preparation and comprehension strategies instruction), Teacher Education and Reading Instruction and, finally, Computer Technology and Reading Instruction. The following section summarizes the findings from the NRP (National Reading Panel, 1999).

The NRP found that explicit instruction in phonemes improved students' initial reading skills and spelling. Phonemic awareness training was very effective with students in a number of different learning contexts, with a wide range of abilities, grade, and age levels. The positive effects of this training lasted well beyond the initial training. Instructional activities that were most successful in developing phonemic awareness included: 1) explicit and systematic teaching of students on how to manipulate phonemes with letters; 2) limiting the number of phonemes

manipulated to one or two; and 3) working with a small number of students at one time. However, phonemic awareness training is only one of several skills that a student must develop to become a good reader. More research is needed to help guide teachers in selecting the appropriate instructional method for students with different learning needs as well as how to develop and maintain student and teacher motivation.

Phonics instruction helps students learn to relate sounds and letters for reading and spelling. Research suggests that systematic phonics instruction is most successful for early elementary students (K and Grade 1), especially among those with reading problems. Phonics instruction also leads to improved spelling among students who read well. However, phonics instruction is not at all helpful in developing the more complex comprehension skills needed in the upper elementary grades. In the same vein, the NRC cautioned against designing a reading program limited to phonics instruction. As with phonemic awareness, phonics instruction is seen as a component of a total reading program. Additional research is needed to define how much, for how long, and how phonics instruction should be provided, as well as how best to train teachers to provide and evaluate a quality phonics program.

Reading fluency is as important to reading proficiency, as is phonemic awareness. A fluent reader can read aloud quickly, smoothly, correctly, and with the right intonation. Reading fluency is critical to comprehension. Guided repeated oral reading and independent silent reading are two instructional strategies that can promote reading fluency. Such efforts have been successful in a wide range of learning contexts, instructional materials, student abilities, and reading skills. More research is needed to understand how guided oral reading facilitates the development of reading fluency and to determine the extent to which, if at all, silent independent reading leads students to read more as well as improve their reading fluency.

The development of comprehension is not only critical to good literacy skills, but also to all academic learning. Comprehension is not a passive process, but rather one requiring readers to think about what they are reading. Directly teaching and developing vocabulary development is critical to the development of strong comprehension skills. "Repetition and multiple exposures to vocabulary items are important. Learning in rich contexts, incidental learning, and use of computer technology all enhance the acquisition of vocabulary. Direct instruction should include task restructuring as necessary and should actively engage the student" (NRC, p. 14, 1999). Simply, the more words you know, the easier it is to understand what you are reading. Also, reading proficiency increases as the amount of reading practice and the variety of reading tasks increase. Care must be taken to ensure that the instructional strategies used for vocabulary instruction consider carefully the grade and age of the student. Research is needed to assess the relative effectiveness of alternative instructional strategies and methods in vocabulary development. Work is also needed to develop appropriate instruments and processes to assess vocabulary development.

Research reveals that comprehension is increased when the content is relevant to the lived experiences of the reader, and when the reader is able to develop a mental image of what was read. Thus when students are taught, either through modeling or demonstration, to use cognitive organizers or develop strategies for processing the information they are reading, their

comprehension skills increase. Such strategies include: monitoring comprehension, using cooperative learning groups, using graphic and semantic organizers, answering questions, generating questions, using story structure, and summarizing. These strategies are most effective when used in combination. Research finds that, once these strategies are learned, students improve their recall, ability to answer and generate questions, and ability to summarize what they read. Given the complexity of reading comprehension and the concomitant instructional strategies, teacher training in comprehension should begin at the earliest stages of pre-service training to provide as much time for its development. Equally clear, there is little or no information regarding reading content and teaching standards, appropriateness of these strategies with students at different grade levels and age, types and difficulty levels of text, or, most importantly, how best to train teachers to use these strategies appropriately. Regarding the latter, it is remarkable that there is almost no information on how teachers should be trained, the amount of training time needed, or how to determine that they have developed the necessary instructional skills.

As educational technology is still relatively new, there is little research on how technology can best be used to support literacy development. The NRP also called for research on how speech recognition and multimedia can be used to support reading instruction. This summary of the NRC's findings is important given the important role they played in framing the NRP reading domains and educational levels. What is also extremely crucial is to remember a most significant limitation of the NRC report: "The Panel did not address issues relevant to second language learning..." This points to the complementary value of the papers commissioned by OBEMLA. The findings of the commissioned papers provide some guidance as to how the NRP domains and educational levels might best be realized with LEP students.   Table 1 summarizes the results from a review of these papers organized using a matrix reflecting REA objectives, key principles, and activities.

Findings

The following information is drawn from the papers commissioned by OBEMLA. These papers do not purport to represent an exhaustive or comprehensive review of the entire body of literature addressing language development and bilingualism and reading. Nonetheless, as a seminal effort by OBEMLA, these papers do provide a range of research findings and direction for future work and research.

Education Reform Effort at Level I (Early Childhood - Preschool)
To provide reading readiness skills to children at early stages.

This first objective seriously attempts to identify those factors and conditions that are necessary to prepare a child to begin literacy development. It is here that the issue of language development emerges as a unique issue for English language learners, specifically the importance of oral language receptive and production skills. Knowing the sounds of a language is a precondition for being able to begin to match it with print. This objective also is concerned with identifying and maximizing the development of these preconditions, e.g., the role of the caregiver, home, and community in the development of oral language receptive and production skills.   The

principles that follow are those that were identified by the NRP in its review of the research as essential skills and experiences needed for successful development of reading skills.

Domain A: The skills and knowledge to understand how phonemes or speech sounds are connected to print.

This domain focuses on identifying how we can improve reading readiness skills among pre-school, Kindergarten and first-grade students. Reading research is available from studies of beginning readers who are: monolingual English speakers, monolingual speakers of languages other than English, and bilingual speakers (Durgunoglu, 2000). Comparisons of the research results from each of these language groups can help us to begin to understand the relationship between language and reading.

Monolingual English Speakers

There is a general consensus that successful early readers develop an awareness of phonology, syntax, and functional uses of language. Current theory maintains that to read and write fluently, a child needs to understand the spoken language and understand how this spoken language is represented in written form (see also Södebergh's studies on deaf children, included in this publication). Such understanding is referred to as phonological awareness. The child also needs to understand how and why written language is used to be familiar with the symbols used in the written language, to be aware of certain characteristics of spoken language, and to understand the systematic relationship between the components of spoken language and the concepts of written language. Such phonological awareness is highly correlated with word recognition and spelling. Instructional practice to develop such awareness begins with the introduction of consonant sounds followed by vowels.

Listening comprehension and decoding encompass some of the basic cognitive processes required in reading and writing. Syntactic awareness, i.e., word order and grammar, affects both decoding and listening comprehension (e.g., monitoring on-going comprehension, enhancing or verifying incomplete visual and phonological information). Syntactic awareness as measured by knowledge of print is also a good predictor of spelling performance.

Functional awareness of print, i.e., written conventions of language, is related to the ability to discriminate letters and phonological awareness. Memory and speed with which information is processed directly influences the quality and efficiency of specific reading processes such as decoding, word recognition, and comprehension. Learning the actual patterns of a language requires extensive experiences with the words of that language through reading and writing. Reading and writing development in English for monolingual English speakers is enhanced when they become aware of certain patterns of the English language via activities that provide substantive practice such as on-set and rime. Knowledge of on-set and rime facilitates both decoding of words in reading and learning to spell and write words correctly. Given that the NRC did not include reading research with monolingual non-English speakers or bilingual speakers, it is not surprising that the research as to how monolingual English speakers begin to connect phonemes or speech sounds to print is consistent with recommended practices.

Monolingual Non-English Speakers

Research on the development of early reading skills notes many similarities as well as important differences between monolingual non-English speakers and monolingual English speakers. The unique structure of orthography for different languages greatly impacts the relationship between the orthography, phonology, morphology and meaning in the processing of print (Durgunoglu and Oney, 2000).

For example, Turkish literacy skills appear to develop as they do in English. However as a result of the different orthographies and phonologies, some reading skills will develop at different rates. This is also true for German, Czech, and Italian monolingual speakers (Durgunoglu and Oney, 2000). We find that phonological awareness in Turkish only contributes to word recognition in the early stages of reading as it does in English. As word recognition skills become highly developed, only listening comprehension can differentiate between readers at different levels of reading comprehension (Oney, Peter, and Katz, 1997). This transfer tends to occur more quickly among monolingual English speakers because of the more transparent features of English orthography.

Studies of monolingual Spanish speakers reveal that, in contrast to English, vowels should be taught before consonants in beginning reading programs (Escamilla, 2000). Escamilla, et. al., found that, like English speakers, Spanish speakers also use language patterns to develop their reading and writing skills. However, because of the unique orthographic and syntactic features of Spanish, the language patterns used by monolingual Spanish speakers differ from those used by their monolingual English-speaking peers (Escamilla and Cody, 2000).

Söderbergh (2000) reports on a series of studies of beginning reading done with Swedish children, some of whom are deaf or severely hard of hearing. If print is introduced to infants and toddlers through natural playful exchanges with a caregiver, as we usually do as we try to teach very young children to talk, they are able to develop reading skills much as they do their speaking skills. This process can begin with infants as young as 6 months. Typically we tend to use the "look-point-say name" game with infants to help them develop their receptive and pre-productive oral language skills. Söderbergh used this same approach, but added a flash card with the name of the object. Thus the child could hear the name of the object as well as concomitantly see the name of the object printed on a flash card. Within 1 to 3 months after continued exposure, children demonstrated that they were paying attention to the words and letters on the flash cards. This signals the child's initial step towards connecting what they hear with what they see in print. By 24 months these toddlers began to break words down into morphemes. In addition they began to explore the sounds and letters not found in ending morphemes by contrasting syllables and rime. Children who are introduced to print in this way are much more proficient in learning new words more quickly than their peers who have not had such early reading experiences. There is also evidence documenting how exposure to different writing styles and genres helps early readers shape their oral and written language development. These findings are also applicable to deaf and severely hard of hearing children.

When the approach outlined above was used with deaf and severely hard of hearing children Söderbergh (2000) found that they were able to learn to read even when they could not hear. The "look-point-name" game was changed to "look-point-show flash card" game. Learning is focused at this stage on what a word means, not on the details of how the word is spelled. This approach helped these children to develop reading and writing skills with the help of their reading partners. As their writing skills develop, deaf and severely hard of hearing children begin to develop "face-to-face" language, whether sign language or spoken language.

Bilingual Speakers

The amount of research on bilingual speakers is quite limited. What has been done on school-age children is consistent with the results of studies of monolingual Spanish speakers. Simply, it is best to teach vowels prior to consonants in beginning reading programs. This approach is quite different from that traditionally used with monolingual English speakers wherein consonants are introduced first. Increased phonological awareness in L1 improves spelling in L2 (Durgunoglu, Arino-Marti, and Mir, 1993a; Durgunoglu, Mir, and Arino-Marti, 1993b). Access to two languages, and the possibility of contrasting those languages are insights that can facilitate literacy development (Durgunoglu and Oney, 2000).

Domain B: The ability to decode unfamiliar words.

Aside from the research provided by Söderbergh cited above, no information was presented on how to help early childhood children develop the ability to decode unfamiliar words.

Domain C: The ability to read fluently.

While Domain A focuses on identifying those preconditions necessary for initiating formal literacy instruction, the ability to comprehend oral language is also an essential precondition for developing reading fluency.

Monolingual English Speakers

Only one of the commissioned papers highlighted factors that can be considered a building block towards the development of reading fluency; the one by Durgunoglu and Oney. The authors find that language comprehension is a major determinant of listening and reading skill development. As we learned earlier, meaningfulness of text impacts reading fluency. Here we find that a reading task is more meaningful when the content draws from the specific cultural experiences of the reader (Street, 1994). Thus we can expect that reading fluency in early readers can be supported through the provision of culturally relevant material.

Monolingual Non-English Speakers

No direct reference was found among the commissioned papers.

Bilingual Speakers

A series of studies find that the best entry into literacy is through the use of a child's native language (Clay, 1993; Snow, Burns, and Griffin, 1998). This is consistent with the research reported earlier noting the importance of establishing the sound-letter relationships; and beginning to relate the structures of oral language to print, as well as oral comprehension to reading comprehension. Very young children bring to the initial reading task knowledge of these skills in their primary language (L1). Literacy in a child's home language provides knowledge, concept and skills bases that transfer to reading in a second language (L2), e.g., English (Collier and Thomas, 1992; Cummins, 1989; Escamilla, 1987; Modiano, 1968; Rodríguez, 1988; Carter and Chatfield, 1986). This is supported by research showing that proficiency in L1 literacy skills is highly correlated with the development of literacy skills in L2 (Collier and Thomas, 1995; Greene, 1998; Krashen and Biber, 1987; Leshere-Madrid, and García, 1985; Ramírez, Yuen, and Ramey, 1991). Contrary to current debates on language policy, bilingualism does not interfere with the development of English literacy. Young children learning two languages develop and use vocabulary and phrases at the same rate as children learning only one language (Escamilla, 2000). There is emerging evidence that bilinguals are able to access both languages in a range of literacy, communicative, and problem solving tasks (Escamilla, 2000;Grosjean, 1989). As emergent bilinguals in Spanish and English concomitantly use both languages when reading and writing (Escamilla and Andrade, 1992; Escamilla, Andrade, Basurto, and Rice, 1996; Escamilla, Loera, Rodríguez, and Ruiz, 1998), language proficiency and concept development in bilinguals, especially for young children, should include L1 and L2 (Grosjean, 1989; Escamilla, 1998, 2000).

A collective holistic view of bilingualism must acknowledge that two languages produce a unique and specific speaker-hearer (Grosjean, 1989). Contrary to traditional interpretations that consider bilinguals who use two languages simultaneously as reflecting inadequate language development, Escamilla finds that such concomitant use of two languages is neither problematic nor does it signify deficiency in either reading or writing, but actually indicates a strength, drawing support from both languages as needed (Escamilla 1994b; Escamilla, Andrade, Basurto, and Ruiz, 1996). This interpretation appears to have a biological basis.

Research finds that the brain becomes lingual through exposure to language and does not prefer one language over another (Fletcher, et al., 20004; Leman, Bates, Johnson, and Karmiloff, 1998). Through exposure to language, changes occur in the left frontal and parietal lobes of the brain that lead to the development of neural networks that support language production and comprehension (respectively) (Fletcher, et al., 2000; Ojemann, 1991; Simos, Breier, Zourdakis, and Papanicolaou, 1998; Penfield and Roberts, 1959; Ojemann and Whitaker, 1978). It also appears that different languages within an individual are mediated by common neural systems (Chee, et al., 199a,b; Illes, et al., 1999; Klein, et al., 1999). These findings suggest that, regardless of the number of languages known by the individual, all language skills (speaking, reading, writing, and comprehension) are located in the same areas of the brain. The individual then is able to draw upon this common pool of knowledge and skills in whatever language these skills are most accessible. This interpretation is very consistent with Lambert's notion of "additive bilingualism." However, with increased language proficiency, the individual learns to become more selective and consistent in the use of a single language in specific language contexts. In

depth studies of Spanish and English literacy development in bilingual students find some similarities and significant differences in emergent reading and writing behaviors. These differences become even greater as grade level increases (Escamilla, 1994a, 1999, 2000; Escamilla, Andrade, Basurto, and Ruiz, 1996; Escamilla and Coady, 2000). As auditory and oral language development are prerequisites for learning to read in English, phonemic awareness should be taught in the pre-reading stage of literacy development (Adams, 1990). In contrast, as phonemic and phonological awareness are integral components of the reading process, they are best taught in Spanish in the context of reading and writing (Escamilla, 2000).

Domain D: Comprehension Strategies (sufficient background information and vocabulary to foster reading comprehension)

Monolingual English Speakers

Reading comprehension requires the ability to comprehend decontextualized language, i.e., academic language (Durgunoglu, 1998; Lanauze and Snow, 1989). Decontextualized language, rather than fluent speech is a stronger predictor of literacy development (Snow, Cancini, Gonzalez and Shriberg, 1989). However, oral proficiency increases phonological awareness, and as such may indirectly affect decoding (e.g., word recognition, spelling, and passage comprehension) (Speese, Roth, Cooper, and de la Paz, 1999; Chaney, 1994; Metsala and Walley, 1998). Academic literacy development is assessed by evaluating the quality of formal definitions in oral and written language (Dickinson and Snow, 1987; Gathercole and Baddeley, 1989). In turn, vocabulary knowledge is affected by the amount of experiences with oral and written language as well as culture (Gathercole and Baddeley, 1989), by cognitive skills such as memory and categorization, and decoding proficiency through its impact upon integrative processes (Shankweiler, 1989; Stanovich, 1986). As spelling proficiency increases so does use of more sophisticated reading strategies (Ehri, 1998; Venezky, 1993). The amount of prior knowledge of a topic also affects how much one will comprehend a text on that topic (Dochy, Segers, and Buehl, 1999; Stahl and Jacobson, 1986; and Tobias, 1994).

Reading comprehension is also impacted by the use of different literacy methods. Explicit and non-explicit instruction emphasizes different reading and writing skills and components (Durgunoglu and Oney, 2000). The impact of literacy instruction upon reading skills is also greatly affected by the quality of literacy activities, nature of instructional grouping, classroom management styles, classroom atmosphere and parental participation (Pressley, Wharton, McDonald and Mistretta, 1998).

Monolingual Non-English Speakers

No direct reference was found among the commissioned papers.

Bilingual Speakers

The majority of literacy research to date has been conducted with bilingual adults, primarily college students. Findings from this work indicate that memory for a written passage is improved if it is first presented once in each language rather than twice in one language (Durgunoglu, 2000; Peynircioglu and Durgunoglu, 1993). This is again consistent with the work of Escamilla and brain research presented earlier. As with monolingual English speakers, reading comprehension among bilingual children increases as their familiarity with the topic increases (Dochy, Segers, and Buehl, 1999; Stahl and Jacobson, 1986; Tobias, 1994; García, 1991). Good meaning construction strategies facilitate improved literacy skills. Bilingual children develop metalinguistic awareness earlier than monolingual children (Bialystok, 1977). Bilingual children also realize the arbitrariness of symbols and the independence between form and meaning earlier than do monolinguals (Ben Zeev, 1977).

Special note must be taken for individuals who are less bilingual. For them, translating information from L2 to L1 is faster than translating from L1 to L2 (Kroll and Curley, 1988; Peynircioglu and Tekean, 1997). In novice bilinguals, lexical links between two languages are stronger than conceptual links, making it easier to access lexical links (Durgunoglu and Oney, 2000). This implies that, in the early stages of literacy development in a second language, one should rely upon the first language to maximize conceptual development. It is not surprising then that Durgunoglu and Oney (2000) found that word recognition in a second language develops faster when the concepts are first developed in the primary language.

Domain E: Family Literacy (e.g., parent/child interactive activities, early childhood education, adult literacy, and parent education)

Monolingual English Speakers, Monolingual Non-English Speakers and Bilingual Speakers

The cognitive components of literacy, i.e. foundation, develop within the context of family, peers, community, and culture (Durgunoglu and Oney, 2000; Bronfenbrenner, 1995). The home plays a critical role in the development of language skills, and through them literacy skills (Heath, 1983; Chaney, 1992, 1994, and 1998; Dickinson and Snow, 1987; Hart and Risley, 1995; Teale, 1986). Children's knowledge of rimes is correlated with their subsequent phonological awareness (Maclean, Bryant, and Bradley, 1987). As the knowledge of book titles is a good predictor of subsequent reading achievement, the availability of books at home and school is very important to supporting literacy development (Cunningham and Stanovich, 1998). Given that family income and mother's level of education are significant determinants of the availability of books and types of literacy activities in the home, it is even more important that schools serving traditionally underserved students have print rich classrooms and libraries (Baker, Fernández-Fein, Scher, and Williams, 1998). See also Söderbergh 2000 for small case studies on parents introducing literacy to children from a very early age.

Education Reform Effort at Level II (Early Elementary)
To teach every child to read by grade 3.

Domains A and B: *no direct reference was found among the commissioned papers.* See listing of recommendations and questions for further research.

Domain C: *The ability to read fluently*.

Monolingual English Speakers and Monolingual Non-English Speakers

No direct reference was found among the commissioned papers. See listing of recommendations and questions for further research.

Bilingual Speakers

Research has identified several factors influencing the ability to read fluently. As proficiency in L1 is essential to the successful development of English reading skills (Carter and Cantfield, 1986), literacy can be enhanced through the development of primary language speaking, reading, writing, and comprehension skills. Literacy development can also be improved if the reading content is sequenced with clear grade level expectations (Carter and Cantfield, 1986). Literacy development is also greatly facilitated when reading skills are taught in context, shared reading opportunities are provided, thematic curriculum is used, and when there are frequent reading-to-write and writing-to-read activities (Pease-Alvarez, García, and Espinosa, 1991; García, 1992; Barrera and Jiménez, 2000). Literature-based sheltered English instruction is a very successful literacy strategy with upper elementary students (Gersten, 1996; Gersten and Jiménez, 1994), especially if it is used within a whole language framework (Rutherford, 1999). However, the effectiveness of literacy instruction is mediated by several factors: balancing meaning and skill development; teacher values, beliefs, and attitudes towards second language learning and English Language Learners; cultural connections of content and pedagogy; strategic alternation of L1 and English in instruction; connecting home and school literacy experiences; integrating literacy into content instruction; encouraging students to make predictions and intertextual connections during reading tasks; providing hands-on-learning activities; using cooperative grouping; using realia for challenging text; and, providing writing activities to help students make sense of print literacy (Mulhern, 1987; Edelsky, 1986; Barrera and Jiménez, 2000). An effective teacher uses a range of strategies to assess literacy; providing students with alternative options, especially authentic tasks, for demonstrating what they have learned.

Education Reform Effort at Level III (Late Elementary)
To improve reading of expository text; reading to learn.

Domains A and B: See listing of recommendations and questions for further research.

Domain C: *The ability to read fluently.*

Monolingual English Speakers

While there is very limited research on the development of reading skills among late-elementary students, the work that is available finds many similarities between early and late elementary students. There is a strong relationship between knowledge of word meaning and ability to comprehend passages containing those words (Anderson and Nagy, 1992). Given the nature of the assessment tasks, it is not surprising that vocabulary knowledge is highly correlated with scores of general intelligence, standardized achievement tests, and school success (Dickinson, 1984). As an example, oral vocabulary production is highly correlated with English reading achievement (Saville-Troike, 1984).

Bilingual Speakers

Vocabulary development is essential for the development of reading skills among late-elementary students. Unknown vocabulary on tests is a critical linguistic factor adversely affecting reading test performance (Ammon, 1987). Consequently, it is not surprising to find that English Language Learners demonstrate a lower vocabulary and reading ability than monolingual English speakers (McLaughlin, et al., 2000; Umbel and Oller, 1994; Umbel, Pearson, Fernández, and Oller, 1992). Vocabulary delay among bilingual children reflects a lag in both the number and range of meaning aspects of words (Verhallen and Schoonen, 1993). English Language Learners rely more on their vocabulary knowledge than English-only students when reading text (McLaughlin, et al., 2000). There is evidence that vocabulary knowledge may be even more important for test performance among fifth- and sixth-grade Latino students than prior knowledge of content (García, 1991). As a result, non-native English speakers can significantly improve their vocabulary development and reading comprehension over time if they receive an enriched program of vocabulary instruction for two or more years (McLaughlin, et al., 2000). It is noteworthy that, in contrast to their early-elementary peers, late-elementary students have to learn to read in units larger than individual words (Gibson and Levin, 1975).

Given the importance of vocabulary knowledge, reading fluency among late-elementary students can be improved through the use of research-based activities that support vocabulary acquisition (Beck, McKeown, and Omanson, 1987).

Implications for Professional Development: Improving instructional practices of elementary teachers and other instructional staff.

Monolingual Non-English Speakers

Regarding the skills and knowledge to understand how phonemes or speech sounds are connected to print, research with monolingual Spanish-speaking elementary students finds that they are first taught vowel sounds in beginning reading. Then they are taught to combine these

vowel sounds with consonants to form syllables. The syllable is the building block in teaching children to begin to decode words in Spanish (Ferreira, Pallier, Rodríguez, Silva, and Vernon, 1994).

Bilingual Speakers

Regarding the ability to read fluently**,** Escamilla provides the most cogent and complete discussion of specific skills and knowledge that teachers must have if they are to successfully help bilingual students become proficient readers in English or in their primary language (Escamilla, 2000). Her research indicates that teachers will not be effective in teaching literacy to bilingual students until they understand how becoming literate in Spanish differs from becoming literate in English. The majority of teachers responsible for teaching children to read and write in Spanish have not been trained to teach these skills in Spanish (Gorier, 1997; Guerrero, 1997). In addition, teachers need to understand that language proficiency and concept development in bilinguals especially for young children- must include both L1 and L2 (Grosjean, 1989; Escamilla, 1998, 2000).

A collective holistic view of bilingualism must acknowledge that two languages produce a unique and specific speaker-hearer-writer (Grosjean, 1989). This has tremendous implications for teachers as they monitor the development of speaking, reading, writing, and comprehension skills in terms of the benchmarks and measures to be used to assess student progress. For example, teachers consider knowledge of two words to express the same concept in English and Spanish a problem, rather than a sign of cognitive enhancement (Diaz and Klinger, 1991; Escamilla, 1998). Escamilla (2000) is quite clear that such criteria and assessment protocols should ensure that the student is able to access and use both L1 and L2. She recommends that a quality literacy teacher-training program should provide teachers with a positive schema that would allow them to interpret and observe the development of two languages in bilingual children. "One cannot create a valid and reliable assessment of reading or writing tasks for bilingual children without considering and including the many ways that English and Spanish interact in the minds of young children who are simultaneously learning two languages" (Escamilla, 2000). Barrera and Jiménez (2000) exhort teacher-training programs to help teachers develop a range of strategies for assessing literacy development in L1 and L2, including authentic tasks, as well as helping teachers understand how the different educational approaches for teaching bilingual students complement one another.

Given the phonological, syntactic, and semantic differences between languages, it is critical that teachers be made aware that literacy strategies which are successful in helping monolingual English-speakers learn to read in English may not be the best strategies to use in teaching either monolingual non-English speakers or bilingual students to read in their first language or in English. As such, teachers need to be wary of using instructional materials to develop reading and writing in English that have been simply translated to develop literacy skills in another language, as they will not reflect the differences between the two languages (Escamilla and Coady, 2000).

Conclusion

The commissioned papers document the need for teachers to understand the nature of bilingualism, its development, and its implications for teaching, learning, and assessment. For example, the order in which phonological skills are explicitly taught may differ by language as a function of the unique characteristics of the orthography and syntax. While in beginning reading consonants are first taught in English, vowels should be first taught in Spanish. In addition, phonological and syntactic awareness in Spanish are best taught as an integral part of reading and writing. Teachers need greater understanding of how to use each of the child's languages to support academic learning, such as how to improve memory, when and how to translate, use of contrastive analyses to support reading and writing, and how to support literacy activities in the home. These research findings highlight the critical role of language development in guiding literacy content, instruction, and assessment. Education reform is intended to provide similar research-based guidance for literacy instruction.

To support the national reading reform initiatives, the Office of Bilingual Education and Minority Languages Affairs commissioned this set of papers to begin to draw together research on how best to support literacy development among one of the largest and fastest-growing sectors in our public schools: bilingual students. The intent of this synthesis is to organize the information from these papers pursuant to the goals, principles, and activities that serve as the research-based framework for the nation's major reading policy initiative, the Reading Excellence Act. This information would be used to guide professional development, instruction, curriculum development, and assessment in support of helping bilingual students to develop the highest possible literacy levels. While the commissioned papers do not represent a comprehensive review of the extant literature, they do represent a major seminal effort.

What have we learned?

The articles reviewed clearly document the need for teachers to understand the nature of bilingualism, its development, and its implications for teaching, learning, and assessment. For example, the order in which phonological skills are explicitly taught may differ by language as a function of the unique characteristics of the orthography and syntax. While in beginning reading consonants are first taught in English, vowels should be first taught in Spanish. In addition phonological and syntactic awareness in Spanish are best taught as an integral part reading and writing. Teachers need greater understanding of how to use each of the child's languages to support academic learning, such as how to improve memory, when and how to translate, use of contrastive analyses to support reading and writing, and how to support literacy activities in the home.

Support for students having reading difficulties.

The synthesis of the commissioned papers also revealed one area in which significant research on bilingual students is needed: providing additional support for students having difficulty making the transition from Kindergarten to grade 1. No information was provided in

the articles included in this review. The interaction of speaking, reading, writing, and comprehension development in the primary (minority) language with the development of these skills in a second (majority) language remains to be thoroughly understood. For example, Kindergarten often provides bilingual students with their first systematic and sustained efforts at developing oral language for academic learning. They are provided with opportunities to begin to associate sounds with print. The question arises, how much more challenging is this for a bilingual student who is trying to not only learn the sounds of a second language, but also associate these new sounds with print? How does the sound and print system of one language interact and impact the development of these skills in a second language? How should teaching and learning opportunities for these bilingual Kindergarten students be adjusted to facilitate their transition to the even more demanding literacy requirements of first grade?

Teaching every child to read in Early elementary.

One of the most significant contributions from bilingual research is documentation of student work and brain research helping to clarify and re-conceptualize our notion of what it means to be bilingual and the process of becoming bilingual. That is, that there is a common neural network in brain that localizes our language functions. Bilinguals are able to access either language in this common pool for the information that they need. The implications of Escamilla's work is a call for expanded efforts to more fully document the process of becoming bilingual, mapping the evolution, interactions, and refinements in each language over time, by age of initiating second language acquisition and context.   Such information is needed to guide teacher training, instruction, curriculum materials, program design and placement, and assessment.

Several factors also contribute to successful literacy programs for bilingual students. While an articulated reading framework with clear grade level content, student, and teacher performance standards is essential, such a framework in L1 and L2 literacy must also consider the role of the other language, especially in the process used to monitor growth over time.

Improving reading in Late Elementary.

Research in this area for bilingual students appears to be almost non-existent. The few studies that are available focus exclusively on the importance of providing students with enriched vocabulary instruction for two or more years as a major strategy for improving vocabulary knowledge, reading comprehension, and test performance. However, these studies did not take into account factors demonstrated to impact student literacy, e.g., student's proficiency in L1 or L2 or prior educational experience. Almost universally, student achievement tends to level off as they progress from grade 3 to grade 4. However, among bilingual students, achievement tends to decline. While one might surmise that this drop may reflect the increased use of decontextualized language, there is no research to fully explain this trend or to document possible intervention strategies.

Improving instructional practices of elementary teachers and other instructional staff.

One of the major findings regarding helping bilingual students become literate is that teachers need to understand how becoming literate in L1 differs from becoming literate in English; how the languages interact during development over time; and their implications for teaching, learning, and assessment. In more direct terms, a successful literacy program for bilingual students must be built upon a thorough grounding in language development for L1 and L2. Teachers also need to balance: meaning and skills; their values, beliefs, and behaviors towards first and second language acquisition and English language learners; cultural relevance of content and pedagogy; strategic balancing of L1 and English instruction; and the teacher/parent relationship.

What do we still need to know and do?

Areas in Need of Research

Overall, there is a need to rapidly expand literacy research focused on bilingual students in each of the objectives, key principles, and activities of the REA. A review of Table 1 notes several general areas for which research on bilingual students is needed:

1. Key language and literacy developmental characteristics of children becoming bilingual and biliterate in early childhood.
2. The ability to decode unfamiliar words.
3. How to develop sufficient background information and vocabulary to foster reading comprehension among early childhood and elementary students.
4. The ability and maintenance of a motivation to read.
5. Professional development models and content.
6. Out-of-school tutoring.
7. Transition programs for Kindergarten students.
8. Curriculum and supportive materials.
9. Reading and library programs that provide access to engaging reading materials and coordination of local reading, library, and literacy programs.
10. Family literacy: interactive activities between parents and their children; parent training on how to be the primary teacher for their children and full partners in the education of their children; parent literacy training that leads to economic self-sufficiency among other benefits.
11. Research on literacy development among bilingual students, especially those who are older learners.
12. Technology that can be used to support literacy development among bilingual students.
13. The development of reading comprehension among English Language Learners.
14. Assessment of the impact of different language programs on the representation of language in the brain through different neuroimaging processes.
15. Mapping the development of bilinguality (speaking and reading) in children through different neuroimaging processes to identify the neural processes that must occur for a child to become proficient in more than one language, and to develop the language and literacy skills in a non-native second language.

Research Questions Needing Answers

        The following lists a number of important questions surrounding literacy development in L1 and L2 that would help inform teachers as to how they might improve reading instruction for bilingual students:

- How does initial exposure to literacy in L2 affect the subsequent development of L2 literacy skills?

- How does literacy instruction in L2 affect the growth of literacy in L2 and the cognitive processes in bilingual literacy?

- What is the nature of cross-language transfer in literacy, especially on cognitive processes of reading and writing?

- How do listening skills develop among second language learners and support reading acquisition? How does the development of primary language listening skills influence the development of second language listening skills and reading acquisition?

- How does knowledge of a particular language and writing system influence bilingual literacy development?

- There are few studies on young children who are bilingual and beginning to develop literacy in one or both languages, and none documenting the development of bilingualism over time.

- What level of listening comprehension in L2 is needed for starting literacy instruction in L2?

- What roles do L1 and L2 oral proficiency have in the development of literacy in L2?

- What role does oral proficiency have in learning the actual patterns of a language?

- Are bilingual children better able to detect syntactic rules of languages than their monolingual peers?

- To what extent is the development of vocabulary knowledge a predictor of reading comprehension?

- To what extent can writing rubrics and other assessments developed for English speakers be used in Spanish?

- Is it appropriate to weight content and conventions in assessing writing proficiency in Spanish, in other non-English languages?

- To what extent is the development of Spanish (and other non-English languages) and English writing skills parallel?

- What early reading experience(s), formal and informal, supports bilingualism and promotes the development of language among children with disabilities?

- What models, examples, and tools enable teachers to create exemplary biliterate learning environments for the children they teach?

- What are the features of a culturally responsive, community-based literacy curriculum aligned with current reading/language arts standards?

- How do Latino children respond, cognitively and affectively, to culturally specific/authentic children's literature in English and Spanish?

- How effectively and efficiently do Latino students process new vocabulary in texts reflecting culturally-familiar content vs. texts with culturally-unfamiliar content?

- How effectively and efficiently would Latino students become literate in L1 and L2 if instruction sought to co-develop reading and writing ability?

- What influence do orthographic features in L1 have on students' writing and spelling development in L2?

- What role should phonics play in beginning reading in Spanish? And, how does this compare to the role of phonics in developing English reading and writing?

- What are key language and literacy developmental characteristics of children becoming bilingual and biliterate in early childhood?

- What does an assessment approach sensitive to simultaneous development in two languages and two modes (oracy and literacy) look like?

- How do Latino parents from different ethno-linguistic and socioeconomic groups support their children's emergent literacy (reading and writing in Spanish and English) during the preschool years?

- How do Latino parents from different ethno-linguistic and socioeconomic groups mediate instructional tasks, specifically homework, that requires literacy beyond their own cultural and academic experience?

- What neuro processes occur when children become proficient in more than one language?

- How can neuroimaging mapping be used to develop language literacy skills in non-native second language?

From the articles reviewed, research on how best to help bilingual students become literate is relatively nascent, and needs to be seriously expanded. It is also clear that this research must necessarily focus on both L1 and L2 in the research design, with specific attention to their interaction over time. While Escamilla notes how bilingual students will use both languages as needed, her work does not provide sufficient data on how this pattern of language use changes over time as the student's proficiency increases. Answers to the questions and issues listed above not only would guide the design, implementation, and evaluation of language programs, but they would also help to contextualize biliteracy development within the current national literacy initiatives.

In sum, bilingualism is an opportunity, not an obstacle to literacy. Bilingualism not only does not appear to be an obstacle to literacy development in either language, but also seems to provide the learner with heightened skills necessary for literacy. Instruction and content which fail to fully consider the role of language development, especially bilingualism, or the relevance of learning activities and materials to the lived experiences of the learner, at this point, seem to be the major obstacles to literacy development among bilingual students. Given the critical role of language proficiency to literacy development, it follows that successful literacy programs for bilingual students are more likely to occur within the context of a strong language development program.

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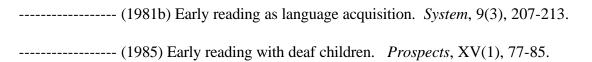
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