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The Development of Reading in Children Who Speak English as a Second Language

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Patterns of reading development were examined in native English-speaking (L1) children and children who spoke English as a second language (ESL). Participants were 978 (790 L1 speakers and 188 ESL speakers) Grade 2 children involved in a longitudinal study that began in kindergarten. In kindergarten and Grade 2, participants completed standardized and experimental measures including reading, spelling, phonological processing, and memory. All children received phonological awareness instruction in kindergarten and phonics instruction in Grade 1. By the end of Grade 2, the ESL speakers' reading skills were comparable to those of L1 speakers, and ESL speakers even outperformed L1 speakers on several measures. The findings demonstrate that a model of early identification and intervention for children at risk is beneficial for ESL speakers and also suggest that the effects of bilingualism on the acquisition of early reading skills are not negative and may be positive.

Although a great deal is known about the prereading skills necessary for early reading acquisition in English, the question remains as to whether the same patterns exist for children learning English as a second language (ESL). Phonological processing, syntactic awareness, and working memory are the cognitive processes that are assumed to be significant in the development of reading skills in English (for a review, see Siegel, 1993). Little is known about the development of phonological skills or other important precursors of reading for children with ESL backgrounds. It is important to understand whether such children's different linguistic backgrounds influence the process of learning to read English. Specifically, the extent to which the lack of fluency in the language of instruction has an impact on reading acquisition for the ESL-speaking child compared with the child whose native language is English (L1) is unknown. Bilingualism can be viewed as an impediment to or a facilitator of the development of reading skills in a second language (L2; Cummins, 1991). Previous research has suggested that variables such as program type, method of instruction, characteristics of the native language, and socioeconomic status (SES) of the bilingual learner may have an impact on L2 oral and literacy proficiency (August & Hakuta, 1997; Fitzgerald, 1995; Hakuta, 1999; Tabors & Snow, 2001). The present study is an investigation of the development of reading in a program designed for children who enter kindergarten with little or no proficiency in the language of instruction. Teaching children to read in a language in which they are not yet proficient has been identified as an additional risk factor for reading problems (Snow, Burns, & Griffin, 1998). For this group of children, it is critical to examine the development of reading and to examine those skills that are predictors of reading development in kindergarten. The focus in the present study is on those ESL-speaking children who are immersed in mainstream English classrooms in kindergarten.

Phonological awareness is a powerful predictor of the speed and efficiency of reading acquisition (Share, Jorm, Maclean, & Matthews, 1984). Research that has focused on the cross-language transfer of phonological awareness from the native language to the second language indicates that phonological awareness skill transfers from the first to the second language (e.g., Chiappe & Siegel, 1999; Cisero & Royer, 1995; Durgunoglu, Nagy, & Hancin-Bhatt, 1993). In studies examining native Spanish-speaking children who were beginning readers in English, Durgunoglu et al. (1993) found that Spanish word recognition and Spanish phonological awareness were better predictors of performance on English pseudoword and word reading tests than were English and Spanish oral proficiency and English word recognition, and Cisero and Royer (1995) found that accuracy on phoneme detection in Spanish was a significant predictor of performance on a similar task in English. Taken together, the results of these studies demonstrate that cross-language transfer of phonological awareness may take place even if phonological skills are still under development.

Like phonological awareness, syntactic awareness is a skill that is related to beginning reading achievement. The ability to process syntax has been identified as an important component of word

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learning (Ehri & Wilce, 1980). Several studies have reported difficulties with syntactic awareness in individuals with a reading disability (Siegel & Ryan, 1988; Willows & Ryan, 1986). Previous studies have shown a deficit in syntactic awareness skills among ESL-speaking average and disabled readers compared with their native English-speaking peers (e.g., da Fontoura & Siegel, 1995; Geva, Yaghoub-Zadeh, & Schuster, 2000).

Working memory may also be important for success in reading. Some research has focused on the relationship between working memory processes and reading ability. Several studies have found that reading-disabled individuals, compared with average readers, have difficulty with working memory throughout childhood, adolescence, and adulthood (e.g., Chiappe, Hasher, & Siegel, 2000; McDougall, Hulme, Ellis, & Monk, 1994; Siegel, 1994; Siegel & Ryan, 1989). Recent research has examined working memory and second-language reading acquisition. Geva and Siegel (2000) reported that verbal memory was a significant predictor of basic reading skills in both English and Hebrew in a sample of English speakers receiving instruction in Hebrew. Consistent with the findings for L1 average and disabled readers, da Fontoura and Siegel (1995) reported that those Portuguese Canadian children classified as reading disabled in English showed significantly poorer performance on tasks of working memory in both English and Portuguese than did average readers. The deficits in working memory for reading-disabled children suggest a generalized difficulty with working memory for children with reading disabilities regardless of language background.

There is evidence that certain metalinguistic and cognitive concepts emerge differently in bilingual children than they do in monolingual children (e.g., Bialystok, 1997; Bialystok & Hakuta, 1999; Campbell & Sais, 1995). Campbell and Sais (1995) reported accelerated phonological awareness ability in a sample of bilingual kindergarten children who were exposed to a second language during their preschool years. It has also been reported that young bilingual children may have an advantage in their general understanding of the symbolic function of written language as well as in their understanding of the way in which writing systems encode the spoken word (Bialystok, 1997). The results of these studies indicate that when a child is exposed to two languages, this bilingualism facilitates the acquisition of language-related skills such as reading and writing.

There is a tendency within schools to overlook or delay addressing the possibility that ESL-speaking children are having difficulties with word decoding or language processing that are typical of reading disability (Limbos & Geva, 2001). Oral language proficiency is often implicated as the main cause of the difficulties, and educational difficulties may be seen as part of the acculturation process (Limbos & Geva, 2001). A few studies have examined those skills that are predictors of reading performance in ESL speakers; the results have suggested that phonological awareness skills are better predictors of reading performance than are oral proficiency skills (e.g., Durgunoglu et al., 1993; Geva et al., 2000). Lack of oral language proficiency in the language of instruction is often the cause of underassessment of a child's reading ability in the second language that the child is acquiring (e.g., Limbos & Geva, 2001; Moll & Diaz, 1985). It is important to continue to examine the role of phonological awareness as a predictor of reading development in ESL-speaking children given that it may be a stronger, better predictor of reading performance than is oral language proficiency.

Those few studies that have been conducted to examine the reading and spelling development of children who receive classroom instruction in a language other than the language they speak in the home suggest that the reading developmental trajectories of such children are very similar to those of native speakers across different languages. For example, Chiappe and Siegel (1999) examined the performance of Punjabi-speaking (ESL) children and native English-speaking (L1) children in Grade 1. These authors reported that although measures of word recognition and phonological processing successfully discriminated between Grade 1 average and disabled readers, word recognition skills and phonological processing skills were not significantly different across the two language groups. The ESL children had skills in phonological awareness and reading comparable to those of their native English-speaking peers despite having lower scores on a measure of oral language that tapped syntactic awareness skills. Geva et al. (2000) found that in a large sample of ESL-speaking children and native English-speaking children, the ESL speakers performed significantly more poorly on a measure of oral proficiency; however, the groups did not differ in word recognition skills. The profiles of the not-at-risk ESL-speaking children were very similar to those of the not-at-risk native English speakers. The same patterns were observed in the at-risk children; performance on measures of phonological processing and rapid naming was low in all children with word recognition difficulty. Similar findings have been reported in research that has focused on languages other than English (e.g., Verhoeven, 1990). After 20 months of literacy instruction, Turkish speakers learning to read Dutch showed performance on a measure of word reading efficiency in Dutch that was not statistically different from that of native Dutch speakers (Verhoeven, 1990). However, the Turkish speakers remained significantly lower in reading comprehension than their Dutch peers (Verhoeven, 1990). Previous research has also demonstrated that even if differences in the orthographic complexity of the child's first and second languages exist, emergent spelling patterns in both of the child's languages are similar and spelling performance is more highly correlated with reading skills than with first-language characteristics (e.g., Geva, Wade-Woolley, & Shany, 1993; Wade-Woolley & Siegel, 1997). The results of these recent studies suggest a link between phonological processing difficulties and reading difficulties and also suggest that for ESL speakers, spelling ability is related to reading ability in the target language.

Although evidence has converged to support a model of early reading instruction that focuses on prevention and intervention for kindergarten children at risk for reading failure in the context of a balanced approach to literacy instruction for children whose first language is English (Lyon et al., 2001), little is known about effective instruction for ESL children and the long-term consequences of that instruction. Explicit and intensive teaching are two elements of classroom instruction that have been identified as vital to a model of early reading designed to promote reading success for all children (Foorman & Torgesen, 2001). Explicit skills instruction and systematic student assessment are two school procedures that have also been suggested as necessary for classroom settings that include language-minority children (August & Hakuta, 1997; Hakuta, 1999). The research conducted for the present study took place in a school district committed to identi-

fication of and intervention for kindergarten children at risk for reading failure. Systematic student assessment of prereading skills and explicit instruction in phonological awareness are part of the kindergarten program. In Grade 1, systematic phonics instruction takes place as part of the early reading curriculum. As a result, this study provides a unique opportunity to examine the development of reading and the kindergarten predictors of subsequent reading ability in the context of a school district committed to a model of prereading and reading instruction that is consistent with the current research on effective early reading programs for children with English as a first language (e.g., Lyon et al., 2001).

The patterns of reading development of ESL-speaking and L1-speaking children from kindergarten to Grade 2 who were receiving classroom instruction in English were examined. Measures of reading, spelling, language, and memory skills were administered to a large cohort of children from linguistically diverse backgrounds in order to gain further insight into whether similar patterns exist in ESL- and L1-speaking children who are experiencing reading failure and into the overall development of early reading in children who are ESL speakers. As well, the longitudinal nature of the study afforded an opportunity to examine those skills in kindergarten that are predictors of later reading ability for ESL-speaking children. Arithmetic was included as a measure in order to examine possible effects of language-group differences on nonverbal tasks compared with literacy tasks. This study also provided an opportunity to explore the potential benefits of bilingualism for reading acquisition.

Method

Design

All children were tested in the fall of their kindergarten year and classified as at risk for reading failure or not at risk on the basis of their performance on the Reading subtest of the Wide Range Achievement Test 3 (WRAT3; Wilkinson, 1993). Children in kindergarten were classified as at risk for reading failure if their performance on the WRAT3 Reading subtest was at or below the 25th percentile and as not at risk if their performance was at or above the 30th percentile. Two hundred ninety-six children (236 L1 speakers and 60 ESL-speaking children) scored at or below the 25th percentile on the WRAT3 Reading subtest and thus were classified as at risk for reading failure. Eight hundred sixty-six (766 L1 speakers and 100 ESL-speaking children) scored at or above the 30th percentile on the WRAT3 Reading subtest and thus were classified as not at risk for reading failure.

Children were tested again in the spring of their Grade 2 year and classified as average readers or as reading disabled on the basis of their performance on the Reading subtest of the WRAT3. In Grade 2, 40 children (33 L1 speakers and 7 ESL-speaking children) scored at or below the 25th percentile and were classified as reading disabled. Nine hundred thirty-eight children (757 L1 speakers and 181 ESL-speaking children) scored at or above the 30th percentile and thus were classified as average readers.

Participants

The children were part of a longitudinal study that began in their kindergarten year. They represented all of the children from all of the 30 schools in one Canadian school district. Within the full kindergarten sample, there were 1,040 L1 speakers and 197 ESL speakers. In Grade 2, owing to attrition, the full sample included 790 L1 speakers and 188 ESL speakers. Children were classified as ESL in kindergarten if they spoke a language other than English at home to their parents, siblings, and grandparents. This information was obtained through school records. Most of the ESL speakers were immigrants to Canada, although some had been born in Canada. In the elementary schools in this school district, children with ESL backgrounds receive the same early classroom instruction in English as their non-ESL peers. Most ESL children who are born in Canada or who arrive from their native countries as young children begin the same schooling in mainstream English classrooms at the same time as their non-ESL peers despite their limited oral proficiency in English. Given that the sample included the whole school district of a Canadian city, the sample represented a wide range of SES backgrounds. Since the majority of the sample ($n = 790$) were native English speakers, the L1 children represented a wide SES range. In order to examine the demographic distribution of the ESL children, an indicator of SES for each school region in the district was taken from a national database. This SES indicator is based on average income and other income-related measures (e.g., real estate value) for all people in each of the school regions. The relationship between SES and ESL status was examined for each of the 30 schools. The correlation between ESL status and the SES indicator was not significant, $r(30) < .03$ (Statistics Canada, 1996). This lack of a significant correlation reduces the possibility that the performance of the ESL children was confounded, as a group, by SES. The ESL children came from a variety of linguistic backgrounds; the sample spoke a total of 33 different languages. For the ESL children, the predominant native languages were Cantonese, Mandarin, Korean, Spanish, Persian, Polish, and Farsi. The school district to which the children belonged places an emphasis on ESL instruction for children in the higher elementary grades (i.e., Grades 4, 5, and 6). Therefore, none of the ESL children were yet receiving ESL instruction, and they could not read in their native languages when they entered kindergarten.

Of the 1,162 children in the kindergarten sample, there were 608 girls and 554 boys. The mean age of the kindergarten sample was 64.39 months ($SD = 3.45$ months). In the Grade 2 sample, there were 469 girls and 509 boys. The mean age of the Grade 2 sample was 93.72 months ($SD = 3.66$ months).

Kindergarten Measures

Literacy

WRAT3 (Wilkinson, 1993). The WRAT3 Reading subtest (blue form) was used. Each child was asked to name capital letters and to read some simple words.

Letter identification. Each child was asked to name lowercase letters from a page of 26 letters presented in a random order.

Phonological Processing

Sound mimicry. The children's skill at recognizing and reproducing sounds in oral language was assessed with the Sound Mimicry subtest of the Goldman-Fristoe-Woodcock Auditory Skills Test Battery (Goldman, Fristoe, & Woodcock, 1974). In this task, children repeated pseudowords of increasing difficulty that were read to them by the examiner (e.g., *ab, dod, bafmotbem*).

Rhyme detection. The rhyme detection task from the Phonological Abilities Test (Muter, Hulme, & Snowling, 1997) was used. In this task, the children were shown four pictures. A picture of the target word appeared above three pictures. Children were asked which of the three words rhymed with the target word.

Phoneme deletion. The phoneme deletion task from the Phonological Abilities Test (Muter et al., 1997) was used. For this task, the examiner would present the child with a picture of the word and then ask him or her to delete a phoneme (initial or final) from the word.

Syllable identification and phoneme identification. In these tasks from the Phonological Abilities Test (Muter et al., 1997), children were required to complete words. In the syllable identification task, the examiner pre-

sented a picture (e.g., a rabbit) to the child. The examiner said the first part of the word (i.e., "ra") and asked the child to finish the word (i.e., "bit"). In the phoneme identification task, the examiner presented a picture (e.g., a watch). The examiner said the first part of the word (i.e., "wa") and asked the child to finish the word (i.e., "tch").

Lexical Access

Phonological recoding in lexical access, or word retrieval, was assessed using a variation of the Rapid Automatized Naming task (RAN; Denckla & Rudel, 1976). In this task, the child named 40 items on a page that contained line drawings of 5 different items (*tree, chair, bird, pear,* and *car*) repeated 8 times. To ensure that all children knew the target words, we presented a practice page of the 5 items immediately before the presentation of the 40 items. The score was the time taken (number of seconds) to name the 40 items.

Syntactic Awareness

Syntactic awareness was assessed using an oral cloze task (Siegel & Ryan, 1989; Willows & Ryan, 1986). In the oral cloze task, 12 sentences with missing words were read to the child, and the child attempted to provide the missing word in each sentence. An example sentence from this task is "The moon shines bright in the ____."

Memory

The Stanford Binet Intelligence Scale (Thorndike, Hagen, & Sattler, 1986) Memory for Sentences subtest was used to assess memory. In this subtest, the child is asked to repeat sentences ranging from simple two-word sentences to more complex sentences.

Spelling

In order to examine children's spelling ability in kindergarten, we asked them to print their names and five simple words (i.e., *mom, no, I, cat,* and *dad*).

Grade 2 Measures

Reading

WRAT3 (Wilkinson, 1993). The WRAT3 Reading subtest (blue form) was used. This test involves reading from a list of words of increasing difficulty. Each child was required to read as many words as possible from the list. The task administration was discontinued when 10 consecutive words were read incorrectly.

Woodcock Reading Mastery Tests—Revised, Form G (WRMT–R; Woodcock, 1987) Word Identification subtest. The Word Identification subtest of the WRMT–R consists of a word-reading list of increasing difficulty. Each child was required to read as many words as possible from the list. The task administration was discontinued when all items in a given level were failed.

WRMT–R, Form G (Woodcock, 1987) Word Attack subtest. This subtest, which measures decoding skills, consists of a list of pseudowords of increasing difficulty. The child was required to decode as many words as possible from the list. The task administration was discontinued when all items in a given level were failed.

Stanford Diagnostic Reading Test (SDRT; Karlsen & Gardner, 1994) Reading Comprehension subtest. This subtest was administered to groups of children in each of the Grade 2 classrooms. Each child received a booklet and was required to read the short passages within the booklet and provide responses to multiple-choice questions in a prescribed time limit.

One-minute word reading (WRAT3 Reading subtest, tan form; Wilkinson, 1993). In this task, the child was presented with a list of real words of increasing difficulty and was asked to read as many words as possible within a 1-min time period. The WRAT3 Reading subtest (tan form) was used as a word list in order to obtain a fluency measure; the number of words read correctly determined the score for this task. Standardized norms are not available when the WRAT3 is used as a timed task.

One-minute pseudoword reading (WRMT–R Word Attack subtest, Form H; Woodcock, 1987). In this task, the child was presented with a list of pseudowords and asked to read as many as possible within a 1-min time period. The WRMT–R Word Attack subtest (Form H) was used as a word list in order to obtain a fluency measure; the number of words read correctly determined the score for this task. Standardized norms are not available when this subtest is used as a timed task.

Memory

Working memory for words (Siegel & Ryan, 1989). The child was presented with sets of sentences missing the final word that were read aloud by the examiner. The child was required to provide the missing word for each sentence and then repeat all the missing words from each set of sentences. There were three trials within each set of sentences. The number of sentences in each set increased, beginning with 2 sentences and increasing by an additional sentence, up to a possible 5 sentences (2, 3, 4, and 5). Word-finding problems were minimized by using sentences in which the missing words were virtually predetermined. The children did not experience any difficulty in supplying the missing words. An example of a sentence is "Snow is white, grass is _____." The task administration was discontinued when the child failed all the items in a given level.

Working memory for numbers (Siegel & Ryan, 1989). This task involved counting yellow dots within a field of blue and yellow dots arranged in a randomly determined irregular pattern on a 5×8 in. index card. For each set, the child was asked to recall the number of yellow dots on each card in the order they were presented. There were three trials within each set of cards. The number of cards in each set increased, beginning with 2 cards and increasing by an additional card up to a possible 5 cards (2, 3, 4, and 5). The task administration was discontinued when the child failed all the items of a given set.

Phonological Processing

Rosner's Auditory Analysis Test (Rosner & Simon, 1971) includes both syllable and phoneme deletion. The child was asked to say a word and was then asked to say the word again without one of its sounds (e.g., "Say smell." "Now say smell without the /m/ sound."). Two practice items and 40 test items were administered. Participants were asked to delete syllables, single phonemes from both the initial and final positions in each word, and single phonemes from blends. The 40 items were arranged in order of difficulty, and administration of the test items was discontinued after 5 consecutive error responses.

Lexical Access

The RAN task (Denckla & Rudel, 1976) was used to test the efficiency of lexical retrieval. In this task, children were required to name individual numbers (1–9) presented in a random order with 5 rows and 5 columns. The child's performance was timed in seconds.

Syntactic Awareness

Syntactic awareness was assessed with an oral cloze task (Siegel & Ryan, 1989; Willows & Ryan, 1986). In the oral cloze task, 12 sentences

with missing words were read to the child, and the child was required to provide the missing word in each sentence. An example of this task includes "The moon shines bright in the ____."

Spelling

WRAT3 Spelling subtest (Wilkinson, 1993). This subtest is made up of orally presented words of increasing difficulty, and the child was required to generate the correct spelling for them.

Real word spelling. A word spelling task was administered by dictation. The child had to generate the correct spelling for 10 different words. Sample words are *love* and *toy.*

Nonword spelling. A nonword spelling task was administered by dictation. The child had to generate plausible letter representations of the nonwords. Ten different nonwords were presented. Sample nonwords are *ged* and *tave* (pronounced to rhyme with *wave*).

Arithmetic

The WRAT3 (Wilkinson, 1993) Arithmetic subtest (blue form) consists of a page of computational written mathematics problems, and the child was required to solve them to the best of his or her ability.

Districtwide Reading Program

The school district to which the children belonged is one that has made a commitment to a balanced reading acquisition program that includes phonological awareness instruction. Following the kindergarten assessment, each school received feedback on the performance of the children who participated in the study. Specifically, those children who were classified as at risk for reading failure were identified within the feedback. The phonological awareness training took the form of classroom-based, small-group activities for all children in kindergarten. The small groups consisted of both ESL and L1 speakers matched on phonological awareness ability. The classroom teachers as well as the school resource teachers provided the intervention 3 to 4 times a week for 20 min. The kindergarten phonological awareness training for all children was presented in the context of a variety of literacy activities, which included a combination of activities with an explicit emphasis on the sound–symbol relationship as well as independent activities such as cooperative story writing and journal writing using invented spelling. Given the commitment of the district to early identification and intervention for children at risk for reading failure, the phonological awareness intervention continued into Grade 1 for some children in the study and took the form of small-group and individually targeted interventions.

Procedure

Trained graduate students conducted individual assessments in the schools. Each child was assessed individually in a quiet room. The spelling, reading comprehension, and arithmetic tasks were administered in a group setting in the classrooms. Some children were not administered every task because of absence from the classroom on the day of testing.

Results

Language Groups (ESL vs. L1 Speakers)

Table 1 summarizes the performance of the two language groups on the kindergarten tasks. A 2 × 2 analysis of variance (ANOVA) demonstrated no significant differences between the ESL and L1 children on the WRAT3 Reading subtest, $F(1, 1091) = 2.25$, *ns*, or on the letter identification task, $F(1, 1091) = 2.01$, *ns*. The ESL children performed significantly more poorly than the L1 children on the sound mimicry, $F(1, 1091) = 7.34$, $p < .01$, rhyme detection, $F(1, 1091) = 41.96$, $p < .01$, oral cloze, $F(1, 1091) = 21.13$, $p < .01$, memory for sentences, $F(1, 1091) = 68.79$, $p < .01$, rapid naming, $F(1, 1091) = 31.93$, $p < .01$, and simple spelling, $F(1, 1091) = 8.97$, $p < .01$, tasks. There were no significant differences between the language groups on the measures of syllable identification, $F(1, 1091) = 1.98$, *ns*, phoneme identification, $F(1, 1091) = 0.07$, *ns*, and phoneme deletion, $F(1, 1091) = 2.32$, *ns*. There were no significant interactions of language with risk group on any of the kindergarten tasks.

Table 2 summarizes the overall performance of the language groups on the Grade 2 tasks. The results of a 2 × 2 ANOVA revealed no significant differences between the ESL and L1 children on the WRAT3 Reading subtest, $F(1, 875) = 2.14$, *ns*, the WRMT–R Word Attack subtest, $F(1, 875) = 2.01$, *ns*, the SDRT Reading Comprehension subtest, $F(1, 875) = 0.70$, *ns*, the Rosner Auditory Analysis Test, $F(1, 875) = 2.05$, *ns*, or the working memory for words, $F(1, 875) = 0.13$, *ns*, and the working memory for numbers, $F(1, 875) = 0.04$, *ns*, tasks. As a group, the ESL children performed significantly better than the L1 children on the WRMT–R Word Identification subtest, $F(1, 875) = 4.16$, $p < .05$, the one-minute word reading task, $F(1, 875) = 13.01$, $p < .01$, and the one-minute pseudoword reading task, $F(1, 875) = 8.95$, $p <$

Table 1
Overall Results by Language Group in Kindergarten

Measure	English (n = 1,040)	ESL (n = 197)	F	p
WRAT3 percentile	55.33	51.45	2.25	*ns*
Letter identification	15.51	14.54	2.01	*ns*
Sound mimicry	80.90	75.80	7.34	< .01
Rhyme detection	6.95	5.19	41.96	< .01
Oral cloze	2.39	1.30	21.13	< .01
Memory for sentences	16.82	14.08	68.79	< .01
Rapid naming	68.39	79.87	31.93	< .01
Syllable identification	4.73	4.42	1.98	*ns*
Phoneme identification	2.82	2.75	0.07	*ns*
Phoneme deletion	3.56	2.95	2.32	*ns*
Simple spelling	2.62	2.14	8.97	< .01

Note. ESL = English as a second language; WRAT3 = Wide Range Achievement Test 3, Reading subtest.

Table 2
Grade 2 Performance of ESL and L1 Children

Measure	English (n = 790)	ESL (n = 188)	F	p
WRAT3 Reading percentile	69.00	71.96	2.14	*ns*
WRMT–R Word Identification percentile	71.58	76.11	4.16	< .05
WRMT–R Word Attack percentile	70.71	73.55	2.01	*ns*
SDRT Reading Comprehension percentile	53.68	51.98	0.70	*ns*
One-minute word reading	21.80	23.60	13.01	< .01
One-minute nonword reading	23.05	25.41	8.95	< .01
Oral cloze	7.50	6.75	24.23	< .01
Rosner AAT	21.49	22.23	2.05	*ns*
Rapid naming	13.02	12.45	4.82	< .05
Working memory for numbers	6.18	6.14	0.04	*ns*
Working memory for words	3.47	3.42	0.13	*ns*
WRAT3 Arithmetic	51.69	58.52	12.36	< .01
WRAT3 Spelling	59.25	66.59	13.72	< .01
Real word spelling	8.65	9.14	12.19	< .01
Nonword spelling	8.20	8.84	12.12	< .01

Note. ESL = English as a second language; L1 = English as native language; WRAT3 = Wide Range Achievement Test 3; WRMT–R = Woodcock Reading Mastery Tests—Revised; SDRT = Stanford Diagnostic Reading Test; AAT = Auditory Analysis Test.

.01. On all three measures of spelling, the ESL children performed significantly better than the L1 children: WRAT3 Spelling subtest, $F(1, 875) = 13.72$, $p < .01$; real word spelling, $F(1, 875) = 12.19$, $p < .01$; and nonword spelling, $F(1, 875) = 12.12$, $p < .01$. In contrast, the ESL children performed significantly more poorly than the L1 children on the oral cloze task, $F(1, 875) = 24.23$, $p < .01$. There were no significant interactions of language with reader group on any of the Grade 2 tasks. When WRAT3 Arithmetic subtest performance, a measure that does not involve language, was covaried out, the findings between the two language groups did not change. In both ESL and L1 samples, there was a normal distribution of the data.

Kindergarten Results

In order to make group comparisons between ESL and L1 speakers, and between at-risk and not-at-risk children, we conducted a series of 2 × 2 ANOVAs. The ANOVAs examined within-subject factors (measures administered) and between-subjects factors (language status: ESL or L1; risk status: not at risk or at risk). A significant main effect ($p < .01$) for language group on performance on the battery of kindergarten tasks was detected (effect sizes across measures ranged from .000 to .059). A significant main effect for classification in kindergarten ($p < .01$) was detected (effect sizes across measures ranged from .008 to .577). Language status and classification did not interact to create a significant effect for kindergarten performance (effect sizes across measures ranged from .000 to .007).

Literacy Measures

Table 3 summarizes the children's performance on the early literacy measures in kindergarten. The ESL not-at-risk group's performance on the WRAT3 Reading subtest was significantly higher than that of the L1 not-at-risk group, $F(1, 870) = 4.69$, $p < .05$. In contrast, the ESL not-at-risk group performed significantly

Table 3
Kindergarten Mean Scores on Measures of Early Literacy

	Not at risk		At risk	
Measure	L1 (n = 766)	ESL (n = 100)	L1 (n = 236)	ESL (n = 60)
WRAT3 Reading percentile				
M	68.18	72.28	12.85	10.50
SD	18.02	18.58	7.19	7.25
Letter identification (maximum = 26)				
M	18.34	19.99	6.25	4.67
SD	5.67	5.88	4.70	4.75
Spelling (maximum = 6)				
M	3.05	2.72	1.18	0.96
SD	1.81	1.87	0.98	0.87

Note. L1 = English as native language; ESL = English as a second language; WRAT3 = Wide Range Achievement Test 3.

more poorly than the L1 not-at-risk group on the letter identification task, $F(1, 867) = 7.73$, $p < .01$. There were no significant differences between the ESL and L1 not-at-risk groups on the simple spelling measure, $F(1, 839) = 2.81$, *ns*. The pattern of results for the at-risk readers on the WRAT3 Reading subtest was different from the pattern for the not-at-risk readers; the performance of the L1 at-risk readers was significantly higher than that of the at-risk ESL speakers, $F(1, 293) = 5.11$, $p < .05$. In a pattern similar to that shown by the two not-at-risk groups, the ESL at-risk group performed significantly more poorly than the L1 at-risk group on the letter identification task, $F(1, 293) = 5.23$, $p < .05$, and there were no significant differences between the ESL and L1 not-at-risk groups on the simple spelling measure, $F(1, 288) = 2.37$, *ns.*

The patterns of results on literacy measures for the ESL and L1 speakers were similar. Within the two language groups, there were significant differences between the at-risk and not-at-risk groups on all literacy measures. By definition, the ESL and L1 at-risk groups performed significantly more poorly than the ESL and L1 not-at-risk groups, respectively, on the WRAT3 Reading subtest [ESL, $F(1, 140) = 486.82$, $p < .01$; L1, $F(1, 929) = 2{,}012.69$, $p < .01$]. The ESL and L1 not-at-risk groups had higher scores than the at-risk groups on the letter identification [ESL, $F(1, 140) = 239.63$, $p < .01$; L1, $F(1, 929) = 856.32$, $p < .01$] and simple spelling [ESL, $F(1, 140) = 42.44$, $p < .01$; L1, $F(1, 929) = 225.56$, $p < .01$] tasks.

Phonological Processing Measures

Table 4 summarizes the results for the kindergarten measures of phonological processing. Within the not-at-risk group, the ESL children performed significantly more poorly than the L1 speakers on sound mimicry, $F(1, 863) = 9.36$, $p < .01$, and on the rhyme detection task, $F(1, 869) = 26.81$, $p < .01$, whereas there were no significant differences between the ESL not-at-risk children and the L1 not-at-risk children on the tasks of syllable identification, $F(1, 867) = 1.54$, *ns*, phoneme identification, $F(1, 867) = 0.79$, *ns*, or phoneme deletion, $F(1, 862) = 0.82$, *ns*. There were no significant differences between the ESL at-risk children and the L1 at-risk children on sound mimicry, $F(1, 293) = 1.13$, *ns*, syllable identification, $F(1, 293) = 1.32$, *ns*, phoneme identification, $F(1, 293) = 0.01$, *ns*, or phoneme deletion, $F(1, 293) = 1.04$, *ns*. On rhyme detection, the L1 at-risk group's performance was significantly higher than the ESL at-risk group's performance, $F(1, 293) = 12.26$, $p < .01$.

The ESL and L1 not-at-risk groups had higher scores than the ESL and L1 at-risk groups, respectively, on phonological processing measures including rhyme detection [ESL, $F(1, 140) = 7.68$, $p < .01$; L1, $F(1, 929) = 37.51$, $p < .01$], syllable identification [ESL, $F(1, 140) = 13.97$, $p < .01$; L1, $F(1, 929) = 49.38$, $p < .01$], phoneme identification [ESL, $F(1, 140) = 17.88$, $p < .01$; L1, $F(1, 929) = 59.26$, $p < .01$], and phoneme deletion [ESL, $F(1, 140) = 6.59$, $p < .01$; L1, $F(1, 929) = 29.56$, $p < .01$]. There were no significant differences between ESL at-risk and ESL not-at-risk children on sound mimicry, $F(1, 140) = 0.72$, *ns*, whereas among the L1 children, the not-at-risk group scored significantly higher than the at-risk group on sound mimicry, $F(1, 929) = 27.56$, $p < .01$.

Table 5 summarizes the results on kindergarten measures of oral language, memory, and rapid naming.

Language

On the oral cloze task, ESL children in the not-at-risk and at-risk groups performed significantly more poorly than the L1 at-risk and not at-risk groups, respectively: not at risk, $F(1, 859) = 10.35$, $p < .01$; at risk, $F(1, 292) = 11.31$, $p < .01$. The ESL and L1 not-at-risk groups' scores were significantly higher than the ESL and L1 at-risk groups' scores, respectively: ESL, $F(1, 140) = 7.69$, $p < .01$; L1, $F(1, 929) = 29.17$, $p < .01$.

Table 4
Kindergarten Mean Scores on Measures of Phonological Processing

	Not at risk		At risk	
Measure	L1 ($n = 766$)	ESL ($n = 100$)	L1 ($n = 236$)	ESL ($n = 60$)
GFW Sound Mimicry percentile				
M	82.51	76.01	73.64	69.28
SD	19.49	25.56	25.33	28.80
Rhyme detection (maximum = 10)				
M	7.24	5.64	5.71	4.03
SD	2.91	3.23	3.37	3.05
Syllable identification (maximum = 8)				
M	5.03	4.72	3.53	3.07
SD	2.38	2.19	2.81	2.67
Phoneme identification (maximum = 8)				
M	3.23	3.51	1.44	1.42
SD	3.01	2.99	2.33	1.99
Phoneme deletion (maximum = 16)				
M	3.93	3.48	2.04	1.56
SD	4.74	4.89	3.25	2.95

Note. L1 = English as native language; ESL = English as a second language; GFW = Goldman-Fristoe-Woodcock Auditory Skills Test Battery.

Table 5
Grade 2 Mean Scores on Measures of Syntactic Awareness, Memory, and Rapid Naming

Measure	Not at risk		At risk	
	L1 (n = 766)	ESL (n = 100)	L1 (n = 236)	ESL (n = 60)
Oral cloze (maximum = 12)				
M	2.63	1.68	1.55	0.56
SD	2.84	2.55	2.12	1.25
Memory for sentences (maximum = 37)				
M	17.26	14.21	15.36	13.53
SD	3.70	4.12	3.47	4.41
Rapid naming (in seconds)[a]				
M	66.46	73.86	76.73	91.13
SD	2.87	26.55	24.72	33.32

Note. L1 = English as native language; ESL = English as a second language.
[a] Scale is reversed; that is, a longer time indicates slower naming.

Memory

ESL children in the at-risk and not-at-risk groups performed significantly more poorly than the L1 at-risk and not-at-risk groups, respectively, on memory for sentences: not at risk, $F(1, 862) = 60.54$, $p < .01$; at risk, $F(1, 294) = 11.49$, $p < .01$. There were no differences between the ESL not-at-risk group and the ESL at-risk group on memory for sentences, $F(1, 140) = 1.44$, *ns*, whereas the L1 not-at-risk group's scores were significantly higher than the L1 at-risk group's scores on the memory for sentences task, $F(1, 929) = 47.91$, $p < .01$.

Rapid Naming

ESL children in the at-risk and not-at-risk groups performed significantly more poorly than the L1 at-risk and not-at-risk groups, respectively, on rapid naming: not at risk, $F(1, 852) = 10.59$, $p < .01$; at risk, $F(1, 288) = 12.57$, $p < .01$. The ESL not-at-risk group's scores were significantly higher than the ESL at-risk group's scores, $F(1, 140) = 15.07$, $p < .01$. Similarly, the L1 not-at-risk group's scores were significantly higher than the L1 at-risk group's scores, $F(1, 929) = 12.57$, $p < .01$.

Summary

In kindergarten, the L1 children performed significantly better than the ESL children on tasks of rhyme detection, pseudoword repetition, memory for sentences, syntactic awareness, rapid naming, and spelling. On all other tasks, there were no significant differences between the two language groups. There were no significant differences between the ESL at-risk and ESL not-at-risk groups on tasks of language and memory. On all other tasks, the ESL not-at-risk group performed significantly better than the ESL at-risk group. The L1 at-risk group performed significantly more poorly than the L1 not-at-risk group on all tasks.

Grade 2 Results

In order to make group comparisons between ESL and L1 speakers, and between average and disabled readers, we conducted a series of 2 × 2 ANOVAs. The ANOVAs examined within-subject factors (measures administered) and between-subjects factors (language status: ESL or L1; reader group: average reader or disabled reader). No significant main effect for language status on the battery of Grade 2 tasks was detected (effect sizes across measures ranged from .001 to .003). A significant main effect for reader group ($p < .01$) was detected on Grade 2 performance (effect sizes across measures ranged from .002 to .152). There was no interaction between language status and reader group on kindergarten performance (effect sizes across measures ranged from .001 to .002).

Reading Measures

The performance of the reader and language groups on the reading measures is shown in Table 6. There were no differences between the L1 average readers and the ESL average readers on the WRAT3 Reading subtest, $F(1, 937) = 1.59$, *ns*, and the SDRT Reading Comprehension subtest, $F(1, 937) = 0.67$, *ns*. The ESL average readers read significantly more pseudowords than did the L1 average readers on the WRMT–R Word Attack subtest, $F(1, 937) = 4.06$, $p < .01$, and significantly more words on the WRMT–R Word Identification subtest, $F(1, 937) = 4.43$, $p < .05$. There were no differences between the ESL disabled readers and the L1 disabled readers on the WRAT3 Reading subtest, $F(1, 39) = 0.27$, *ns*, the WRMT–R Word Attack subtest, $F(1, 39) = 2.87$, *ns*, the WRMT–R Word Identification subtest, $F(1, 39) = 1.69$, *ns*, or the SDRT Reading Comprehension subtest, $F(1, 39) = 0.31$, *ns*.

By definition, the L1 average readers scored significantly higher than the L1 reading-disabled children on the WRAT3 Reading subtest, $F(1, 832) = 250.87$, $p < .01$, and the ESL average readers scored significantly higher than the ESL disabled readers on the WRAT3 Reading subtest, $F(1, 195) = 66.32$, $p < .01$. The L1 and ESL average readers had significantly higher scores than the L1 and ESL disabled readers, respectively, on the WRMT–R Word Attack subtest [L1, $F(1, 833) = 162.82$, $p < .01$; ESL, $F(1, 195) = 52.02$, $p < .01$], the WRMT–R Word Identification subtest [L1, $F(1, 833) = 161.32$, $p < .01$; ESL, $F(1, 194) = 55.94$, $p < .01$], and the SDRT Reading Comprehension subtest [L1, $F(1, 809) = 101.29$, $p < .01$; ESL, $F(1, 191) = 15.75$, $p < .01$]. On the

Table 6
Grade 2 Mean Scores on Measures of Reading

Measure	Average readers		Reading disabled	
	L1 (n = 757)	ESL (n = 181)	L1 (n = 33)	ESL (n = 7)
WRAT3 Reading percentile				
M	73.97	75.71	11.30	10.57
SD	4.12	3.83	2.67	3.55
WRMT–R Word Identification percentile				
M	76.42	80.29	19.55	13.00
SD	11.95	10.26	13.89	14.97
WRMT–R Word Attack percentile				
M	74.50	77.25	23.58	16.00
SD	7.61	6.80	5.29	5.38
SDRT Reading Comprehension percentile				
M	55.51	54.14	14.06	14.83
SD	3.62	3.32	8.22	7.91
One-minute word reading[a] (maximum = 44)				
M	22.68	24.24	10.17	8.33
SD	5.46	4.51	4.25	3.20
One-minute pseudoword reading (maximum = 45)				
M	24.18	26.28	6.28	8.33
SD	8.74	7.49	4.70	3.20

Note. L1 = English as native language; ESL = English as a second language; WRAT3 = Wide Range Achievement Test 3; WRMT–R = Woodcock Reading Mastery Tests–Revised; SDRT = Stanford Diagnostic Reading Test.
[a] Number correct.

one-minute word reading test, the L1 and ESL average readers read significantly more words than the L1 and ESL reading-disabled groups, respectively [L1, $F(1, 759) = 124.89$, $p < .01$; ESL, $F(1, 179) = 42.35$, $p < .01$], and read more pseudowords on the one-minute pseudoword reading test [L1, $F(1, 829) = 113.83$, $p < .01$; ESL, $F(1, 194) = 29.69$, $p < .01$]. The effect sizes for the reading measures ranged from .12 to .22.

Syntactic Awareness, Phonological Processing, and Rapid Naming

Table 7 summarizes the results on Grade 2 measures of syntactic awareness, phonological processing, and rapid naming. The ESL average readers performed significantly more poorly than the L1 average readers on the oral cloze task, $F(1, 935) = 42.65$, $p < .01$, whereas the ESL average readers' performance on the rapid naming task was significantly higher than the L1 average readers' performance, $F(1, 935) = 4.38$, $p < .05$. There were no significant differences between ESL and L1 average readers on the Rosner Auditory Analysis Test, $F(1, 935) = 1.43$, *ns*, and there were no differences between the ESL and L1 disabled readers on the oral cloze task, $F(1, 39) = 0.85$, *ns*, the Rosner Auditory Analysis Test, $F(1, 39) = 0.60$, *ns*, or the rapid naming task, $F(1, 39) = 0.01$, *ns*.

The patterns of results within the two language groups were similar. The L1 and ESL average readers had significantly higher scores than the L1 and ESL disabled readers, respectively, on the

Table 7
Grade 2 Mean Scores on Measures of Syntactic Awareness, Phonological Processing, and Rapid Naming

Measure	Average readers		Reading disabled	
	L1 (n = 757)	ESL (n = 181)	L1 (n = 33)	ESL (n = 7)
Oral cloze (maximum = 11)[a]				
M	7.63	6.68	5.18	4.71
SD	1.66	2.10	1.69	2.69
Rosner Auditory Analysis Test (maximum = 30)				
M	22.02	22.60	12.82	17.50
SD	5.89	5.68	6.24	6.66
Rapid naming (in seconds)[a]				
M	12.84	12.37	15.72	15.57
SD	2.99	2.69	3.53	4.93

Note. L1 = English as native language; ESL = English as a second language.
[a] Scale is reversed; that is, a longer time indicates slower naming.

oral cloze task [L1, $F(1, 835) = 66.58$, $p < .01$; ESL, $F(1, 192) = 5.14$, $p < .05$], the Rosner Auditory Analysis Test [L1, $F(1, 835) = 72.65$, $p < .01$; ESL, $F(1, 193) = 4.35$, $p < .05$], and the rapid naming task [L1, $F(1, 835) = 24.98$, $p < .01$; ESL, $F(1, 194) = 8.74$, $p < .01$].

The performance of the reader and language groups on the measures of working memory and arithmetic is shown in Table 8.

Working Memory

There were no differences between ESL and L1 disabled readers on the working memory for numbers task, $F(1, 39) = 3.19$, *ns*, or the working memory for words task, $F(1, 39) = 0.04$, *ns*. Similarly, there were no significant differences between ESL and L1 average readers on the working memory for numbers task, $F(1, 935) = 0.04$, *ns*, or the working memory for words task, $F(1, 39) = 1.79$, *ns*.

The patterns of results for the two language groups on the working memory measures were different. Among the L1 children, there were no significant differences between average and disabled readers on the working memory for numbers task, $F(1, 835) = 3.26$, *ns*, whereas among the ESL children, the average readers performed significantly better than the disabled readers on the working memory for numbers task, $F(1, 194) = 4.55$, $p < .05$. In contrast, there were no significant differences between the ESL average and disabled readers on the working memory for words task, $F(1, 193) = 0.47$, *ns*, whereas the L1 average readers performed significantly better than the L1 disabled readers on the working memory for words task, $F(1, 834) = 10.38$, $p < .01$.

Arithmetic

The performance of the ESL average readers was significantly higher than that of the L1 average readers on the WRAT3 Arithmetic subtest, $F(1, 908) = 25.89$, $p < .01$. Within the disabled readers group, there were no differences between the ESL and L1 children on the WRAT3 Arithmetic subtest, $F(1, 39) = 0.71$, *ns*.

The patterns of results for the language groups were similar. The L1 and ESL average reader groups performed significantly better than the L1 and ESL disabled readers, respectively: L1, $F(1, 804) = 29.20$, $p < .01$; ESL, $F(1, 191) = 4.82$, $p < .05$.

Spelling

Table 9 shows the performance of the reader and language groups on the spelling measures. The ESL average readers' performance was significantly higher than the L1 average readers' performance on the WRAT3 Spelling subtest, $F(1, 903) = 20.97$, $p < .01$, on real word spelling, $F(1, 934) = 12.23$, $p < .01$, and on nonword spelling, $F(1, 933) = 16.32$, $p < .01$. There were no differences between ESL and L1 disabled readers on the WRAT3 Spelling subtest, $F(1, 38) = 0.39$, *ns*, on real word spelling, $F(1, 38) = 0.01$, *ns*, and on nonword spelling, $F(1, 38) = 0.02$, *ns*.

The patterns of results for the language groups were similar. The L1 and ESL average readers performed significantly better than the L1 and ESL disabled reader groups, respectively, on the WRAT3 Spelling subtest [L1, $F(1, 800) = 110.45$, $p < .01$; ESL, $F(1, 190) = 35.49$, $p < .01$], on real word spelling [L1, $F(1, 737) = 136.76$, $p < .01$; ESL, $F(1, 178) = 68.96$, $p < .01$], and on nonword spelling [L1, $F(1, 736) = 70.29$, $p < .01$; ESL, $F(1, 177) = 5.97$, $p < .01$].

Summary

In Grade 2, the performance of the ESL children was significantly better than that of the L1 children on the WRMT–R Word Identification subtest, the rapid naming task, the WRAT3 Spelling subtest, real word spelling, nonword spelling, the one-minute pseudoword reading task, the one-minute word reading task, and the WRAT3 Arithmetic subtest. On the oral cloze task, the performance of the ESL children was significantly lower than that of the L1 children. On all other tasks, there was no difference between the language groups. Among the ESL children, there was no significant difference between the disabled readers and the average readers on the working memory for words task. On all other tasks, the ESL average readers performed significantly better than the ESL disabled readers. Among the L1 children, there was no significant difference between disabled readers and average readers on the working memory for numbers task. On all other tasks, the L1 average readers performed significantly better than the L1 disabled readers.

Table 8
Grade 2 Mean Scores on Measures of Working Memory and Arithmetic

	Average readers		Reading disabled	
Measure	L1 (n = 757)	ESL (n = 181)	L1 (n = 33)	ESL (n = 7)
Working memory words (maximum = 12)				
M	3.52	3.34	2.61	2.86
SD	1.56	1.76	1.39	1.46
Working memory numbers (maximum = 12)				
M	6.16	6.22	5.36	4.14
SD	2.36	2.46	2.26	1.07
WRAT3 Arithmetic percentile				
M	52.46	59.26	31.64	38.50
SD	22.32	2.89	17.51	13.35

Note. L1 = English as native language; ESL = English as a second language; WRAT3 = Wide Range Achievement Test 3.

Table 9
Grade 2 Mean Scores on Measures of Spelling

Measure	Average readers		Reading disabled	
	L1 (n = 757)	ESL (n = 181)	L1 (n = 33)	ESL (n = 7)
WRAT3 Spelling percentile				
M	62.96	70.01	20.61	16.83
SD	2.96	3.28	2.19	1.94
Real word spelling (maximum = 10)				
M	8.88	9.29	5.12	5.17
SD	1.42	1.07	2.32	2.20
Nonword spelling (maximum = 10)				
M	8.40	9.24	5.52	5.67
SD	1.54	1.86	2.73	1.97

Note. L1 = English as native language; ESL = English as a second language; WRAT3 = Wide Range Achievement Test 3.

Prediction of Word Reading and Reading Comprehension

In order to examine the contribution of kindergarten phonological processing, syntactic awareness, rapid naming, and letter identification to performance on Grade 2 WRAT3 reading, we conducted hierarchical regression analyses. These variables were chosen on the basis of their prevalence in the early reading research and to address existing hypotheses about the importance of phonological processing, exposure to print (letter identification), rapid naming, and syntactic awareness for later reading ability. And for the children in the present sample from ESL-speaking backgrounds, the syntactic awareness task provided insight into the importance of kindergarten facility with the English language for early reading. Separate analyses were conducted for the L1 and ESL groups. All assumptions for hierarchical regression were met. All children in the sample were included in the regression analyses. For both analyses, Grade 2 WRAT3 Reading subtest performance was the dependent variable. In each analysis, rhyme detection was entered as the first variable (Step 1), and letter identification, rapid naming, and oral cloze were entered one at a time in subsequent steps. Tables 10 and 11 provide a summary of the regression analyses. For the L1 group, letter identification explained 8% of the variance. Letter identification was followed by rhyme detection, which explained an additional 5% of the variance. Oral cloze accounted for an additional 3% of the variance, followed by rapid naming, which explained an additional 2% of the variance. For the ESL group, rhyme detection explained 11% of the variance. After rhyme detection, letter identification explained an additional 7% of the variance. Rapid naming and oral cloze were not significant predictors of ESL speakers' Grade 2 WRAT3 Reading subtest performance.

In order to examine the contribution of kindergarten variables to performance on Grade 2 SDRT Reading Comprehension, we conducted additional hierarchical regression analyses. Two separate analyses were conducted for the L1 and ESL groups. All assumptions for hierarchical regression were met. All children in the sample were included in the regression analyses. For both analyses, Grade 2 SDRT Reading Comprehension subtest performance was the dependent variable. In each analysis, rhyme detection was entered as the first variable (Step 1), and letter identification, rapid naming, and oral cloze were entered one at a time in subsequent steps. Tables 12 and 13 provide a summary of the regression analyses. For the L1 group, letter identification explained 11% of the variance. Letter identification was followed by rhyme detection, which explained an additional 5% of the variance. Rapid naming accounted for an additional 1% of the variance, and oral cloze explained 0.8% of the variance. For the ESL group, rhyme

Table 10
Regression Analysis Predicting L1 Children's WRAT3 Reading Performance in Grade 2

Kindergarten variable	R^2	ΔR^2	t(951)
Step 1			
Rhyme detection	.047	.047	2.81**
Step 2			
Letter identification	.126	.079	5.87**
Step 3			
Rapid naming	.141	.015	−3.14**
Step 4			
Oral cloze	.167	.026	4.42**

Note. L1 = English as native language; WRAT3 = Wide Range Achievement Test 3.
** $p < .01$.

Table 11
Regression Analysis Predicting ESL Children's WRAT3 Reading Performance in Grade 2

Kindergarten variable	R^2	ΔR^2	t(169)
Step 1			
Rhyme detection	.112	.112	1.89*
Step 2			
Letter identification	.177	.065	2.38**
Step 3			
Rapid naming	.179	.002	0.52
Step 4			
Oral cloze	.188	.009	0.95

Note. ESL = English as a second language; WRAT3 = Wide Range Achievement Test 3.
* $p < .05$. ** $p < .01$.

Table 12
Regression Analysis Predicting L1 Children's SDRT Reading Comprehension Performance in Grade 2

Kindergarten variable	R^2	ΔR^2	$t(947)$
Step 1			
Rhyme detection	.048	.048	3.082**
Step 2			
Letter identification	.154	.106	7.316**
Step 3			
Rapid naming	.167	.013	−3.041**
Step 4			
Oral cloze	.176	.008	2.508*

Note. L1 = English as native language; SDRT = Stanford Diagnostic Reading Test.
* $p < .05$. ** $p < .01$.

detection explained 17% of the variance in reading comprehension performance. After rhyme detection, letter identification explained an additional 7% of the variance. Rapid naming and oral cloze were not significant predictors of Grade 2 ESL speakers' SDRT Reading Comprehension subtest performance.

Kindergarten and Grade 2 Risk Classification

Figure 1 shows the results of the kindergarten and Grade 2 assessments. As shown in Figure 1, 23.80% of the L1 children were identified as at risk for reading failure in kindergarten, whereas 76.20% of the L1 children were identified as not at risk for reading failure. In kindergarten, 37.20% of the ESL children were identified as at risk for reading failure, and 62.80% of the ESL children were identified as not at risk for reading failure. In Grade 2, 4.20% of the L1 children were identified as reading disabled, and 95.80% of the L1 children were identified as average readers. Of the ESL children in Grade 2, 3.72% were identified as reading disabled, and 96.28% were identified as average readers.

Discussion

The findings of the present study demonstrate that the time course of ESL reading development is not predetermined by lack of language proficiency in English upon entering school. It is clear

Table 13
Regression Analysis Predicting ESL Children's SDRT Reading Comprehension Performance in Grade 2

Kindergarten variable	R^2	ΔR^2	$t(169)$
Step 1			
Rhyme detection	.168	.168	2.679**
Step 2			
Letter identification	.239	.071	2.364*
Step 3			
Rapid naming	.241	.002	−0.389
Step 4			
Oral cloze	.243	.003	0.531

Note. ESL = English as a second language; SDRT = Stanford Diagnostic Reading Test.
* $p < .05$. ** $p < .01$.

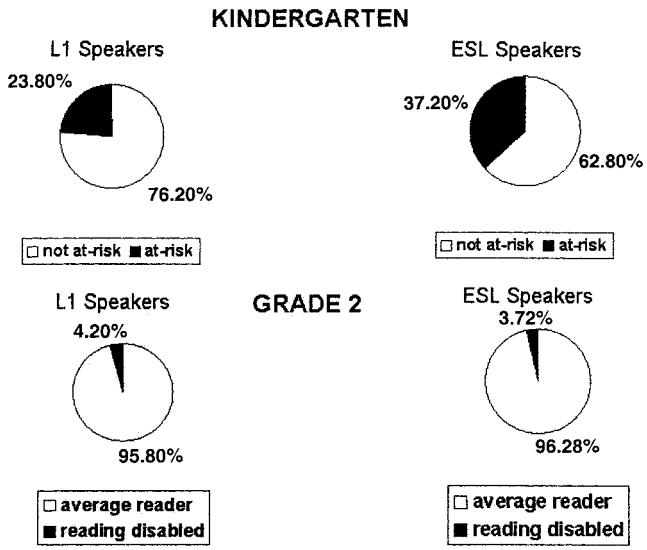

Figure 1. Frequency of reader types by native language: kindergarten versus Grade 2.

that kindergarten phonological awareness instruction in the context of a balanced early literacy program is as effective for ESL speakers as it is for L1 speakers in the early grades of school. The impact of the intervention is evident when one examines basic reading and spelling skills as well as reading comprehension. In response to the literature that calls for further understanding of the methods that work best to give ESL children access while they are learning English to the academic opportunities that native English speakers have (e.g., August & Hakuta, 1997), it is clear that theoretically motivated and appropriate instruction is generally effective in helping ESL children acquire the skills necessary for academic success.

Although the ESL-speaking children had difficulties in kindergarten, by Grade 2 they had, in most cases, caught up and, in some cases, surpassed the performance of the native English speakers on various tasks. In kindergarten, the ESL-speaking children performed more poorly than the L1 children on the tasks of rhyme detection, pseudoword repetition, memory for sentences, syntactic awareness, and rapid naming. These tasks require children to manipulate and remember English, and they proved difficult for all ESL-speaking children compared with their native English-speaking peers. There were no significant differences between the ESL at-risk and ESL not-at-risk children on the tasks of sentence memory and pseudoword repetition. Performance on the memory for sentences task is one that is confounded by vocabulary knowledge and syntactic awareness, and pseudoword repetition is a task that involves phonological processing skills. Globally, these tasks relate to children's language skills. The ESL children entered school with difficulties in English, as evidenced by their poorer performance on the oral cloze task compared with their native English-speaking peers. These findings are consistent with previous research showing that many language-minority children enter schools at risk for oral language difficulties as well as at risk for difficulties with phonological and print-related knowledge for word reading (Foorman & Torgesen, 2001).

By Grade 2, the ESL children had acquired the sound–symbol relationships of the English language to the extent that they were reading and spelling at a level equivalent to, and in some cases better than, that of their L1 peers. Previous research on ESL-speaking children has also demonstrated the ability of ESL speakers to perform at the same levels as their L1 peers on tasks of reading and spelling (Geva et al., 2000). On the tasks of word reading, rapid naming, real word and nonword spelling, and arithmetic, the performance of the ESL children was significantly better than that of the L1 children. The frequency with which ESL children were classified as reading disabled in Grade 2 was virtually the same as the frequency with which L1 children were so classified.

The results of this study may be explained from a linguistic perspective; despite their higher risk status in kindergarten, ESL-speaking children increased their metalinguistic awareness as they acquired English, and this increase may account for their elevated performance on tasks of phonological awareness. These findings are consistent with the findings of previous research on the positive effects of bilingualism (e.g., Bialystok, 1997; Campbell & Sais, 1995). On the pseudoword reading task, the ESL average reader group performed at a significantly higher level than the L1 children. This result supports previous research that has found that even if a young child is still developing phonological awareness skills in his or her native language, these skills from the child's first language help reading acquisition in a second language and can be a stronger predictor of reading ability than is oral proficiency in either the child's native or second language (i.e., Cisero & Royer, 1995; Durgunoglu et al., 1993).

The same variables in kindergarten identified the children at risk in the ESL and L1 groups. These results suggest that the research that has identified kindergarten phonological awareness as one of the single best predictors of reading development in native English speakers (e.g., Share et al., 1984) may be extended to ESL speakers. For L1 children, rhyme detection, letter identification, rapid naming, and syntactic awareness accounted for 17% of the variance in Grade 2 reading performance. For the ESL children, rhyme detection and letter identification accounted for 18% of the variance in Grade 2 word reading performance. Although moderate, these predictions support the idea that even in a large and diverse sample, it is possible to identify the kindergarten skills that lend themselves to future reading ability. Syntactic awareness in kindergarten, although a significant predictor of Grade 2 reading performance for the L1 children, did not explain a significant amount of variance for the ESL group.

For reading comprehension, a similar pattern of results was evident. For the L1 speakers, letter identification accounted for the most variance in reading comprehension, followed by rhyme detection, rapid naming, and oral cloze performance. In the ESL group, rhyme detection explained the most variance in reading comprehension, followed by letter identification. As with word reading, rapid naming and oral cloze performance were not significant predictors of Grade 2 reading comprehension for ESL speakers. These results suggest that for L1 speakers, kindergarten measures of letter identification, phonological processing, rapid naming, and syntactic awareness in combination prove significant in predicting word reading and reading comprehension performance in Grade 2. However, for the ESL group, phonological processing explained the most variance in word reading and reading comprehension in Grade 2. Although letter identification was also important for the ESL group in kindergarten, oral cloze performance and rapid naming were not predictors of Grade 2 word reading ability. As a result of the impact of the intervention and the kindergarten literacy program, the variables did not show the high level of prediction found in some studies; the intervention appeared to modify the predictive nature of the variables because it provided remediation for the difficulties experienced by the children.

The results of the regression analysis provide support for a phonological processing model of reading acquisition for the ESL speakers given that phonological processing was found to be more predictive of Grade 2 word reading ability and reading comprehension than were other measures such as exposure to print (letter naming), syntactic awareness, and rapid naming. The contributions of variables such as rapid naming, oral cloze performance, and letter identification were not found to account for a significant amount of variance in ESL children's word reading; thus, although these are skills that are related to word reading, for this population, phonological processing was the single best predictor of Grade 2 word reading ability.

Although a subgroup of ESL-speaking children did experience difficulty with reading acquisition in English, their performance profile is very similar to that of the L1 children with a reading disability. Reading disability, in the L1 children and the ESL children, was characterized by low scores on all measures of phonological processing as well as on syntax and working memory. The phonological processing difficulties for the children with reading disability are reflected in their extremely low scores on the one-minute word reading task and their even lower scores on the one-minute pseudoword reading task. Both of these tasks demand effective, fluent decoding. The L1 and ESL disabled readers had difficulty with reading, spelling, and phonological processing tasks, including working memory. The similar difficulties of the disabled readers across both language groups are consistent with previous research that demonstrated the role that phonological processing, syntactical awareness, and working memory play in the development of reading skills in English (for a review, see Siegel, 1993) and provide further evidence that these cognitive processes are also important for children who are ESL speakers (e.g., Chiappe & Siegel, 1999; da Fontoura & Siegel, 1995; Fitzgerald, 1995). One difference between the L1 and ESL disabled readers to consider, however, is the significantly higher arithmetic performance of the ESL reading-disabled children compared with the L1 reading-disabled children, possibly because verbal skills are not required for this task to the same degree that they are for other tasks. Another possible explanation for this finding is that there are cultural differences in the emphasis placed on numbers and counting.

It is critical to note that among the average reader population, the ESL children performed at a significantly lower level in the area of syntactical skills. The absence of difficulty with word recognition tasks despite lower scores in syntactic awareness is consistent with findings from previous research in the area of second-language reading acquisition (e.g., Chiappe & Siegel, 1999; da Fontoura & Siegel, 1995). Although the ESL children had native English-speaking peers and teachers as oral language models from kindergarten through Grade 2, this exposure was not

sufficient to develop their syntactic skills to the same extent as those of their L1 peers.

In the area of reading comprehension, the ESL children performed at levels comparable to those of the L1 average readers. This finding is inconsistent with previous findings in research on second-language reading acquisition. Verhoeven (1990) found that even after 20 months of literacy instruction, bilingual Turkish Dutch children, although comparable in word recognition, performed more poorly in the area of reading comprehension than their monolingual Dutch-speaking peers. Verhoeven (1990) attributed the lower performance to syntactic ability and oral proficiency. Research results with Turkish Dutch children have converged to indicate that Turkish Dutch children often lag behind their monolingual Dutch-speaking peers (Aarts & Verhoeven, 1999). One of the differences between the groups is that the Turkish Dutch children often come from low socioeconomic backgrounds, and related variables such as home stimulation, parents' motivation, and the children's self-esteem have been linked to lower levels of literacy attainment in this group of language-minority children (Aarts & Verhoeven, 1999). For the children in the present study, the similar performance of ESL and L1 speakers on a measure of reading comprehension may be due to the phonological awareness intervention and/or to the lack of differences in SES between the two language groups.

The results of the present study suggest that ESL speakers respond to balanced literacy instruction in a manner similar to that of L1 speakers and that a kindergarten model of early identification and intervention for children at risk for reading failure is effective for children who enter kindergarten with little or no experience with English. The ESL children entered kindergarten with little or no English, and by Grade 2, they were able to attain a level of achievement in the areas of reading and spelling comparable to that of their native English-speaking peers. This finding is consistent with previous research (e.g., Geva et al., 2000). It is evident that the development of reading skills in children who speak English as a second language is very similar to the development of reading skills in native English speakers. The successful acquisition of the sound–symbol relationship in English for early reading is dependent on such factors as instruction and individual differences as opposed to fluency and proficiency with the English language. Difficulties in acquiring the sound–symbol relationship for fluent, automatic decoding arise in approximately 20% of children (Lyon, 1995). Within the sample in this study, it is important to note that approximately 4% of the children continued to experience reading failure. These results are consistent with previous research with native English speakers showing that well-balanced and skilled instruction in the classroom drastically decreased the number of children experiencing reading failure in Grades 1 and 2 who needed individualized intervention (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998). The results from the present study indicate that such a finding may extend to speakers from diverse linguistic backgrounds who are immersed in English reading instruction.

For the majority of children who experienced early reading difficulties in kindergarten, their difficulties were likely remediated through a balanced early reading program that included small-group phonological awareness instruction for all children regardless of language status or ability as well as phonics instruction in Grade 1. The kindergarten phonological awareness training for all children was provided in the context of a variety of literacy activities, which included a combination of activities with an explicit emphasis on the sound–symbol relationship as well as independent activities. Many of the at-risk children received targeted, direct phonological awareness instruction in small groups in Grade 1 as well. This model provides considerable support for the benefits of small-group instruction in kindergarten and a balanced approach to literacy activities in order to reduce the incidence of reading failure in Grade 1 and Grade 2 for the majority of children (Foorman & Torgesen, 2001). This model of instruction is clearly appropriate and beneficial for children who are from minority language backgrounds.

There is a higher incidence of school dropout among high school students from ESL backgrounds than among native English-speaking high school students (Gunderson & Clarke, 1998). As demonstrated by the greater percentage of ESL-speaking children identified as at risk in kindergarten in the present study, and by their poorer performance than L1 children on various tasks, entering a kindergarten classroom conducted in a language in which children were not yet proficient was an additional risk factor. However, for the majority of this group, their response to instruction and their subsequent early reading development were very similar to those of their L1 peers. Systematic student assessment in kindergarten and explicit skills instruction are critical to a model of early reading acquisition for children from diverse linguistic backgrounds. For those ESL-speaking children who experience difficulty with early reading acquisition in English, the results of this study demonstrate that, as in L1 speakers, this difficulty is related to phonological awareness ability. For all children to receive an equal opportunity to develop fluent reading skills, it is critical that both native English-speaking and ESL-speaking children at risk for reading failure be identified at a young age. Once they are identified as having early reading difficulty, children must receive early intervention that includes, but is not limited to, explicit phonological awareness instruction. For the population of children in this study, who were part of a school district committed to balanced early literacy instruction, bilingualism was clearly not an impediment to the acquisition of literacy skills in a second language and may have facilitated reading acquisition.

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