Weak and Strong Novice Readers of English as a Foreign Language: Effects of First Language and Socioeconomic Status

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This study examined individual differences among beginning readers of English as a foreign language (EFL). The study concentrated on the effects of underlying first language (L1) knowledge as well as EFL letter and vocabulary knowledge. Phonological and morphological awareness, spelling, vocabulary knowledge, and word reading in Hebrew L1, in addition to knowledge of EFL letters and EFL vocabulary, were measured. The study also investigated the effect of socioeconomic background (SES) on beginning EFL readers. Participants included 145 fourth graders from three schools representing two socioeconomic backgrounds in the north of Israel. The results indicate that knowledge of English letters played a more prominent role than knowledge of Hebrew L1 components in differentiating between strong and weak EFL readers. The Linguistic Coding Differences Hypothesis was supported by L1 phonological awareness, word reading, and vocabulary knowledge appearing as part of discriminating functions. The presence of English vocabulary knowledge as part of the discriminant functions provides support for English word reading being more than just a decoding task for EFL beginner readers. Socioeconomic status differentiated the groups for EFL word recognition but not for EFL reading comprehension.

Annals of Dyslexia, Vol. 56, No. 1, 2006

ISSN 0736-9387

Key Words: Foreign language, reading, socioeconomic status, weak and strong beginners

Automatic decoding, semantic knowledge, and metacognitive abilities are essential for first (L1) as well as foreign language (FL) reading comprehension (Biemiller, 2003; Durgunoglu, 2002; Lundberg, 2002; Nation & Snowling, 2004; Stanovich, 2000). Poor readers are often characterized by their inefficient decoding skills (Swanson & Alexander, 1997; Vellutino & Scanlon, 1986) as well as less developed vocabulary knowledge (Nation & Snowling, 2004; Snow, Burns, & Griffin, 1998). The present research focuses on individual differences in reading that explain weak English foreign language (EFL) reading acquisition.

The Linguistic Coding Differences Hypothesis (LCDH), which claims that difficulties in L1 linguistic codes (specifically phonological/orthographic, syntactic and semantic) will transfer to FL learning (including reading), provides a framework for understanding students' individual differences in language learning. The authors of the LCDH have found that middle-high SES, older students with significant differences in native language skills in high school and college also exhibited significant differences in their FL achievement and proficiency (Ganschow, Sparks, Javorsky, Pohlman, & Bishop-Marbury, 1991; Sparks et al., 1998; Sparks, Ganschow, Javorsky, Pohlman, & Patton, 1992). In the present research, the LCDH was tested with Hebrew-speaking elementary school students from two different socioeconomic status backgrounds.

Both English and Hebrew are alphabetic orthographies. English is considered to be an opaque orthography due to its complex orthographic as well as syllabic structure (Seymour, Aro, & Erskine, 2003; Spencer, 2000). Vowelized Hebrew is considered a transparent orthography in that direct grapheme-phoneme translation results in correct word recognition (Geva, Wade-Woolley, & Shany, 1993). Unvowelized Hebrew is considered opaque due to the fact that many unvowelized Hebrew words presented in isolation can be read in numerous ways. In the case of unvowelized Hebrew, the reader is dependent on context in order to correctly decode many words.

DECODING HEBREW WORDS BY ROOT AND WORD PATTERN

Hebrew belongs to the Semitic family of languages and is a root-based morphology. Unlike the concatenative or linear morphological structure of English words, most Hebrew words or

word stems are made up of consonantal roots that provide semantic information and word patterns that are affixed or intertwined with the roots in a nonconcatenative manner. Word patterns integrate three root letters (Shimron, 2003). For example, in the word *talmid* "pupil," the root *"lmd"* loosely refers to the semantic meaning "studied" and the nominal word pattern is denoted by *"ta- -i-."* Word patterns are mainly represented by vowels and affixes, and they denote syntactical category (Ravid, 2003). The root and word pattern form a bound morpheme with specific phonological, morphological, and semantic characteristics. Young Hebrew speakers develop a sensitivity toward the root-word pattern structure of the language as a result of acquiring speech and reading in a root-based morphology (Berman, 2003; Levin, Ravid, & Rapaport, 2001; Ravid, 2003), particularly when it is taught explicitly in school as a word recognition technique (Bentin & Frost, 1995). In acquiring English reading, native Hebrew speakers may face difficulties resulting from the possible intrinsic differences in word recognition processes that stem from the different morphological constructs of Hebrew and English. It may be that different strategies are used in performing word recognition in the two languages (Geva, 1995; Koda, 1995; Wydell & Butterworth, 1999). When students are studying a FL that is based on the same linguistic properties as their native language, they may use the same skills as they do in their first language for new word recognition. This hypothesis is compatible with the LCDH. When there are considerable differences between the two orthographies, then word recognition strategies may need to be adapted.

Some evidence exists that Hebrew words are decoded via word decomposition, identifying the root and then its morphological pattern (Bentin & Frost, 1995; Berent & Shimron, 1997; Frost, Forster, & Deutsch, 1997). It will be of theoretical and practical interest to determine whether the LCDH is relevant to success in English reading acquisition in the present study. The question is, considering the differences in the two languages, is L1 ability in Hebrew, measured by morphological, phonological, semantic, spelling, and word recognition skills, still accountable for reading acquisition in EFL? It may be that Hebrew-speaking students must adopt a different word recognition approach, and this "approach-shifting" ability explains and predicts the difficulties of young Hebrew learners in the acquisition of different strategies in English reading. An alternative interpretation of Hebrew morphological structure assisting

word recognition would be to perceive it as a combination of word stem and affix, creating a concatenative or linear morphological structure. Shimron (2003) suggests that Hebrew readers may have the flexibility to decode words by root and word pattern decomposition or, depending on the morphological productivity, decode words in a more linear way relating to the word stem and affix. If this interpretation is accepted, the distance between L1 Hebrew and EFL word recognition would not be so great, thus facilitating transfer of strategies. As to whether Hebrew morphological knowledge can differentiate between students who succeed in EFL reading comprehension and those who do not, it could be that students who have a keen sense of the morphological composition of their first language (root and word pattern structure), which links them to both semantic and syntactic information, would possibly be sensitive to comprehending words that make up sentences and sentences that make up texts in a newly acquired FL. Within this framework, morphological awareness may be an independent variable mediating the correlation between Hebrew and English reading.

DIFFERENTIATING BETWEEN WEAK AND STRONG L1 AND EFL READERS

Reading disabled students are weaker than their normal achieving counterparts on a variety of skills—phonological/orthographic, morphological, syntactic, and verbal memory—in their first language (Ben-Dror, Bentin, & Frost, 1995; Scanlon & Vellutino, 1997; Shankweiler et al., 1995; Siegel & Ryan, 1984; Swanson & Alexander, 1997; Vellutino & Scanlon, 1986) and also in a FL (Ganschow et al., 1991; Geva, 1995; Sparks et al., 1998; Sparks et al., 1992). These skills were found to be the components of a general language ability that best predicted oral and written proficiency in a FL (Service, 1992; Sparks & Ganschow, 1991, 1993; Sparks, Ganschow, & Patton, 1995; Sparks et al., 1997).

Phonological processing is crucial for acquiring decoding skills. A reader encountering a new word will likely use phonological processing to apply phoneme-grapheme correspondence to decode the word. Only after an unfamiliar word is read several times does the reader use the orthographic representation of the word as a whole to directly access the pronunciation of the word from memory (Ehri, 1992, 2005; see Share, 1995). Phonological processing as measured by pseudoword reading, a relatively pure decoding task that involves grapheme-phoneme translation, storing phonological units in short-term memory and subsequent blending independent of semantic as-

sociations, is seen to be the most common and most significant differentiator between strong and weak readers (Chiappe, Stringer, Siegel, & Stanovich, 2002; Compton, 2002; Perfetti & Hogaboam, 1975; Share & Stanovich, 1995; Siegel, 1998; Siegel & Ryan, 1984; Swanson & Alexander, 1997; Vellutino & Scanlon, 1986). Pseudoword reading differences between weak and strong readers have been found across orthographies (Goswami, 2002) as well as across different IQ levels, and poor phonological processing cannot be compensated for by other processing abilities (Siegel, 1998). Phonological processing is also seen as a stable modular ability that developmentally retains its differentiating ability (Wagner et al., 1997).

Fast word recognition has been found to differentiate between good and poor elementary school L1 readers (Perfetti, 1983) as well as FL readers (Dufva & Voeten, 1999). Rapid reading is also a prerequisite for L2 fluent reading (Grabe, 1991; Taguchi, 1997). An increase in L2 reading speed frees cognitive resources to concentrate on higher level processes such as reading comprehension (Segalowitz, Poulson, & Komoda, 1991).

The role of semantic skills in differentiating between good and poor readers (regarding their word recognition skills) has been investigated in both FL and L1 research. Researchers have found that when intelligence and socioeconomic background are controlled, semantic skills do not differentiate normally achieving as opposed to reading disabled students (Siegel & Ryan, 1984; Vellutino & Scanlon, 1986). However, older poor readers (Ben-Dror, Bentin, & Frost, 1995) as well as readers from low socioeconomic backgrounds (Scanlon & Vellutino, 1997; Stanovich, 1988) were characterized by poorer semantic knowledge.

Vocabulary knowledge, one measure of semantic skills, has been found to be a good predictor of proficiency in reading comprehension in high school students studying French, Spanish, and German as a FL (Sparks, Ganschow, & Patton, 1995; Sparks et. al., 1997), as well as for English as a Second Language (ESL) reading comprehension among college students (Laufer, 1995; Nassaji & Geva, 1999). The FL literature that has addressed the issue of whether vocabulary knowledge differentiates strong versus weak FL readers points to nonuniform results. This finding could be the result of the testing measures—L1, L2, or FL—used in the studies as well as participant age differences. Geva, Yaghoub-Zadeh, and Schuster (2000) found that an ESL vocabulary measure did not predict word reading for first grade ESL students. However, Dufva and Voeten (1999) found that for older elementary school EFL

learners, L1 Finnish listening comprehension was a moderate predictor of beginning EFL reading success. Geva et al. (2000) used an ESL receptive vocabulary measure whereas Dufva and Voeten used a L1 Finnish listening comprehension task. Both language factors (English versus Finnish) as well as the testing measures used could explain the different outcomes in these studies. Listening comprehension includes vocabulary knowledge as well as language components such as syntactic and morphological sensitivity. The aforementioned evidence shows that for younger elementary school children, L1 listening comprehension but not ESL specific receptive vocabulary knowledge predicted beginning EFL/ESL reading success.

EFFECT OF SOCIOECONOMIC STATUS ON ACADEMIC PERFORMANCE

In Sirin's (2005) metaanalysis of 74 independent samples covering 101,157 students in 6871 schools in 128 school districts in the United States, SES had a medium to strong SES achievement relation. But this relation is moderated by the unit, the source, the range of SES variables, and the type of SES-achievement measures. In one study, Duncan and Seymour (2000) found that lower SES elementary students were delayed by a year in knowledge of letter sounds, letter names, and word, as well as nonword reading when compared to their higher SES counterparts; however, both lower and higher SES groups followed the same literacy developmental path. Delayed literacy development in students from poorer SES backgrounds could also result from exposure to less advantaged educational environments (Stanovich, 2000), as well as less communication and cooperation between families and school staff (Sirin, 2005). SES has been found to affect foreign language acquisition as well (Ministry of Education, Culture, & Sport, Office of the Chief Scientist, 1999; Olshtain, Shohamy, Kemp, & Chatow, 1990).

PURPOSE OF STUDY

In a related study, Kahn-Horwitz, Shimron, and Sparks (2005) found that phonological and morphological awareness, word recognition, and spelling measured in Hebrew predicted performance on EFL reading measures. Although the present study draws evidence from the same database as the aforementioned article, the unique focus of the current research is on individual differences in linguistic and literacy abilities between two sub-

groups of the original sample: weak as opposed to strong EFL readers after their first year of EFL reading acquisition. In addition, this study examines the influence of SES, specifically whether SES differentiates between weak and strong EFL readers. This research aimed to identify reading-related characteristics of weak EFL readers from two SES backgrounds.

The research questions examined were:

1. Which EFL literacy and linguistic measures (EFL vocabulary knowledge and knowledge of EFL letter sounds and names) and L1 (Hebrew) linguistic and literacy measures (measured by phonological and morphological awareness, vocabulary knowledge, word reading, and spelling) differentiated weak as opposed to strong EFL readers (measured by EFL word recognition and EFL reading comprehension) after their first year of EFL acquisition (end of fourth grade)?
2. Whether socioeconomic background differentiated between the groups.

METHOD

PARTICIPANTS

One hundred and forty-five students from three different northern Israeli elementary schools at the beginning of the fourth grade were selected to participate in the study. From this group of students, none of whom were formally identified as reading disabled, weak as opposed to strong EFL readers, were compared as a means for measuring relative individual differences within the group. To do this, scores on the two dependent measures, English word reading and English reading comprehension, were converted into z scores. Students with a composite z score above 1 comprised the strong EFL reader group ($z > 1$) for each of the two dependent variables. Students scoring a composite z score less than –1 comprised the weak EFL readers group ($z < -1$). For word reading, the weak group comprised 27 students and the strong group comprised 23 students. For reading comprehension, the weak group comprised 70 students and the strong group comprised 36 students.

All the participants were tested in L1 skills, and knowledge of EFL letter sounds and names at the beginning of fourth grade. The schools were chosen using convenience sampling because they started teaching English in fourth grade, taught four hours of English a week and according to the same method.

The students selected for participation were those who had not previously studied English in a formal setting, did not come from English-speaking homes, and had not lived in an English-speaking country for any length of time. All participants in the study were native speakers of Hebrew and were able to read Hebrew. All students whose parents signed the consent form and who fit the above criteria were included in the research.

The mean age of the participants at the beginning of testing was 9 years and 5 months, and at the end of the testing, 10 years and 1 month. There were 61 boys and 84 girls who participated in the study. The 145 students were selected from eight different classes taught by four different English teachers using a balanced approach that combined emphasis on the development of spoken language using a communicative approach, together with a phonics approach for acquiring EFL reading and writing.

The three schools included children from different socioeconomic backgrounds. Socioeconomic status was determined by the neighborhood in which the children lived. In 2001, the socioeconomic status of different areas in Israel was determined by the Israeli Central Bureau of Statistics that was commissioned by the Israeli Ministry of Interior to determine priorities for distribution of benefits (Central Bureau of Statistics, http://www.cbs.gov.il/locals.htm). Municipal areas were classified according to an index that included demographic, parent education, standard of living, employment and unemployment data, and percentage of the population receiving government subsidized benefits. Areas were divided into groups numbered from 1 to 10, with 1 representing the lowest and 10 representing the highest SES levels. Of the schools that participated in the research, one is a secular public school in a rural area in the lower Galilee (98 students) that received a score of 6 according to socioeconomic ranking; one is a secular public school in a northern coastal city (16 students) that received a score of 4 according to socioeconomic ranking; and one is a semiprivate, religious school in a lower Galilee town (31 students) that also received a score of 4 according to socioeconomic ranking. All students in a given school were, therefore, given the same SES score (i.e., either 4 or 6) depending on the school.

MEASURES

L1 Measures. Students were tested on L1 reading related skills at the beginning of their first year of English reading instruction. These independent measures included:

1. Hebrew (L1) phonological awareness tested by the Ben-Dror/Shany phoneme deletion task (Shany, Zeiger, & Ravid, 2001). The phoneme deletion task consists of 20 one- and two-syllable words presented orally to the participants after five trials at the beginning of the task. All items were completed by participants. They were asked to repeat a word after the tester and they then repeated it again while deleting either beginning, final, or medial target phonemes, which resulted in the production of a nonword. For example, the student was asked to say *dvaš* (Hebrew for "honey"). The student was then asked to say *dvaš* without the /d/. The required answer would be: *vaš* (a nonword). A Cronbach Alpha that tested for internal consistency among the 20 items yielded 0.82. The expected score ranged between 0 and 20.

2. Hebrew (L1) morphological awareness was tested with the Ben-Dror/Shany morphological processing production task (Ben-Dror, Bentin, & Frost, 1995). This task consists of five trial items and 15 test items. The tester pronounced the root of a word followed by a sentence with a deleted word. Participants were required to fill in the deleted word of the sentence that was morphologically related to the root of the word. For example, the tester pronounced the root word *rakad* (Hebrew for "dance"). After that, the tester presented the sentence *"Ha'iš šehofi'a al habama hu ha'_____"* (Hebrew for "The man that performed on the stage is the _____."). The participant had to fill in *rakdan* (Hebrew for "dancer"). The expected accuracy score for each participant ranged between 0 and15.

3. Hebrew (L1) spelling was tested by an informal spelling measure that consisted of two parts. The first part comprised 14 single words, and the second part comprised two sentences consisting of five and six words that were dictated to students who were required to write them. The single words were dictated within the context of a sentence in order to control for ambiguity. Participants heard the contextual sentence but only had to write the target words. The second part involved writing the two sentences (consisting of five and six words) in their entirety. All words contained sounds that could be represented by more than one letter (e. g., *tsavar*, Hebrew for "neck"). This word was given in the context of the sentence, *"Le-jirafa yeš tsavar arox"* (Hebrew for "The giraffe has a long neck"). One point was allotted for each target word spelled accurately and one point was given for each word spelled accurately within the two sentences, making a potential total score of 25. The expected score ranged between 0 and 25.

4. Hebrew (L1) word reading consisted of three measures that were highly correlated and tapped the same underlying construct. The first measure was a nonstandardized word recognition measure (Balgur, 1977) consisting of 20 frequent fourth grade level vowelized words. The words were presented in two columns of 10 words each on a single A4 size white cardboard with enlarged font size. Participants read each word aloud. The expected score ranged between 0 and 20.

The second measure was an informal 20 item pseudoword task (e.g., *"zaši"*, *"šer"*, *"vasug"*) (Greenbaum & Lichter, 1996). These vowelized pseudowords consisted of six one-syllable, 11 two-syllable, and three three-syllable pseudowords. The words were presented in two columns of 10 words each on a single A4 size white cardboard with enlarged font size. Participants read each word aloud. The expected score ranged between 0 and 20. A Cronbach Alpha that tested for internal consistency among the 20 items yielded a score of 0.81. The word recognition and pseudoword reading tasks were combined based on their correlation ($r = .69$; $p < .01$). Tasks were combined by calculating the arithmetic means of their z scores.

The third measure that formed the Hebrew (L1) word reading cluster was a list of 210 unvowelized Hebrew words adapted from the Balgur Word Reading Measure (Balgur, 1977). Participants read the words aloud as fast and as accurately as they could. Elimination of vowels in the Hebrew orthography sometimes results in words that can be pronounced in more than one way (in this task, 24 out of the 210 words). Any correct pronunciation was accepted (e.g., *ševa* - Hebrew for "seven", *sava*, Hebrew for "eat one's fill", and *savea*, Hebrew for "satisfied"). A timer was used and participants were given one minute to read the words. The number of words read (Reading Speed) was measured. The expected score for fluency ranged between 0 and 210 words read in one minute. This score was combined with the above composite score based on the high correlation between them ($r = .82$; $p < .01$). The scores were combined by calculating the arithmetic means of two *z* scores, thus creating the Hebrew word reading cluster.

5. Hebrew (L1) vocabulary knowledge was measured by the antonyms and synonyms subtests of the Man measure (Glantz, 1991). Each subtest consisted of 12 items that according to test guidelines, participants should read and respond to. The subtests were combined by calculating the arithmetic means of two *z* scores ($r = .45$; $p < .05$) to create a Hebrew vocabulary knowledge cluster (referred to as Hebrew vocabulary knowl-

edge). These measures were assessed independently of reading skills. Instead of the participant reading the key word silently and finding the antonym or synonym for the word among five options, the tester read the key words and five options to the participant. In order to circumvent short-term memory difficulties, the tester repeated options if the participant did not remember them. The synonyms task was explained as follows: The tester told the participant that he or she would hear (and see) a word followed by five other words. One of the five words would have the same meaning as the target word. Participants were requested to identify the word that was the same as the target word (e.g., *levana*, Hebrew for "moon"), followed by five options (*sefer*, Hebrew for "book", *agala*, Hebrew for "wagon", *koxav*, Hebrew for "star", *yareax*, Hebrew also for "moon", and *kutonet*, Hebrew for "nightie"). The required answer was *yareax*. The expected score ranged between 0 and 12.

The antonyms task and synonyms task were administered in the same manner but participants were told that they should find the word that was the opposite of the target word among the five possibilities (e.g., *yom*, Hebrew for "day" followed by *ša'a*, Hebrew for "hour", *boker*, Hebrew for "morning", *šemeš*, Hebrew for "sun", *et*, Hebrew for "time", and *layla*, Hebrew for "night"). The required answer was *layla*. The expected score ranged between 0 and 12.

EFL MEASURES

Participants were tested on all EFL independent and dependent measures at the end of their first year of English reading instruction. The one exception was that knowledge of EFL letter sounds and names was also tested at the beginning of fourth grade in order to check for individual differences in rudimentary knowledge of English literacy before the onset of EFL instruction.

EFL INDEPENDENT MEASURES

1. English letter knowledge was tested by individually presenting participants with the 26 lower case letters of the English alphabet printed on cards in randomized order. Participants were asked to pronounce the sounds of the letters and to name the letters. The expected score ranged between 0 and 26 for sounds and 0 and 26 for names. These two measures highly correlated with one another ($r = .96$; $p < .01$) and were combined into a single cluster called English letter knowledge.

2. English (FL) vocabulary knowledge consisted of two informal measures. Both measures tested knowledge of words or

sentences with which the students had come into contact in their first year of EFL study. The receptive vocabulary measure consisted of 10 items. For each item the student saw four pictures (e.g., "bicycle", "book", "bat", and "bag"), and was then asked to circle the picture of the target item (e.g. "bag"). The expected score ranged between 0 and 10. The sentence listening comprehension measure consisted of 15 items. For each item, the student saw three pictures (e.g., "The boy is swimming." "The boy has a ball." and "The boy is playing with a toy car."), and was then asked to circle the picture of the target sentence (e.g., "The boy has a ball."). The expected score ranged between 0 and 15. These two tasks which measured English vocabulary knowledge were converted into z scores and their arithmetic means were calculated ($r = .68$; $p < .01$).

EFL DEPENDENT MEASURES

3. English (FL) word reading comprised three measures. The first was a pseudoword task, the Woodcock Reading Mastery Test–Revised, Form H, Word Attack subtest (Woodcock, 1987). The second measure, the Woodcock Reading Mastery Test–Revised, Form H, tested word recognition. Raw scores were used for the Woodcock subtests because this test was normed on an American English-speaking population. The third measure was an informal list of 20 words with which students had come into contact in their first year of EFL study (e.g., cat, ball, mother, happy). The list included all letters of the English alphabet with the exception of d, qu, v, x, and z, common vowel digraphs (e.g., ee, oo), and common consonant digraphs (e.g., ch, th), as well as two irregular words (the, you). The list included one- and two-syllable words that included closed, vowel "r" digraph, and double vowel digraph syllables. Participants read the list aloud and received 1 point for every word decoded accurately. The expected score ranged between 0 and 20. The Woodcock Word Identification and Word Attack were combined into a formal English word reading cluster ($r = .85$; $p < .01$). This z score on the word reading cluster was combined with the converted z score of the informal English reading accuracy measure ($r = .90$; $p < .01$) to create an overall English word reading measure (referred to as English word reading).

4. English (FL) reading comprehension was measured by an informal measure consisting of two texts that were read silently by participants. Each text covered a different topic (a description of a boy, a day at the farm) that participants were

exposed to during their first year of EFL study. Each text was followed by five written multiple-choice questions presented in Hebrew. Participants were required to circle the correct answer. The expected score ranged between 0 and 5 for each text with a total of 10 for the two texts together. The total score was converted into *z* scores. In order to determine whether the levels of the two passages were equivalent, a reliability analysis was conducted on a representative sample of 30 students. Guttman split-half analysis results yielded a reliability estimate of 0.87. A Cronbach Alpha that tested for internal consistency among the items yielded 0.91 for the first five questions (first text) and 0.83 for the second five questions (second text).

PROCEDURE

The L1 and FL group measures (Hebrew spelling, English vocabulary, and reading comprehension) as well as the individual measures (English letter knowledge, phonological and morphological awareness, Hebrew word reading) were all administered by the first investigator. In addition, EFL teachers completed assessments of students' reading at the end of the year. These ratings validated the English reading comprehension informal measures. End of year English teacher evaluations correlated highly with end of year English reading comprehension measures ($r = .60$, $p < .01$).

RESULTS

A multivariate analysis of variance (MANOVA) followed by univariate analyses of variance (ANOVAs) were performed for all measures in order to test for differences between schools differing in SES. The multivariate MANOVA was significant between the groups $F(8, 136) = 9.01$, $p < .00001$. Two-group, one-way ANOVAs found significant differences between the schools for Hebrew phonological awareness $F(1, 143) = 10.11$, $p < .01$, Hebrew morphological awareness $F(1, 143) = 10.53$, $p < .01$, Hebrew spelling $F(1, 143) = 6.57$, $p < .05$ in favor of the low SES group, Hebrew vocabulary knowledge $F(1, 143) = 6.16$, $p < .05$, end of year English letter knowledge $F(1, 143) = 5.02$, $p < .05$, English vocabulary knowledge $F(1, 143) = 22.00$, $p < .01$, English word reading $F(1, 143) = 17.66$, $p < .01$, and English reading comprehension $F(1, 143) = 4.19$, $p < .05$ (see table I).

Stepwise discriminant function analyses examined which Hebrew L1 and EFL predictor variables differentiated weak and

Table I. Means and Standard Deviations of L1 and EFL Measures by Socioeconomic Status (SES) 6 (Relatively High) versus 4 (Relatively Low) by the Israeli Central Bureau of Statistics SES scale[a]

Language/Reading Measures (Range)	Students (n = 96) from Relatively High (6) SES Schools		Students (n = 49) from Relatively Low (4) SES Schools	
Independent Variables	**M**	**SD**	**M**	**SD**
Hebrew phonological awareness (0-20)	11.51	3.96	9.41	3.34
Hebrew spelling (0-25)	18.21	4.44	20.08	3.56
Hebrew morphological awareness (0-15)	10.10	2.37	8.65	2.87
Hebrew vocabulary knowledge (0-12)	9.30	1.51	8.58	1.87
Hebrew word reading (z score)	0.02	0.74	-0.03	0.86
Beginning of year English letters (0-26)	8.74	10.08	10.54	9.43
End of year English letters (0-26)	20.32	5.84	18.06	5.61
English vocabulary knowledge (z score)	0.24	0.80	-0.47	0.95
Dependent Variables	**M**	**SD**	**M**	**SD**
English word reading (z score)	0.22	1.00	-0.45	0.68
English reading comprehension (z score)	0.12	1.04	-0.24	0.87

[a] 1 represents the lowest SES ranking and 10 the highest SES ranking

strong EFL readers. In addition, the discriminant analyses examined whether the SES factor differentiated weak and strong EFL readers. The SES variable was nominal (with values of either 4 or 6) and was, therefore, defined as a dummy variable in the stepwise discriminant analysis. Forward stepwise discriminant analyses were used so that only variables that contributed substantially to discriminating the groups were entered.

Stepwise discriminant analyses using Wilks' Lambda tested the extent to which L1 Hebrew measures, English vocabulary knowledge, and English letter knowledge, in addition to SES as a dummy variable, differentiated between the groups (strong versus weak EFL readers in the present research) (Kinnear & Gray, 2000). Each analysis produced one discriminant function.

The discriminant function consisted of a combination of the independent variables (table II) that most significantly differentiated between strong and weak EFL readers.

Each stepwise discriminant analysis classified different children as being weak or strong EFL readers, depending on their results on the reading comprehension measure or English word reading. In order to check for overlap between the two parallel groups of weak word readers and students who were weak at EFL comprehension as opposed to strong word readers and students who were strong at EFL reading comprehension, a chi square test for correlations among two dichotomous variables resulted as follows: out of 27 weak word readers, 23 students were also weak at English reading comprehension. Out of 23 strong word readers, 19 were also strong at EFL reading comprehension, $\chi^2_{(1)} = 36.62$, $p = .001$. $\Phi = .912$.

The first stepwise discriminant analysis model based on English word reading (see table II) correctly classified 98% membership of weak as opposed to strong readers. The following variable scores were entered into the stepwise discriminant analysis: word reading, vocabulary knowledge, phonological and morphological awareness, spelling (all measured in Hebrew), end of year English letter knowledge, English vocabulary knowledge, and SES. Of these eight variables, the following three variables comprised the discriminant function: English letter knowledge, Hebrew vocabulary knowledge, and SES (see table II). Group centroids (group means on the discriminant function) were significantly different (weak EFL readers = -2.21 versus strong EFL readers = 2.60, Wilks' Lambda = .143, $\chi^2_3 = 90.34$, $p < .0001$).

Due to the strength of English letter knowledge in differentiating strong and weak EFL readers, and in order to examine the differentiating ability of L1 Hebrew measures, we repeated the same analysis without entering English letter knowledge as one of the independent variables. Of the seven variables, three variables entered the discriminant analysis in the following order: Hebrew vocabulary knowledge, English vocabulary knowledge, and Hebrew word reading. Group centroids were significantly different (weak EFL readers = -1.37 versus strong EFL readers = 1.61, Wilks' Lambda = .303, $\chi^2_3 = 55.47$, $p < .0001$). This stepwise discriminant analysis correctly classified 94% membership of weak as opposed to strong readers. Without English letter knowledge, the discriminant function consisted of a combination of English and Hebrew vocabulary knowledge as well as Hebrew word reading. Here, Hebrew L1

Table II. Stepwise Discriminant Analyses Differentiating Weak and Strong EFL Readers.

EFL Word Reading as Dependent Variable	Differentiating variables[a]	Standard canonical function coefficients	Wilks' Lambda after entry	df	*F*
1) With EFL letter knowledge					
	EFL letter knowledge	.95	.24	1, 48	156.68**
	SES	.64	.16	2, 47	126.39**
	Hebrew vocabulary	.32	.14	3, 46	91.66**
2) Without EFL letter knowledge					
	Hebrew vocabulary	.49	.47	1, 48	54.71**
	English vocabulary	.55	.36	2, 47	41.98**
	Hebrew word reading	.49	.30	3, 46	35.21**
EFL Reading Comprehension as Dependent Variable					
3) With EFL letter knowledge					
	EFL letter knowledge	.46	.64	1, 104	59.62**
	Hebrew word reading	.45	.54	2, 103	44.48**
	English vocabulary	.41	.49	3, 102	35.31**
	Phonological awareness	.30	.47	4, 101	28.65**
4) Without EFL letter knowledge					
	Hebrew word reading	.59	.68	1, 104	48.91**
	English vocabulary	.57	.56	2, 103	40.15**
	Phonological awareness	.41	.52	3, 102	31.32**

[a] Variables are listed in the order they entered with their associated Wilks' Lambda statistic and classification function coefficients.

**$p < .001$

linguistic and literacy measures played a larger role in characterizing weak readers, and SES was not part of the discriminating function.

The third stepwise discriminant analysis model was based on the English reading comprehension composite score (see table II) and correctly classified 89.6% membership of weak as opposed to strong readers. The same eight variables that were candidates for the first stepwise discriminant analysis model were entered into this model (word reading, vocabulary knowledge, phonological and morphological awareness, spelling [all measured in Hebrew], English letter knowledge, English vocabulary knowledge, and SES). Of these eight variables, four variables entered the discriminant analysis in following order: English letter knowledge, Hebrew word reading, English vocabulary knowledge, and phonological awareness (measured in Hebrew). SES was not part of the discriminant function. Group centroids (group means on the discriminant function) were significantly different (weak EFL readers = -.76 versus strong EFL readers = 1.47, Wilks' Lambda = .469, $\chi^2_4 = 77.34$, $p < .0001$).

We repeated the same analysis without entering English letter knowledge as one of the independent variables. Of the seven variables, three variables entered the discriminant analysis in the following order: Hebrew word reading, English vocabulary knowledge, and phonological awareness (measured in Hebrew). Group centroids (group means on the discriminant function) were significantly different (weak EFL readers = -.68 versus strong EFL readers = 1.33, Wilks' Lambda = .520, $\chi^2_3 = 66.93$, $p < .0001$). This stepwise discriminant analysis correctly classified 82.1% membership of weak as opposed to strong readers. SES was once again not part of the discriminant function.

DISCUSSION

This research examined L1 and EFL linguistic as well as SES differences between relatively weak versus strong beginner EFL readers. The Linguistic Coding Differences Hypothesis (LCDH), which claims that difficulties expressed in L1 linguistic coding will resurface in FL acquisition, received greater support when English letter knowledge was not entered into stepwise discriminant analyses. Poorer performance on L1 Hebrew measures (word reading and vocabulary knowledge) characterized weak EFL readers classified according to English word reading. Poorer Hebrew word reading and phonological awareness

(tested in Hebrew) characterized students who were weaker at English reading comprehension. In both of the above cases, English vocabulary knowledge along with the Hebrew L1 variables were the EFL linguistic skills that differentiated weak and strong EFL readers.

When English letter knowledge was entered into the respective stepwise discriminant analyses, L1 measures played less of a characterizing role in weak EFL reading, and English letter knowledge became a significant differentiator between weak and strong EFL readers. This finding supports L1 reading research in which, together with phonological awareness (in spite of the fact that it was measured in Hebrew in this research), English letter knowledge represents internalization of the alphabetic principle and has been found to have a significant impact on reading acquisition at the end of the first year of reading acquisition (Duncan & Seymour, 2000; Muter & Diethelm, 2001; Scanlon & Vellutino, 1997; Snow, Burns, & Griffin, 1998).

Although results of the MANOVA and subsequent ANOVAs showed significant differences between the two SES groups, these differences became less significant when SES was entered into the stepwise discriminant analyses together with the other L1 Hebrew and EFL linguistic and literacy measures. In this case, SES only appeared once as part of the discriminating function between weak and strong EFL word readers when English letter knowledge was entered. Here, SES, English letter knowledge, and Hebrew vocabulary knowledge differentiated weak and strong EFL word readers. These results support Duncan and Seymour's (2000) findings for L1 literacy acquisition. They found that lower SES elementary students were delayed by a year in knowledge of letter sounds, letter names, and word and nonword reading when compared to their higher SES counterparts. Results of the present stepwise discriminant analysis with English word reading as the dependent variable show that after six months of EFL instruction, weak EFL word readers were characterized by their lower SES background, L1 vocabulary knowledge, and poorer English letter knowledge. These findings support research that suggests that literacy ability may be influenced by social conditions and parental educational priorities (e.g., see Bialystok, 2001). Spolsky (1989) argues that social context shapes attitude toward learning a language as well the opportunities available for language exposure. Various studies mention socioeconomic factors as influencing foreign or second language acquisition (Ministry of Education, Culture, &

Sport, Office of the Chief Scientist, 1999; Olshtain, Shohamy, Kemp, & Chatow, 1990; Skehan, 1986; Spolsky, 1989). Children of middle- and high-socioeconomic backgrounds have a strong sense of the importance of English as a FL for numerous purposes such as future study and international communication in the context of travel and business. Children from lower socioeconomic backgrounds may not be educated with expectations for tertiary education, and international communication and travel may not be a part of their reality. Thus, they may appreciate less the importance of EFL acquisition.

The very partial role of SES in the results of the present study (SES was part of the differential function for EFL word recognition, and this only when EFL letter knowledge was entered, but not EFL comprehension) could be a result of limitations in the SES measure. Use of neighborhood (school) in the present study instead of using individual SES information as a unit of analysis for SES resulted in a rather general dichotomy between the two SES groups. Future studies of this nature should adopt suggestions resulting from Sirin's (2005) meta-analysis, which fully explored the role of SES. These studies could include measuring SES according to individual SES characteristics, constructing SES variables to include home resources measured as a continuum rather than dichotomously.

Hebrew vocabulary knowledge appeared as part of the model differentiating weak and strong EFL word readers whether or not English letter knowledge was entered into the analyses. These results are supported by L1 literature in which readers from low socioeconomic backgrounds were characterized by poorer semantic knowledge (Scanlon & Vellutino, 1997; Stanovich, 1988). As mentioned previously, this finding has not always been supported in the L1 reading acquisition literature (e.g., see Siegel & Ryan, 1984; Vellutino & Scanlon, 1986). However, first language reading literature has found that under particular circumstances, vocabulary tasks have differentiated between strong and weak readers. Older poor readers very often are differentiated from good readers on semantic tasks. Stanovich (1988) explains how young poor readers initially struggle with phonological and orthographic but not with semantic codes of the language. With time, difficulty in the phonological and orthographic codes prevents readers from improving their semantic skills through reading, and so poor semantic skills become a byproduct of poor reading. Thus, to a considerable extent, poor semantic skills are a result and not a cause of poor reading.

English vocabulary knowledge appeared as a differentiator between strong and weak EFL readers for three out of the four stepwise discriminant analyses, regardless of whether English letter knowledge was entered into the analyses. In this study, English vocabulary knowledge was found to differentiate strong and weak elementary school readers in English reading comprehension skill. These findings have been supported by FL research among high school and college students (Laufer, 1995; Nassaji & Geva, 1999; Sparks, Ganschow, & Patton, 1995; Sparks et. al., 1997). English vocabulary knowledge, as well as Hebrew vocabulary knowledge and Hebrew word reading, made up the discriminant function, differentiating strong and weak English word readers when English letter knowledge was not entered into the analysis. The connection between English vocabulary knowledge and English word reading may be explained by the opaque characterization of the English orthography so that at a relatively early stage, word meaning is associated with word reading (see Ehri, 2005) in both the L1 (Nation & Snowling, 2004) and EFL (Leong, Tan, Cheng, & Hau, 2005).

In sum, the LCDH was supported by weak EFL readers being characterized by poorer phonological awareness, word reading, and vocabulary knowledge (all measured in Hebrew). Poorer results for phonological knowledge and Hebrew word reading may be indicative of a language "core" common to both Hebrew and English. Specifically, although the phonological, orthographic, and morphological dimensions of Hebrew are qualitatively different from those of English, these two orthographies may demand similar processing for the purpose of word reading and comprehending texts. Weaker Hebrew vocabulary measures among fourth graders may be a consequence of less reading resulting from poor decoding skills. In this study, SES was found to characterize weak EFL word readers in one case only. These results have implications for screening of students who are at risk for EFL reading success as well as their subsequent instruction.

CONCLUSIONS AND EDUCATIONAL IMPLICATIONS

The results of the present research have several theoretical and applied implications. First, the finding that Hebrew word reading differentiates between strong and weak EFL readers sug-

gests that there is a common word recognition process for both Hebrew and English. The EFL beginning reader who has internalized the English alphabetic principle with ease is the reader who has fluent Hebrew (L1) word reading skills as well as good Hebrew (L1) vocabulary knowledge.

Second, the difficulties of the weak EFL reader in this study may be understood from a cross-linguistic perspective in terms of a concept borrowed from L1 reading research and introduced by Stanovich (1986) called "Matthew Effects" (i.e., the rich get richer and the poor get poorer). These Matthew Effects, whereby those who have stronger reading readiness skills at the start of first grade (i.e., phonological awareness, morphological awareness, knowledge of letter sounds and names), become faster and more accurate readers and then read significantly more words and text, thereby improving their vocabularies. Their greater reading experience causes them to become skilled readers at a much earlier point than children who start first grade with difficulty in phonological and morphological awareness, as well as little knowledge of letter sounds or names. These students also have much greater difficulty understanding the alphabetic principle and acquiring reading. They have unsuccessful, slow, and laborious reading experiences that result in poor text comprehension. Instead of accurate and fluent word decoding skills, they rely on context. Over time, they become less motivated to engage in reading, and the gap between them and their strong reading counterparts becomes wider. In this study with students learning EFL in fourth grade, the upward and downward spirals of the strong and weak readers may have already begun because of their weaker L1 reading skills.

Third, it would be of value early in the first year of FL reading acquisition to ascertain which students have difficulty with Hebrew word recognition and vocabulary knowledge. These students would possibly fall into the at-risk category for EFL reading as well. Early detection and intervention could prevent these readers from falling further behind their strong reader counterparts. Early detection of poor L1 word recognition, phonological awareness, and vocabulary knowledge could also help in identifying at-risk EFL students. The role of SES background adds a further challenge to successful EFL acquisition. Carefully designed instructional programs, including more hours in classes with smaller numbers of students taught by well-trained, experienced EFL teachers in areas with lower SES, could attempt to combat this disadvantage.

ACKNOWLEDGMENTS

The authors wish to thank Zahava Goldstein (Ph.D., University of Haifa) for her insightful comments regarding this paper.

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Manuscript received December 22, 2003.
Final version accepted March 27, 2006.