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THE ROLE OF ORAL LANGUAGE PROFICIENCY IN THE DEVELOPMENT

OF L1 AND L2 BASIC READING SKILLS IN YOUNG CHILDREN

by

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A thesis submitted in conformity with the requirements
for the degree of Master of Arts
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ABSTRACT

The role of oral language proficiency in the development
of L1 and L2 basic reading skills in young children
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The present study examined the relationship between oral language proficiency (OLP), reading comprehension, and basic reading skills (decoding and word recognition) in beginning readers. The participants included children beginning English reading instruction in their native language (L1), and Punjabi immigrant children beginning reading instruction in their second language (L2). The results showed that L1 and L2 children differed in English OLP, but not on reading skill tasks. Further investigation revealed that OLP played a greater role in predicting reading comprehension than in predicting basic reading skills. The results also showed that OLP contributed significantly to the explained variance of L2 basic reading skills, but not to L1. It appears that the L1 children are utilizing analytical skills and the L2 children are utilizing OLP skills, to achieve the same level of performance. The present findings are discussed in the context of Chall's (1996) model of reading development.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1

INTRODUCTION

Due to demographic trends large urban centres are undergoing a great deal of change. By the late 1980s the immigrant population in Canada more than doubled (Cole, 1996), and by the early 1990s seventy-five percent of immigrant children were of school age. Within this population of children, fifty-eight percent were from single-parent homes in low-income situations (Cole, 1996). In some areas of Toronto, Canada's largest metropolitan centre, at least fifty percent of school children are from non-English backgrounds. There is a growing concern as to the suitability of the present educational system to meet the needs of this linguistically and ethnically diverse population, especially in terms of the acquisition of literacy skills. In many of the schools there is an unacceptable level of literacy failure (Willows, 1996). Children from low income and minority language backgrounds are identified as "at-risk populations" for literacy, and general academic failure (Cole, 1996; Snow, 1991; Willows, 1996).

There is a well established literature base in both the fields of psychology and education documenting the development of reading fluency and comprehension of English speaking children learning to read in their first language (L1). These studies stress the importance of two basic reading skills: context free word recognition skills and phonological awareness (Adams, 1990; Stanovich, 1984). These skills repeatedly prove to be strong predictors of successful readers (Adams, 1990; Foorman, 1995). The question that logically ensues, is what skills are important in the acquisition of basic reading skills?

Oral Language Proficiency (OLP) is one of the sets of skills under investigation in

the literature as a potential contributor to basic reading skills. This line of research is based on the assumption that since OLP and reading are both language based processes, then achievement in one should contribute to achievement in the other. While this hypothesis is intuitively appealing, the relationship between OLP and reading skill is more complex.

One of the difficulties experienced when investigating the relationship between reading and OLP, is that neither process represents a single unitary skill. Reading includes a comprehension component, as well as basic skills such as word recognition (using a lexical look-up procedure to identify a word), and decoding (applying grapheme-phoneme conversion rules to identify a word). OLP includes components such as vocabulary (lexical access), syntax (rules of sentence formation), phonology (sound system), and morphology (rules of word formation). Additionally, a discussion of the relationship between these two complex sets of skills must further consider that each skill is dynamic, and thus varies at different developmental stages (Chall, 1989).

OLP and reading skill are both developmental processes (Chall, 1989). As developmental processes, these skills change both quantitatively and qualitatively over time. The mature reader and the mature speaker-hearer are doing something fundamentally different when he or she reads or speaks than the novice. For example, for the beginning reader attention is acutely focused on decoding individual letters and words with less attention to comprehension. For the skilled reader, decoding has become automatized so that attention can be directed towards comprehension (Samuels, 1967b; Samuels & Kamil, 1984).

Chall (1996) has developed a stage model of reading that describes the

qualitative changes in reading development over six stages. The first stage is the *Prereading* stage and spans from birth to around six years of age. During this stage children develop OLP, acquire print concepts (e.g., in English one writes from left to right and from top to bottom), and learn to recognize common signs and words (e.g., the big yellow M says McDonalds). The second stage is the *Initial Reading and Decoding* stage, and encompasses children in grades one through two. During this stage, children's reading focuses on developing the alphabetic principle and learning to decode words they do not immediately recognize. At this level children are reading material that is far below their understanding in oral language situations. In the third stage, *Confirmation, Fluency, and Ungluing from Print* children in grades two and three continue to practise word recognition and decoding skills as they work towards automatization. At this level children are reading materials that are within their realm of real world knowledge, and are approaching their level of linguistic competencies. In stage four, *Reading for Learning the New*, students in grades four to eight refocus their attention from learning to read, to reading to learn. The materials at this level are beyond children's everyday communicative speech and outside of their background knowledge. In stages five and six, critical reading skills develop at the highschool and college level.

The stages of OLP development also show both quantitative and qualitative changes. At an early stage, the young infant learns to make the distinctive phonemic sounds that are the building blocks of speech production (Berko-Gleason & Bernstein-Ratner, 1993). From age one to three the child learns between 1000 and 3000 words, and starts to connect the words in simple sentences (e.g., want cookie, no bed). From

three to five, the toddler learns concepts like rhyming, and basic morphological rules (e.g., one bug, two bugs). From five to eight the child's language becomes increasingly advanced, with the addition of complex phonology and more elaborate syntactic structures. Throughout these stages the child is also learning about the social context of language, for example, turn taking behaviours, humour, and so on (Berko-Gleason & Bernstein-Ratner, 1993).

How does the development of these two sets of skills, OLP and reading, influence one another? From birth to around the age of eight, OLP precedes reading development. After the age of eight, the language in reading materials becomes gradually more advanced than the child's OLP, and reading contributes to the development of OLP (Chall, 1989). The reciprocity of the OLP-reading relationship is illustrated through Chall's developmental stages in reading. When children begin formal reading instruction, the material is generally well below the child's level of OLP. The majority of normal developing beginner readers have all of the necessary resources to approach the reading task. Their focus then is on learning the association between the spoken and the written words. In grades two and three OLP begins to play an increasingly greater role in reading acquisition. The material at this level is more difficult, and a larger vocabulary and more developed syntax facilitate the acquisition of automaticity. From grade four on, reading materials become increasingly more complex and unfamiliar. At this stage, the increased reading of more advanced text begins to contribute to OLP (Chall, 1989). Dale, Crain-Thoreson, & Robinson (1995) provide evidence to confirm Chall's model. In a study looking at the development of reading and OLP in L1 children, Dale et al (1995) show that grade one reading skills are more highly

correlated with non-verbal (e.g. memory for digits) than verbal skills (e.g. vocabulary). They conclude that in the initial decoding stage of reading, a child's reading skills are more related to analytic ability, knowledge of print, and phonological awareness than to verbal skills. However, in subsequent stages of reading development when text comprehension is the focus, reading skills are more closely correlated with general language skills.

Historically, the research literature has focused on reading development in L1 populations and the findings have been used to infer the development of literacy in L2 learners. However, more recently, both researchers and practitioners have found that generalizing L1 findings to L2 learners is problematic. Grosjean (1992) explains that the bilingual learner cannot be viewed as the sum of two monolinguals. Instead one must distinguish the bilingual as a specific speaker-hearer with a unique linguistic configuration. This distinction has led to the realization that there may be fundamental differences between L1 and L2 children who are developing literacy skills. Just as there are qualitative differences between the beginning and the mature reader (Samuels, 1967b; Samuels & Kamil, 1984), there may also be qualitative differences between the L1 and the L2 reader who are the same chronological age. In reference to Chall's (1996) model, in grade one, the L2 child may not have all the necessary resources (e.g., sufficient vocabulary, syntax) to approach the beginning reading task as would the average L1. OLP does not precede reading development for these children. Instead these two sets of skills are developing concurrently. Therefore, based on L1 research, and an acknowledgement of the fundamental differences between L1 and L2 learners, it was hypothesized that at the beginning levels of reading instruction, OLP would play a

more important role for L2 than for the L1 children.

Until recently the bulk of L2 reading research has focused on adult learners. In response to the demographic trends mentioned earlier, recent research has moved towards examining the developing skills of L2 children. To date, there is no comprehensive theory of reading skill development in L2 children. The goal of the present study was to contribute to the developing theory of L2 beginning readers. This was done through an examination of the relationship between L2 OLP and L2 reading development, and a comparison of these relationships in L1 and L2 primary level children.

Learning Conditions

Before reviewing the research literature on OLP and its relationship to reading development a clarification of the definitions of L1 and L2 used in the literature is required. Specifically, the sub-groups within the L2 category (L2/immersion and L2/concurrent) need to be differentiated. The research reported in the present study was based on L1 and L2/immersion participants.

1.   L1 -- Proficient speaker in first (or best) language; school instruction is in the child's first (or best) language. The child is learning to read in L1.

2.   L2/immersion -- Proficient verbal skills in first language; school instruction is in child's L2. The child is learning to speak and to read in L2.

3.   L2/concurrent -- Proficient verbal skills in L1; school instruction is in both L1 and L2. The child is learning to communicate in L2 and to read and write concurrently in both languages.

Oral Language Proficiency

As noted above OLP is a multi-dimensional skill. To be proficient in a particular language requires the individual to show competencies in each of these dimensions. Rice (1989) identifies four major dimensions of OLP including the sound system (phonology), the system of meanings (semantics), the rules of word formation (morphology), and the rules of sentence formation (syntax). In addition to these four dimensions, OLP also includes the ability to understand and use speech appropriately in social contexts (Rice, 1989).

OLP incorporates two components - conversational and academic linguistic skills (Cummins, 1984; Dickinson & Snow, 1987; Ricard & Snow, 1990; Snow, Cancini, Gonzalez, & Shriberg, 1989). Cummins' (1984) reanalysis of Ramsey and Wright's (1974) data of immigrant children in the Toronto school board exemplifies the theoretical importance of this distinction. The data show that while minority language school children achieve a high degree of everyday English communicative ability within two years of exposure, it takes an average of five to seven years to achieve comparable levels of English verbal-academic skills. Cummins' (1984) findings have led to a widely accepted distinction in the literature between Basic Interpersonal Communicative Skills (BICS) and Cognitive Academic Language Proficiency (CALP). The difference between BICS and CALP can be exemplified by examining the role of context in the language situation. BICS refers to language proficiency in everyday communicative contexts. In everyday communication, language is embedded in a context. Participants are active negotiators of the language situation and can provide and receive feedback from other speaker-listeners as to whether the message is being understood. Situational cues,

facial expressions, and body language further aid communication. CALP refers to the manipulation of language in decontextualized academic situations. The language experience is context reduced with linguistic cues providing the main source of meaning. Successful interpretation of the message depends on specific knowledge of the language.

Experimental research exploring the differences between BICS and CALP has confirmed that control over decontextualized language skills requires significantly more time for acquisition than conversational, contextualized skills in L2 learners (Ricard & Snow, 1990). Ricard and Snow (1990) found a significant difference between L1 and L2 children on a decontextualized picture description task. There were no differences between the two groups of children on a corresponding contextualized task. The research also shows that CALP but not BICS relate strongly to success in reading achievement, and that these skills relate increasingly to reading skill with age (Snow et al, 1989). Snow et al (1989) assessed children's ability to give formal oral definitions and how these definitions related to reading skill. They found that decontextualized formal definitions correlated with total reading scores on the California Achievement Test (CAT); while scores on conversational features were negatively correlated with reading.

Ricard and Snow (1990) point out that clinical assessments and research studies often use a single measure to assess OLP, and often do not consider how specific measures affect the assessed proficiency level. The present study used multiple measures to assess OLP. Standardized and experimental tasks were used to assess vocabulary and syntactic skills, and should be considered measures of CALP. A

listening comprehension task was also used as an index of BICS.

Oral Language Proficiency and Reading Development

A limited amount of research exists directly considering OLP and its role in bilingual children's developing reading skills. What has been done is not comprehensive, and has yielded mixed results. To date, the research supports the existence of a positive relationship between OLP and reading comprehension (Clifton & Geva, 1994; Geva & Ryan, 1993; Verhoeven, 1990), but suggests that the relationship to more basic reading skills (e.g., word recognition, decoding) may be less critical (Durgunoglu, Nagy, & Hancin-Bhatt, 1993; Geva, 1998; Geva, Wade-Wooley & Shany, 1997; Gholamain & Geva, in press).

Geva and Ryan (1993) conducted a cross-sectional study with 73 students in grades five to seven, who were learning to read in English (L1) and Hebrew (L2) concurrently. Regression analyses showed that Hebrew oral proficiency, as measured by teachers' global ratings, accounted for 29.8% of the variance on Hebrew reading comprehension scores.

Verhoeven (1990) examined a group of 74 Turkish (L1) speaking children learning to read in Dutch (L2) before the introduction of literacy in their L1 during the first two years of school. Dutch reading comprehension was strongly correlated with Dutch OLP at the end of both grades one and two. Measures of Dutch OLP included both expressive and receptive vocabulary tasks, and an expressive syntactic task. It is reasonable to conclude that there is good evidence to support the notion that L2 OLP in elementary school children and reading comprehension are positively related.

Studies exploring the relationship between OLP and basic reading skills have

focused primarily on word recognition skills. These studies have yielded mixed results and raise the possibility that OLP may not play a crucial role in the development of basic reading skills. In a cross-sectional study, Durgunoglu et al (1993) examined the influence of English (L2) OLP on the English word recognition skills of 31 Spanish (L1) speaking first graders. They did not find a significant correlation between English OLP and English word recognition skills. OLP was measured with listening comprehension, expressive vocabulary, and expressive syntactic subtests of the Language Assessment Scales (pre-LAS). It should be noted that the participants in Durgunoglu et al's (1993) study did not fit into the L2/immersion or L2/concurrent categories as previously defined. Rather, they were in a transitional English-Spanish bilingual program; they received primary instruction in their L1 and were being taught English as a second language. At the time the study was conducted L2 instruction focused on developing OLP, and did not include instruction in L2 literacy.

Other studies have found non-significant or weak significant relationships between basic reading skills and OLP (Geva & Siegel, in press; Geva, Wade-Wolley, and Shany, 1997; Gholamain & Geva, in press). Geva and Siegel (in press) conducted a cross-sectional study with students in grades one to five, who attended a bilingual English-Hebrew. The children were learning to read concurrently in their L1 (English) and L2 (Hebrew). Multiple regression analyses showed that Hebrew OLP, as measured by teachers' ratings, explained 6 to 7% of the variance on Hebrew word recognition and Hebrew word attack (decoding) skills. Gholamain and Geva (in press) used a cross-sectional design to look at bilingual children learning to read concurrently in English (L1), and Persian (L2). Multiple regression analyses showed that Persian OLP, as measured

by teachers ratings on a 7 point scale, made a small but significant contribution to basic reading skill scores. Specifically, OLP contributed to 3% of word recognition and 4% to word attack.

Other studies, however, have found a significant relationship. Verhoeven's (1990) study examined Turkish (L1) speaking children being instructed in Dutch (L2) in the primary grades. Verhoeven (1990) reports a positive significant relationship (p< .05) between Dutch OLP and Dutch word recognition skills. Specifically, Verhoeven (1990) found that at the end of grade one Dutch OLP, as measured by an expressive syntactic task, significantly correlated with Dutch word recognition. However, OLP, as measured by expressive and receptive vocabulary measures, did not correlate with word recognition. At the end of grade two all measures of OLP correlated significantly with word recognition skills.

The studies examining the relationship between OLP and basic reading skills do not yield consistent results as do the studies focusing on reading comprehension. However, the relationship should not be dismissed due to these inconsistencies but further examined. The above studies were conducted with different age groups, different language groups, under different learning conditions (L2/immersion and L2/concurrent), using different experimental designs, and using different measures for assessing OLP (e.g., vocabulary, listening comprehension, global teachers ratings). The question of whether oral language and basic reading skills are related should not be a simple 'yes' or 'no' proposition, but should be considered within the context of the language development of the learner (L1 or L2) and within language groups at particular developmental stages. In terms of Chall's (1996) model of reading development, OLP

does not play a critical role in the development of beginning reading skills. OLP increases in importance with time, as the level of language in age appropriate reading materials begin to surpass oral language competencies. This may not be the case for the L2 learner whose OLP may be equal to or below the language in beginning reading materials.

THE PRESENT STUDY

The present study examined the relationship between English oral language skills (receptive and expressive vocabulary, receptive and expressive syntactic skills, and listening comprehension) and English reading skills (reading comprehension, word recognition, and decoding). The study looked at whether these two sets of skills were related, and how the relationship differed for L1 and L2 beginning readers. It also examined how other variables, such as time, and the nature of the measures used might influence the relationship between OLP and reading skills.

The groups in this study included children beginning English reading instruction in their native language (L1), and Punjabi immigrant children beginning English reading instruction in their second language (L2). The children were tested in the fall (T1) and spring (T2) of the first grade, and the fall (T3) of the second grade.

Research Questions

1. Do L1 and L2 children differ in English OLP as measured by receptive and expressive vocabulary, receptive and expressive syntactic skills, and listening comprehension?

2. Do L1 and L2 children differ in reading skills as measured by reading comprehension and basic reading skills (decoding and word recognition)?

3. Do OLP measures correlate with reading measures? Is the relationship (or lack

thereof) between oral language measures and reading skill measures similar for the two groups (L1, L2), or is the pattern of relationships different?

4. Does the relationship between oral language and reading skills for each group remain stable, or change over time?

5. Does OLP predict reading comprehension and basic reading skills?

Chapter 2

METHOD

Participants

The L2 group consisted of 78 children, who spoke Punjabi as their first language. Children in this group, referred to as the L2 group, came to grade 1 with a varying range of ESL (English as a second language) proficiency. The mean age of the L2 group was 6:3 in T1, with ages ranging from 5:8 to 6:8.

The comparison group comprised 39 children, who spoke English as their L1. Children in this group, referred to as the L1 group, had a mean age of 6:3 in T1, with ages ranging from 5:9 to 6:9.

The participants attended one of four public schools in a lower middle class suburb of Toronto. Literacy instruction in the classrooms incorporated a balance of instructional approaches, including direct instruction of spelling-sound correspondences. Many of the participating teachers have had additional teacher training in literacy instruction as part of "The Balanced and Flexible Literacy Diet" - a program presently being implemented in many schools in the greater Toronto area. The literacy diet breaks away from the traditional literacy wars (whole language vs. phonics) which dominate many beginning reading and teacher training programs. Teachers are trained

to deliver balanced programming with attention to oral language development, basic reading skills, as well as literature appreciation (Willows, 1996).

Only children with parental consent participated in the study. Consent forms were sent out in English and in Punjabi to the families of second language learners.

Procedure

The present paper comprised a sub-study within the context of a larger three year longitudinal project assessing the development of OLP and literacy skills of L2 children. The paper focuses on data collected in the fall (T1) and spring (T2) of first grade, and fall (T3) of the second grade. As part of the larger project children were tested on a variety of experimental and standardized measures assessing various aspects of OLP and reading. The children were seen individually four times in T1 for sessions lasting a half-hour each, and five half-hour sessions in T2 and T3. The measures pertinent to the present study are discussed below. Children were tested individually, in a quiet setting, by graduate students in psychology or education.

Measures

Oral Language measures

a) Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981). This is a measure of receptive vocabulary. The child is shown four pictures on a page (e.g., "dog", "brush", "chair", "car") and is then asked to point to one item (e.g., "can you point to the picture of a chair"). The test consists of 175 items of increasing difficulty. The test is discontinued when the child responds incorrectly to six items in a block of eight questions.

b) Expressive One Word Picture Vocabulary Test (EOWPT) (Gardner, 1990).

This is a measure of expressive vocabulary. The child is shown a picture (e.g., "bus") and is then asked, "can you tell me what this is a picture of". The test consists of 100 items of increasing difficulty. The test is discontinued when the child responds incorrectly to six consecutive items.

c) Grammatical Judgement. This is a 40 item measure of receptive syntactic ability adapted from Johnson and Newport (1989).[1] The child listens to pre-recorded taped sentences which are either grammatically correct (e.g., "We ate the whole pizza by ourselves") or incorrect (e.g., "January is the most cold month of the year"). Each sentence is played twice, and the child is asked to indicate whether the sentence is said "the right way" or "the wrong way". There is no discontinue rule on this test, and the children complete all items.

d) Sentence Repetition. A 40 item measure of expressive syntactic ability adapted from Johnson and Newport (1989) was used.[1] The child listens to pre-recorded taped sentences varying in grammatical properties (e.g., tense correspondence, number) and is asked to repeat each sentence just as he or she heard it. Each sentence is played only once. For example, "The boy caught the ball"; "Mary opens the windows in her room every night". There is no discontinue rule on this test, and the children complete all items.

In order to make the receptive and expressive tasks of comparable difficulty, the grammatically correct versions of the items used in the grammatical judgement task in T1 became the items in the sentence repetition task in T2. The items used in sentence repetition T1 became the items for grammatical judgement T2, with the addition of the appropriate grammatical rule violations. In T3, the two versions of the test were again

reversed.

e) Listening comprehension. This is a measure of the child's listening comprehension. The test is comprised of three short stories (about a paragraph in length) which are read aloud to the child. The child is instructed to pay attention while the experimenter reads the story because he/she will be asked questions about the story. The stories were adapted from the Durrell Analysis of Reading Difficulty (Durrell, 1970).

The analyses for listening comprehension were based on two of the three stories, which were administered to the children. T1 began with a very simple story and moved to a medium and difficult level. In T2 and T3 the medium level story in T1 became the basic story, the difficult story in T1 became the medium level story, and a new story of increasing difficulty was added. In other words, only two story levels consistently appeared in T1, T2, and T3. The questions and scoring procedure were developed by Merbaum (1998). The children's answers were transcribed by the graduate students administering the tests and scored by two native English speaking raters. Each story had a maximum score of 13, consisting of a free recall component, four factual and one inferential question. For the free recall component children were given one point for each idea unit recalled. One point was also given for each correctly answered question. The total score for the two stories was 26.

Reading Skill Measures

a) Word recognition subtest of the Wide Range Achievement Test -Revised (WRAT-R) (Jastek & Wilkinson, 1984). This is a measure of context free word recognition skill. The child is asked to read a list of 42 isolated words. The list starts with

simple words (e.g., "in", "cat", "book") and progresses to more difficult words (e.g., "stretch", "horizon", and "itinerary). The test is terminated when a child responds incorrectly to ten consecutive items.

b) Word Attack subtest of the Woodcock-Johnson (Woodcock, 1987). This is a measure of the child's decoding skills. The child is asked to read pronounceable non-words (e.g., "ift", "mancingful") which can be decoded by using English grapheme-phoneme conversion rules. The test consists of 45 items, and is terminated when the child makes six consecutive errors.

c) Reading Comprehension. This is a measure of the child's reading comprehension. The test is comprised of three short stories (about a paragraph in length) of increasing difficulty which the child is asked to read aloud. The child is instructed to pay close attention to the stories as he/she is reading, because he/she will be asked questions about the story. The child is not provided with any assistance while reading. When the story is complete the child is asked to retell the story. This is followed by four factual and one inferential question related to the story. Each of the three stories has a score out of thirteen. The stories were adapted from the Durrell Analysis of Reading Difficulty (Durrell, 1970).

The analyses for reading comprehension were based on the three stories which were of similar levels of difficulty in T2 and T3. The scoring procedure was the same as for listening comprehension (Merbaum, 1998). The total score for the three stories was 39.

The stories used in the listening comprehension task in T1 became the stories used in the reading comprehension task in T2. Similarly, the stories in the listening

comprehension task in T2 became the stories for reading comprehension T3. Reading comprehension was administered in T2 and T3 only. It was believed that reading comprehension was too difficult a task to administer at T1 and would have overtaxed and frustrated the children.

Chapter 3

RESULTS

Analyses were based on 31 participants in the L1 group and 63 participants in the L2 group. Four subjects in the L1 group were excluded from analyses because they had English as a second dialect (ESD). Twenty-one subjects were excluded from data analysis due to attrition and missing data.

In order to avoid bias associated with standardized tests normed on L1 populations, test scores were not converted to percentiles or standard scores. Instead all analyses, for both standardized and experimental tasks, were based on raw scores.

Do L1 and L2 children differ in English OLP?

Table 1 provides the means and standard deviations of the OLP and reading skill measures for L1 and L2 participants in T1, T2, and T3. As expected the L1 children were more proficient in English OLP than the L2 children. A test of the between-subjects effects of a multivariate analysis of variance (MANOVA) showed significant differences at $p < .001$ between L1 and L2 groups for each OLP measure.

Insert Table 1 about here

Do L1 and L2 children differ in reading skills?

Unlike the results on the OLP measures, the L1-L2 scores on the reading skill

measures did not differ significantly. The between-subjects effect of a second MANOVA did not show a significant difference in the overall performance of the two groups. In summary, the L1 and L2 groups differed on all OLP indices but not on reading comprehension or basic reading skill measures.

Do OLP measures correlate with reading measures, and do the relationships differ for L1 and L2 groups?

Correlational analyses were performed to examine the relationship between OLP and reading skills. For these analyses the two vocabulary scores (receptive and expressive) were combined to create one vocabulary score for each participant. This transformation was performed because a factor analysis found both vocabulary measures to have high loadings on the same factor. Factor loadings were lower for the two syntactic measures and therefore these two measures were kept separate.

Table 2 summarizes the inter-correlation matrix of OLP and basic reading skill measures for L1 and L2 children at T1. Tables 3 and 4 provide the inter-correlation matrices of OLP, reading comprehension, and basic reading skill measures for L1 and L2 children at T2 and T3, respectively.

Insert Tables 2, 3, 4 about here

Consistent with the literature, the analyses showed a positive and significant relationship between reading comprehension and OLP. For L1 children, reading comprehension scores were positively and significantly correlated with vocabulary, grammatical judgement, and sentence repetition in T2, and syntactic skill and listening comprehension in T3. For the L2 children, reading comprehension correlated with all

OLP measures in T2 and T3.

Also consistent with the literature, the relationship between OLP and basic reading skills was found to be more variable. For the L1 children in T1, there were no positive significant correlations between OLP and the basic reading skill measures. There was however, a significant negative correlation between listening comprehension (a measure of BICS), and word attack, $r = -0.364$, $p<.05$. In T2, only grammatical judgement and word recognition were correlated, $r = 0.371$, $p<.05$. The correlation between listening comprehension and word attack was still negative, but no longer significant. In T3, grammatical judgement was correlated with both word attack and word recognition.

On the other hand, for the L2 children in T1, there were positive, significant correlations for both vocabulary and sentence repetition with word attack and word recognition. In T2, all OLP measures correlated significantly with the two basic reading skills. In T3, all OLP measures, except listening comprehension, correlated with reading skills, as well.

In summary, reading comprehension and OLP measures were significantly correlated for both L1 and L2 children. There were few significant correlations among oral and basic reading measures for the L1 group. However, there were significant correlations among almost all OLP and basic reading skill measures for the L2 group.

Does OLP predict basic reading skills?

A series of hierarchical regressions were performed to look at the explanatory power of OLP in predicting reading skills. Due to the relative dearth of research in the prediction of L2 reading skills an exploratory approach was adopted, rather than

prescribing a predetermined order of entry of the variables into the regression equation. In this manner, the independent variables were entered in different orders in an effort to discover the most informative method.

The first set of analyses focused on the contribution of time, native language (L1-L2), and the interaction between time and native language for each of the dependent variables - reading comprehension, word attack, and word recognition. The results of two of the entry orders for each of the dependent variables are presented in Table 5. It is important to note that because the data were longitudinal, the time variable had to be entered into the word recognition and word attack models as two separate contrasts. The first time contrast (TC1) focused on the difference between T1 and T2, and the second time contrast (TC2) on the difference between T3 and the combined effect of T1 and T2. For reading comprehension the time variable focused on the difference between T2 and T3 only and will be referred to as time contrast three (TC3).

Insert Table 5 about here

The results showed that time made a small but significant contribution to the prediction of reading comprehension, explaining 3% of the variance. Time had a larger impact on the prediction of basic reading skills. Time made a significant contribution to both word attack and word recognition, predicting 12% and 22% of the variance respectively. A further breakdown of this analysis showed that for word attack, TC1 (the difference between T1 and T2) and TC2 (the difference between T3 and T1-T2), each contributed 6% to the regression equation. For word recognition, TC1 contributed 10%, and TC2 contributed 12% to the explained variance. The effect of native language and

the interaction between time and native language were not significant for any of the dependent variables. Changes in the order of entry into the model did not change the results.

The next series of regressions, summarized in Table 6, 7, and 8 added the OLP measures to the models. In each of the models time and native language were entered as a single block in Step 1. Native language could not be removed from the model even though it was not a significant predictor, because of the interactions between native language and OLP measures that were entered in Step 6. However, the interaction between time and native language was dropped from the model. In Steps 2 through 5, vocabulary, grammatical judgement, sentence repetition, and listening comprehension were entered independently in a variety of entry orders. In Step 6, the interactions between OLP components and native language were entered in a single block. The interaction terms were always entered into the model last because main effects had to be accounted for before the interactions could be interpreted.

Insert Tables 6,7,8 about here

The results show that altogether, the entire model explained 34% of the variance on reading comprehension, 41% of the variance on word attack, and 34% of the variance on word recognition. Within each model, the combined OLP measures predicted about 30% of the variance on reading comprehension, 18% of word attack, and 16% of word recognition. The interaction between native language and OLP was not significant for reading comprehension, but predicted 4% of the variance on word attack, and 3% of word recognition, after all other effects had been accounted for.

Also of interest within the regression analyses was how the order of entry of the OLP measures altered the significance of their contribution. Listening comprehension contributed 12% to the prediction of reading comprehension when it was entered as the first OLP measure, and remained significant, contributing an additional 2%, in the final OLP position after all other measures had been accounted for. Listening comprehension did not contribute to either word attack or word recognition. Therefore, listening comprehension was entered into the word attack and word recognition models in Step 2 (the first OLP measure) because it was not a significant predictor in this position for either of the basic reading skill measures. Listening comprehension remained in Step 2 rather than being removed from the model because the interaction between listening comprehension and native language did contribute to the total interaction term entered in Step 6.

It is noteworthy that for all three models, reading comprehension, word attack, and word recognition, grammatical judgement was significant in Step 5 (the final OLP position in the model). That is, this measure made a significant contribution to each model after all other OLP measures had been accounted for. Vocabulary made a significant contribution when it was entered in Step 5 for both word attack and word recognition, but not for reading comprehension. Sentence repetition made a significant contribution in Step 4, following grammatical judgement, and in Step 4, following vocabulary for each model. Sentence repetition was not significant, however, when entered in Step 5, after both grammatical judgement and vocabulary had already been accounted for.

In summary, the regression analyses showed that OLP measures made a significant contribution to all three reading skills. The contribution of OLP to reading

comprehension did not differ for L1 and L2 children. However, the significant interaction terms in the basic reading skill models reveal differences in the contribution of OLP to these skills for L1 and L2 children. The results further showed that overall, of the four OLP measures, grammatical judgement and vocabulary each made independent contributions to the regression equation. However, variance on sentence repetition scores were accounted for by the combined effects of grammatical judgement and vocabulary. Listening comprehension was significant for reading comprehension, but not for word attack and word recognition, even when it was entered prior to the other OLP measures.

Chapter 4

DISCUSSION

As expected, L1 and L2 children differed in English OLP, with the L1 children outperforming the L2 children on all OLP measures. This finding, while not surprising, confirms that the sample of participants in the study consisted of two distinct language proficiency groups. In spite of differences found in children's OLP, there were no differences in the mean scores on the reading skill measures. The L1 and L2 children performed similarly on measures of reading comprehension, word attack, and word recognition. These findings might suggest that OLP does not play a significant role in the development of reading skills, or that alternatively, although the children are developing parallel reading skills, OLP is differentially affecting these scores.

To further investigate these options, correlational analyses were performed. While these analyses revealed positive, significant correlations between OLP and reading comprehension for both L1 and L2 children, the correlations for the L2 group

were stronger and more consistent. The analyses of the basic reading skill measures showed that for the L1 group there were few positive, significant correlations between OLP and basic reading skills across all three time periods. Only grammatical judgement was found to be positively correlated with word attack in T2 and both reading measures in T3. For the L2 group, on the other hand, almost all OLP measures were positively and significantly correlated with both basic reading measures across all three time periods. Listening comprehension was less consistent, showing significance in T2, but not in T1 or T3.

The finding that listening comprehension, a conversational (BICS) language skill, correlated with reading comprehension (a contextualized task), does not confirm previous research findings. Snow et al (1989) found decontextualized (CALP) language skills, but not BICS to relate significantly to success in comprehension based reading tasks. A possible explanation for the discrepancy between these two findings entails a consideration of the nature of the specific tasks used. Snow et al (1989) used total reading scores on the CAT, which consists of a combination of both reading comprehension and basic skills, while the finding in the present study was based on reading comprehension alone. The results of the present study, however, did show that listening comprehension had few significant correlations with basic reading measures. The negative, significant correlation found between listening comprehension and word attack in the L1 group, while difficult to interpret, is also not surprising. Snow et al (1989) found a negative correlation between conversational language features and total reading scores on the California Achievement Test (CAT).

As for the general pattern of correlations among the CALP (vocabulary,

grammatical judgement, and sentence repetition) and reading measures, these findings fit well with Chall's (1996) model of reading development. Recall that in Chall's (1996) model the beginning L1 reader has all the necessary language tools to approach the beginning reading task. For example, the child's oral vocabulary well exceeds the vocabulary found in beginning reading texts. As development proceeds, the language and content of the reading material begin to parallel the child's language development. At this point, OLP begins to relate more significantly to reading development.

In the present study, there were few significant correlations between OLP and L1 reading skill at this beginning stage of reading development. Clearly, there was variability in OLP and variability in reading skill in the L1 group, but variance in one skill was not related to variance in the other. In other words, even though there was variability in OLP, all the children have presumably surpassed the necessary language requirement to approach a beginning reading task. For the L2 group, OLP and basic reading skills were correlated. In reference to Chall's (1996) model, it is clear that this group of children do not have all the necessary language skills to approach the task. Consequently, how the children perform on OLP measures is differentiating how they perform on reading tasks.

Of further interest in the present study is the extent to which OLP can predict scores on reading skill measures, and whether the relationship changes over time for each of the two groups. Time and OLP (as measured by the combination of vocabulary, syntactic skill , and listening comprehension) both contributed to the prediction of reading comprehension scores. Furthermore, time, combined OLP (excluding listening comprehension), and the interaction between OLP and native language, were each

significant predictors of both basic reading skill measures. Note however that OLP played a more significant role in predicting reading comprehension than in predicting basic reading skills. The significant effect of time for each of the dependent variables shows that both groups are improving their reading skills over time. The greater effect of time for word attack and word recognition than for reading comprehension coincides with the increased focus on basic reading skills in the early primary grades. It is also likely that the increase in scores on all three dependent variables is due both to improvement due to instruction and maturation, but perhaps also to familiarity with the testing experience and the measures used. The fact that there is no interaction between time and native language for the reading skill measures indicates that both groups were making equal progress over time. This result is very encouraging. As mentioned previously, the teachers at the participating schools have been involved in a special training program called the Literacy Diet aimed at teaching balanced literacy programming (Willows, 1996). These findings suggest that with quality teaching and programming all the students are profiting from their literacy training, regardless of language background.

The results also show that OLP makes a significant contribution to both reading comprehension and basic reading skills. This finding confirms previous research concerning reading comprehension, and adds further evidence to the literature base on basic reading skills and OLP which has shown more variability. The finding of primary interest, however, is the interaction between OLP and native language for basic reading skills. This finding suggests that the relationship between OLP and basic reading skills differs depending on whether the children have English as their first or second language.

Therefore, even though both the L1 and L2 children are achieving similar scores on the basic reading measures, how OLP is related to basic reading skills differs for the two groups. It appears that in congruence with the findings of Chall (1996) and Dale et al (1995) the L1 children, whose OLP exceeds the language in beginning reading material, are utilizing their analytic skills to develop their word recognition and decoding skills. The L2 children, on the other hand, are in the process of actively developing their OLP skills. These children are capitalizing on the overlap in the two language based tasks, and are utilizing OLP in the development of word recognition and decoding skills. Therefore, the two groups of children are relying to some extent on different sets of skills to achieve the same outcome on the basic reading skill tasks. On the other hand, there is no interaction between OLP and native language for reading comprehension. This finding also fits well with the proposed explanation. Reading comprehension is a contextualized task. It is not surprising that the L1 children would not approach this task on a purely analytical basis. Instead, it would be expected that a combination of both OLP and analytical skills would be needed to approach this task.

The regression analyses also reveal some interesting findings about the specific tests being used as measures of OLP. Recall that Ricard and Snow (1990) caution of a danger in using a single measure to assess OLP, pointing out that specific tasks may differentially affect assessed proficiency level. The present findings clearly confirm their warnings. For example, listening comprehension does not make a significant contribution to the basic reading skill models, but is a predictor of reading comprehension. If this task were to be used on its own in either a clinical or research setting it might indicate falsely that OLP does not predict basic reading skills. Two other

studies which found weak significant relationships between OLP and basic reading skills (Geva & Siegel, in press; Gholamain & Geva, in press) each used global teachers' ratings as a measure of OLP. Geva and Siegel (in press) found that Hebrew OLP explained 6 to 7% of Hebrew word recognition and word attack skills, and Gholamain and Geva (in press) found that Persian OLP predicted only 3% of Persian word recognition, and 4% of Persian word attack scores. In comparison, the present study, using a combination of OLP measures, was able to predict 16% of word recognition and 18% of word attack scores. Of further interest is how the order of entry of OLP measures into the regression model alters the significance of their contribution. For all three dependent variables grammatical judgement made a significant contribution after all other variables have been accounted for. Vocabulary was significant when entered last for both word attack and word recognition. Sentence repetition made a significant contribution following grammatical judgement, and following vocabulary, but was non-significant when both grammatical judgement and vocabulary had been accounted for. These results indicate that while sentence repetition is theoretically an expressive syntactic task, it has a strong vocabulary component.

It should be noted that the measures used in the present study may not represent a complete set for assessing OLP either. Rice (1989) discusses the four major dimensions of OLP, including, phonology, semantics, morphology, and syntax. To get a clear indication of how various aspects of OLP contribute to L1 and L2 reading it is necessary to consider also the contribution of phonological processing skills. This was an intentional omission in this paper, since the focus here was on vocabulary, syntactic, and comprehension skills. However, as mentioned previously, the present study is part

of a large scale longitudinal project. The significant contribution of other aspects of OLP, such as various phonological processing skills and phonological memory, has been documented (Geva, 1998).

FUTURE RESEARCH

Future research needs to examine the relevance of the present findings with other L2 groups and at later development stages. In particular, in congruence with Chall's (1996) model and the findings of Dale et al (1995), it is important to examine whether OLP plays a greater role in L1 reading at later development stages. How does the relationship between OLP and reading skill change for the L2 children? It may also be of value to replicate the present findings with a second cohort of children.

CONCLUSION

In conclusion, the results of the present study show that while L1 and L2 children differ in English OLP, they do not differ on scores of reading comprehension and basic reading skill measures. Further investigation reveals that this finding confirms previous research identifying a relationship between OLP and reading comprehension, but does not support findings suggesting that OLP is not a contributing variable in basic reading skills. Rather, correlation and regression analyses show that while both groups are achieving similar reading scores, OLP is playing a significant role in the development of basic reading skills for the L2 but not the L1 children. The general pattern of findings in the study fits the theoretical framework of reading development proposed by Chall (1996).

REFERENCES

Adams, M.J. (1990). Beginning to read: Thinking and learning about print. London: MIT Press.

Berko-Gleason, J. & Bernstein-Ratner, N. (1993). Language development in children. In Berko-Gleason, J. & Bernstein-Ratner, N. (Eds.), Psycholinguistics (pp. 301-350). Orlando, FL: Harcourt Brace Jovanovich College Publishers.

Chall, J.S. (1989). From language to reading and reading to language. In B. Ackerman Stewart (Ed.), Partnerships in Education: Toward a Literate America (pp. 28-33). Rockville, Maryland: American Speech-Language Hearing Association. (Asha Reports No. 17).

Chall, J. S. (1996). Stages of Reading Development (2nd ed.). Orlando, FL: Harcourt Brace College Publishers.

Cole, E. (1996). Immigrant and refugee children and families: Supporting a new road travelled. In M. Luther (Ed.), Dynamic Assessment for Instruction: From Theory to Application (pp. 35-42). Toronto: Captus University Publication.

Cummins, J. (1984). Bilingualism and special education: Issues in assessment and pedagogy. England: Multilingual Matters Inc.

Dale, P.S., Crain-Thoreson, C., & Robinson, N. M. (1995). Linguistic precocity and the development of reading: The role of extralinguistic factors. Applied Psycholinguistics, 16, 173-187.

Dickinson, D.K. & Snow, C.E. (1987). Interrelationships among prereading and oral language skills in kindergartners from two social classes. Early Childhood Research Quarterly, 2, 1-25.

Dunn, L.M, & Dunn, L.M. (1981). Peabody Picture Vocabulary Test-Revised. Circle Pines, Minnesota: American Guidance Service.

Durgunoglu, A.Y., Nagy, W.E., & Hancin-Bhatt, B.J. (1993). Cross-language transfer of phonological awareness. Journal of Educational Psychology, 85, 453-465.

Durrell, D.D. (1970). Durrell Analysis of Reading Difficulty. New York: Harcourt, Brace & Janovich.

Foorman, B.R. (1995). Research on "the great debate": Code-oriented versus whole language approaches to reading instruction. School Psychology Review, 24, 376-392.

Gardner, M. F. (1990). Expressive One-Word Picture Vocabulary Test- Revised (EOWPT-R). Novato, CA: Academic Therapy.

Geva, E. (1998). Issues in the development of second language reading: Implications for instruction and assessment. In T. Nunes & P. Bryant (Eds.) Investigating Literacy Research and Practise. (in press).

Geva, E., & Clifton, S. (1993). The development of first and second language reading skills in early French Immersion. Canadian Modern Language Review, 50, 646-667.

Geva, E., & Ryan, E.B. (1993). Linguistic and cognitive correlates of academic skills in first and second languages. Language Learning, 43, 5-42.

Geva, E., & Siegel, L. (in press). Orthographic and cognitive factors in the concurrent development of basic reading skills in two languages. Reading & Writing: An Interdisciplinary Journal.

Geva, E., Wade-Wolley, L., & Shany, M. (1997). The concurrent development of spelling and decoding in two different orthographies. Journal of Reading Behavior, 25, 383-406.

Gholamain, M., & Geva, E. (in press). The concurrent development of word recognition skills in English and Farsi. Language Learning.

Grosjean, F. (1992). Another view of bilingualism. In R.J. Harris (Ed.), Cognitive Processing in Bilinguals (pp. 51-62). North-Holland: Elsevier Science Publishers B.V.

Jastek, S. & Wilkinson, G.S. (1984). Wide Range Achievement Test (WRAT-R). Wilmington, Delaware: Jastak Associates Inc.

Johnson, J.S., & Newport, E.L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. Cognitive Psychology, 21, 60-69.

Merbaum, C. (1988). The relationship between listening and reading comprehension in first grade English L1 and L2 students. Unpublished master's thesis, OISE/University of Toronto, Toronto, Canada.

Ricard, R.J. & Snow, C.E. (1990). Language use in and out of context. Journal of Applied Developmental Psychology, 11, 251-266.

Rice, M.L. (1989). Children's language acquisition. American Psychologist, 44, 149-156.

Samuels, S. J. (1967b). Automatic decoding and reading comprehension. Language Arts, 323-325.

Samuels, S. J. & Kamil, M.L. (1984). Models of the reading process. In P.D. Pearson et al. (Eds.) Handbook of Reading Research. New York: Langman.

Snow, C.E. (1991). The theoretical basis for relationships between language and literacy in development. Journal of Research in Childhood Education, 6, 5-10.

Snow, C.E., Cancini, H., Gonzalez, P., & Shriberg, E. (1989). Giving formal definitions: An oral language correlate of school literacy. In D. Bloome (Ed.), Classrooms and Literacy (pp. 233-249). Norwood, NJ: Ablex.

Stanovich, K.E. (1984). The interactive-compensatory model of reading: A confluence of developmental, experimental, and educational psychology. Remedial and Special Education, 5, 11-19.

Verhoeven, L.T. (1990). Acquisition of reading in a second language. Reading Research Quarterly, 25, 90-114.

Willows, D. (1996, December). Raising literacy levels through in-service teacher education. Paper presented at the meeting of the National Reading Conference, Charleston, South Carolina.

Woodcock, R.W. (1987). Woodcock Reading Mastery Tests-Revised. Minnesota: American Guidance Service.

ENDNOTES

[1] The grammatical judgement and sentence repetition tasks each consisted of 52 items in T1, tapping 13 grammatical structures such as past tense and word order. In T2 and T3 the tasks were reduced to 40 items still tapping the same 13 grammatical structures. The tasks were shortened because the longer versions overtaxed and frustrated the children. Analyses were based on the 40 items used in the shorter version of the task from T2 and T3. The 12 extra items in T1 grammatical judgement were removed to make the items comparable to T2 sentence repetition, and T3 grammatical judgement. The 12 extra items in T1 sentence repetition were removed to make the items comparable to T2 grammatical judgement and T3 sentence repetition.

Table 1

Means and Standard Deviations for Oral Language and Reading Skill Measures for L1 (n=31) and L2 (n=63) Participants in T1, T2, and T3

	T1		T2		T3	
	Mean	SD	Mean	SD	Mean	SD
L1 Oral Language Measures						
Receptive Vocabulary (PPVT)	69.19	14.28	78.32	11.09	80.77	12.59
Expressive Vocabulary (EOWPT)	50.06	13.10	55.65	12.21	60.81	12.19
Grammatical Judgement (GJ)	23.97	6.38	28.35	5.35	29.97	5.86
Sentence Repetition (SR)	21.61	7.75	26.00	7.19	28.77	7.30
Listening Comprehension (LC)	15.32	4.07	15.48	4.64	12.52	4.79
Reading Skill Measures						
Word Attack (WA)	6.23	7.54	11.45	9.49	13.81	9.73
Word Recognition (WR)	4.52	4.04	7.52	4.69	9.65	5.62
Reading Comprehension (RC)	-	-	17.26	9.36	19.84	9.68
L2 Oral Language Measures						
Receptive Vocabulary (PPVT)	43.73	16.77	54.95	15.72	63.60	13.55
Expressive Vocabulary (EOWPT)	28.83	11.72	35.54	13.81	39.71	13.31
Grammatical Judgement (GJ)	21.49	4.46	23.75	5.43	26.38	5.64
Sentence Repetition (SR)	12.13	8.53	16.78	8.79	21.84	8.31
Listening Comprehension (LC)	10.79	5.48	13.73	4.72	10.94	4.71
Reading Skill Measures						
Word Attack (WA)	5.32	6.54	10.87	9.58	13.13	10.09
Word Recognition (WR)	3.84	3.21	8.00	4.70	9.71	4.77
Reading Comprehension (RC)	-	-	15.83	8.35	18.81	8.68

Note: Range of scores for each measure. PPVT (1-175), EOPWT (1-100), GJ (1-40), SR (1-40), LC (1-26), WA (1-45), WR (1-42), and RC (1-39). RC was administered in T2 and T3 only.

Table 2

Intercorrelations among Oral Language and Reading Skill Measures for L1 (n=31) and L2 (n=63) Participants in T1

	VC	GJ	SR	LC	WA	WR
L1 Oral Language Measures						
Vocabulary (VC)	1.000	0.362 *	0.516 **	0.536 **	0.132	0.037
Grammatical Judgement (GJ)		1.000	0.752 ***	0.284	0.320	0.329
Sentence Repetition (SR)			1.000	0.341	0.205	0.177
Listening Comprehension (LC)				1.000	-0.364 *	-0.337
Reading Skill Measures						
Word Attack (WA)					1.000	0.913 ***
Word Recognition (WR)						1.000
L2 Oral Language Measures						
Vocabulary (VC)	1.000	0.398 ***	0.700 ***	0.641 ***	0.484 ***	0.434 ***
Grammatical Judgement (GJ)		1.000	0.458 ***	0.411 ***	0.181	0.186
Sentence Repetition (SR)			1.000	0.580 ***	0.403 **	0.335 **
Listening Comprehension (LC)				1.000	0.221	0.222
Reading Skill Measures						
Word Attack (WA)					1.000	0.862 ***
Word Recognition (WR)						1.000

Note: VC is a combined score of receptive (PPVT) and expressive (EOWPT) vocabulary.
* significant at p< .05, ** significant at p< .01, *** significant at p< .001

Table 3

Intercorrelations among Oral Language and Reading Skill Measures for L1 (n=31) and L2 (n=63) Participants in T2

	VC	GJ	SR	LC	WA	WR	RC
L1 Oral Language Measures							
Vocabulary (VC)	1.000	0.712 ***	0.592 ***	0.273	0.239	0.279	0.369 *
Grammatical Judgement (GJ)		1.000	0.662 ***	0.296	0.268	0.371 *	0.447 **
Sentence Repetition (SR)			1.000	0.088	0.236	0.335	0.469 **
Listening Comprehension (LC)				1.000	-0.260	-0.127	0.021
Reading Skill Measures							
Word Attack (WA)					1.000	0.896 ***	0.706 ***
Word Recognition (WR)						1.000	0.896 ***
Reading Comprehension (RC)							1.000
L2 Oral Language Measures							
Vocabulary (VC)	1.000	0.455 ***	0.687 ***	0.417 ***	0.443 ***	0.356 **	0.496 ***
Grammatical Judgement (GJ)		1.000	0.612 ***	0.368 **	0.470 ***	0.543 ***	0.516 ***
Sentence Repetition (SR)			1.000	0.400 ***	0.424 ***	0.389 **	0.574 ***
Listening Comprehension (LC)				1.000	0.320 **	0.256 *	0.538 ***
Reading Skill Measures							
Word Attack (WA)					1.000	0.772 ***	0.668 ***
Word Recognition (WR)						1.000	0.772 ***
Reading Comprehension (RC)							1.000

Note: VC is a combined score of receptive (PPVT) and expressive (EOWPT) vocabulary.
 * significant at p< .05, ** significant at p< .01, *** significant at p< .001

Table 4

Intercorrelations among Oral Language and Reading Skill Measures for L1 (n=31) and L2 (n=63) Participants in T3

	VC	GJ	SR	LC	WA	WR	RC
L1 Oral Language Measures							
Vocabulary (VC)	1.000	0.391 **	0.521 **	0.424 *	0.183	0.118	0.339
Grammatical Judgement (GJ)		1.000	0.560 ***	0.458 **	0.368 *	0.388 *	0.516 **
Sentence Repetition (SR)			1.000	0.322	0.185	0.145	0.382 *
Listening Comprehension (LC)				1.000	-0.112	-0.078	0.435 *
Reading Skill Measures							
Word Attack (WA)					1.000	0.934 ***	0.456 **
Word Recognition (WR)						1.000	0.502 **
Reading Comprehension (RC)							1.000
L2 Oral Language Measures							
Vocabulary (VC)	1.000	0.577 ***	0.717 ***	0.320 **	0.517 ***	0.494 ***	0.448 ***
Grammatical Judgement (GJ)		1.000	0.635 ***	0.339 **	0.369 **	0.510 ***	0.459 ***
Sentence Repetition (SR)			1.000	0.415 ***	0.358 **	0.434 ***	0.370 **
Listening Comprehension (LC)				1.000	0.163	0.210	0.493 ***
Reading Skill Measures							
Word Attack (WA)					1.000	0.847 ***	0.681 ***
Word Recognition (WR)						1.000	0.743 ***
Reading Comprehension (RC)							1.000

Note: VC is a combined score of receptive (PPVT) and expressive (EOWPT) vocabulary.
  * significant at p≤ .05, ** significant at p<.01, *** significant at p< .001

Table 5

<u>Hierarchical Regression Models using Time and Native Language to Predict Word Recognition,</u>
<u>Word Attack, and Reading Comprehension Skills</u>

		Variable	R	R^2	Adjusted R^2	R^2 Change	F Change
<u>Word Attack</u>							
A.	Step 1	TC1	0.237	0.056	0.053	0.056	16.606 ***
	Step 2	TC2	0.345	0.119	0.113	0.063	20.010 ***
	Step 3	NL	0.347	0.120	0.111	0.001	0.413
	Step 4	TC1 x NL	0.347	0.121	0.108	0.000	0.014
	Step 5	TC2 x NL	0.347	0.121	0.105	0.000	0.001
B.	Step 1	NL	0.036	0.001	-0.002	0.001	0.366
	Step 2	TC1	0.239	0.057	0.051	0.056	16.570 ***
	Step 3	TC2	0.347	0.120	0.111	0.063	19.968 ***
	Step 4	TC1 x NL	0.347	0.121	0.108	0.000	0.014
	Step 5	TC2 x NL	0.347	0.121	0.105	0.000	0.001
<u>Word Recognition</u>							
A.	Step 1	TC1	0.308	0.095	0.091	0.095	29.289 ***
	Step 2	TC2	0.467	0.218	0.213	0.124	44.191 ***
	Step 3	NL	0.467	0.218	0.210	0.000	0.005
	Step 4	TC1 x NL	0.470	0.220	0.209	0.002	0.700
	Step 5	TC2 x NL	0.470	0.221	0.206	0.000	0.019
B.	Step 1	NL	0.004	0.000	-0.004	0.000	0.004
	Step 2	TC1	0.308	0.095	0.088	0.095	29.184 ***
	Step 3	TC2	0.467	0.218	0.210	0.124	44.033 ***
	Step 4	TC1 x NL	0.470	0.220	0.209	0.002	0.700
	Step 5	TC2 x NL	0.470	0.221	0.206	0.000	0.019
<u>Reading Comprehension</u>							
A.	Step 1	TC3	0.160	0.026	0.020	0.026	4.902 *
	Step 2	NL	0.173	0.030	0.019	0.004	0.807
	Step 3	TC3 X NL	0.173	0.030	0.014	0.000	0.022
B.	Step 1	NL	0.065	0.004	-0.001	0.004	0.79
	Step 2	TC3	0.173	0.030	0.019	0.026	4.897 *
	Step 3	TC3 x NL	0.173	0.030	0.014	0.000	0.022

<u>Note</u>: NL = native language. TC1 = time contrast 1 (T1 vs. T2).
TC2 = time contrast 2 (T3 vs. T1 and T2). TC3 = time contrast 3 (T2 vs. T3). TC1 x NL is the interaction between time contrast 1 and native language. TC2 x NL is the interaction between time contrast 2 and native language. TC3 x NL is the interaction between time contrast 3 and native language.
* significant at p< .05, ** significant at p< .01, *** significant at p< .001

Table 6

Hierarchical Regression Models using Time, Native Language, OLP, and the Interaction Between Native Langauge and OLP to Predict Word Attack

		Variable	R	R^2	Adjusted R^2	R^2 Change	F Change
A.	Step 1	TC1 TC2 NL	0.347	0.120	0.111	0.120	12.692 ***
	Step 2	LC	0.357	0.127	0.115	0.007	2.120
	Step 3	Vocab	0.508	0.259	0.245	0.131	48.915 ***
	Step 4	SR	0.521	0.272	0.256	0.013	5.058 *
	Step 5	GJ	0.546	0.298	0.280	0.026	10.099 **
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.584	0.341	0.314	0.043	4.440 **
B.	Step 1	TC1 TC2 NL	0.347	0.120	0.111	0.120	12.692 ***
	Step 2	LC	0.357	0.127	0.115	0.007	2.120
	Step 3	GJ	0.476	0.227	0.213	0.100	35.634 ***
	Step 4	Vocab	0.544	0.296	0.281	0.069	27.090 ***
	Step 5	SR	0.546	0.298	0.280	0.002	0.604
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.584	0.341	0.314	0.043	4.440 **
C.	Step 1	TC1 TC2 NL	0.347	0.120	0.111	0.120	12.692 ***
	Step 2	LC	0.357	0.127	0.115	0.007	2.120
	Step 3	GJ	0.476	0.227	0.213	0.100	35.634 ***
	Step 4	SR	0.503	0.253	0.237	0.026	9.732 **
	Step 5	Vocab	0.546	0.298	0.280	0.044	17.345 ***
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.584	0.341	0.314	0.043	4.440 **

Note: NL = native language. TC1 = time contrast 1 (T1 vs. T2).
TC2 = time contrast 2 (T3 vs. T1 and T2).
LC = listening comprehension; GJ = grammatical judgement; SR = sentence repetition; VC = vocabulary.
Step 6 includes the interaction terms between native language and the specific OLP measures.
* significant at .05, ** significant at .01, *** significant at .001

Table 7

Hierarchical Regressions using Time, Native Language, OLP, and the Interaction Between
Native Language and OLP to Predict Word Recognition

		Variable	R	R^2	Adjusted R^2	R^2 Change	F Change
A.	Step 1	TC1 TC2 NL	0.467	0.218	0.210	0.218	25.908 ***
	Step 2	LC	0.476	0.227	0.215	0.008	2.889
	Step 3	VC	0.552	0.304	0.292	0.078	30.818 ***
	Step 4	SR	0.569	0.324	0.309	0.020	8.128 **
	Step 5	GJ	0.615	0.378	0.362	0.054	23.589 ***
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.640	0.409	0.385	0.031	3.561 **
B.	Step 1	TC1 TC2 NL	0.467	0.218	0.210	0.218	25.908 ***
	Step 2	LC	0.476	0.227	0.215	0.008	2.889
	Step 3	GJ	0.593	0.352	0.340	0.125	53.340 ***
	Step 4	Vocab	0.614	0.377	0.363	0.025	10.953 ***
	Step 5	SR	0.615	0.378	0.362	0.001	0.499
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.640	0.409	0.385	0.031	3.561 **
C.	Step 1	TC1 TC2 NL	0.467	0.218	0.210	0.218	25.908 ***
	Step 2	LC	0.476	0.227	0.215	0.008	2.889
	Step 3	GJ	0.593	0.352	0.340	0.125	53.340 ***
	Step 4	SR	0.603	0.363	0.349	0.011	4.863 *
	Step 5	Vocab	0.615	0.378	0.362	0.015	6.473 **
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.640	0.409	0.385	0.031	3.561 **

Note: NL = native language. TC1 = time contrast 1 (T1 vs. T2).
TC2 = time contrast 2 (T3 vs. T1 and T2).
LC = listening comprehension; GJ = grammatical judgement; SR = sentence repetition;
VC = vocabulary.
Step 6 includes the interaction terms between native language and the specific OLP measures.
* significant at .05, ** significant at .01, *** significant at .001

Table 8

Hierarchical Regressions using Time, Native Language, OLP, and the Interaction Between
Native Language and OLP to Predict Reading Comprehension

		Variable	R	R^2	Adjusted R^2	R^2 Change	F Change
A.	Step 1	TC3 NL	0.173	0.030	0.019	0.030	2.852
	Step 2	LC	0.381	0.145	0.131	0.115	24.862 ***
	Step 3	VC	0.500	0.250	0.233	0.104	25.422 ***
	Step 4	SR	0.535	0.287	0.267	0.037	9.430 **
	Step 5	GJ	0.573	0.328	0.306	0.041	11.132 ***
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.586	0.343	0.306	0.015	1.019
B.	Step 1	TC3 NL	0.173	0.030	0.019	0.030	2.852
	Step 2	VC	0.458	0.210	0.197	0.180	41.953 ***
	Step 3	SR	0.509	0.259	0.242	0.049	11.984 ***
	Step 4	GJ	0.558	0.311	0.292	0.052	13.838 ***
	Step 5	LC	0.573	0.328	0.306	0.017	4.565 *
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.586	0.343	0.306	0.015	1.019
C.	Step 1	TC3 NL	0.173	0.030	0.019	0.030	2.852
	Step 2	SR	0.479	0.229	0.217	0.199	47.608 ***
	Step 3	GJ	0.543	0.295	0.280	0.066	17.148 ***
	Step 4	LC	0.563	0.317	0.299	0.022	5.865 *
	Step 5	VC	0.573	0.328	0.306	0.011	2.850
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.586	0.343	0.306	0.015	1.019
D.	Step 1	TC3 NL	0.173	0.030	0.019	0.030	2.852
	Step 2	GJ	0.508	0.258	0.246	0.228	56.634 ***
	Step 3	LC	0.539	0.290	0.275	0.032	8.241 **
	Step 4	VC	0.565	0.319	0.301	0.029	7.782 **
	Step 5	SR	0.573	0.328	0.306	0.009	2.324
	Step 6	NL x LC NL x VC NL x SR NL x GJ	0.586	0.343	0.306	0.015	1.019

Note: NL = native language. TC1 = time contrast 1 (T1 vs. T2).
TC2 = time contrast 2 (T3 vs. T1 and T2).
LC = listening comprehension; GJ = grammatical judgement; SR = sentence repetition;
VC = vocabulary.
Step 6 includes the interaction terms between native language and the specific OLP measures.
* significant at p< .05, ** significant at p< .01, *** significant at p< .001