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Expressive Vocabulary Development of Immigrant Preschoolers Who Speak Somali, Spanish, and Hmong

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Abstract

This research investigated the use of a measure of expressive vocabulary to monitor the development of preschoolers learning English. Over 1200 preschoolers whose primary language was Somali, Hmong, Spanish, or English were assessed three times during one year using an Individual Growth and Development Indicator (IGDI) for Picture Naming, a one-minute teacher-administered tool. Results of analyses indicated that this expressive language measure is sensitive to growth over one year for all groups learning English as another language. Average scores varied with the primary language spoken at home. Most notably, Somali-speaking children showed larger English expressive vocabularies than Spanish- or Hmong-speaking children. This research has implications for monitoring and intervening with English-learning skills for children most at risk for future academic challenges.

Introduction

A challenge confronts teachers who work with young English-language learners: research evidence about the language acquisition of bilingual children is sparse. The preschool years of typical monolingual language learners are marked by significant vocabulary and language growth. While children's first two years are characterized by acquiring sounds in the phonological system, learning basic vocabulary, and acquiring a foundational understanding of the relationships among words to communicate a wide variety of messages, the third through fifth years dramatically expand on understanding and producing an array of grammatical structures and vocabulary. In fact, the average preschooler's vocabulary grows from approximately 200 words at 24 months to approximately 2000 by the time he or she is 5 years old (Justice & Pence, 2008). These changes in preschoolers' communication skills are also predictors of reading outcomes among young monolingual children (Scarborough, 1998; Dickinson & McCabe, 2001; Lonigan, Burgess, & Anthony, 2000; Storch & Whitehurst, 2002).

However, there is an ongoing debate about whether a young child's first language (L1) is vulnerable to regression when another language (L2) is introduced during the preschool years. Researchers have reported a decrease in children's L1 skills when they were introduced to L2 as they entered preschool settings. Turkish children learning Dutch (Leseman & De Jong, 2001), French preschoolers learning Dutch (Schaerlaekens, Zink, & Verheyden, 1995), Spanish-

speaking children learning English (Kohnert, Bates, & Hernandez, 1999; Kohnert, 2002), and Hmong preschoolers learning English (Kan & Kohnert, 2005) all demonstrated this tendency. Conversely, other researchers who explored the impact of Spanish-speaking children learning English found that children continued to make progress in L1 after their introduction to L2 when enrolled in a high-quality preschool program (Rodríguez, et al., 1995; Winsler, et al., 1999) and when followed across time (Hammer et al., 2003). Hammer et al. (2007) compared language abilities of bilingual children who started learning English at home (simultaneous bilingual language learners) to those who did not start learning English until they began preschool in the Head Start[1] program (sequential bilingual language learners). They found that both Head Start groups increased their English and Spanish skills at the same rate, but those who were exposed to English from birth had higher scores in English than those who started learning English in preschool. On the other hand, those who were exposed to English in preschool had higher Spanish language scores than those who were simultaneous bilingual language learners. Hammer and colleagues (2003) posited that assessing the children's *rate of change* in language abilities "provides a broader picture of development" (p. 244) than when test scores at one point in time are considered. They concluded that "these results necessitate that children's language abilities be evaluated early and monitored regularly…[and that] educational programs need to collect baseline data on children's abilities in both languages upon school entry and continue to collect data periodically…to determine growth" (p. 244).

Aside from the methodological differences among the studies that account for conflicting findings (Winsler, et al., 1999), researchers agree that there are many factors that impact the L1 and L2 learning environments, including variation in educational, social, cultural, and economic factors, language patterns and sociolinguistic goals of the home, and developing cognitive, emotional and social characteristics of the children (Kan & Kohnert, 2005; Winsler, et al., 2007). This study aims to help bridge the gap in our knowledge of bilingual language acquisition by assessing the expressive language skills of preschool children who spoke primarily Hmong, Somali, or Spanish in the home (L1) before attending a Head Start program where they began to learn English (L2). Specifically, this research follows the expressive vocabulary development in English of these sequential bilingual language learners (ELL) and compares their scores over three points in an academic year using a measure of expressive language development that was developed to evaluate and monitor the growth of children whose primary language was English (PLE). A secondary objective of this investigation is to assess the effectiveness of this tool for measuring the growth of English (L2) vocabulary of these sequential bilingual language learners. I will begin by providing a brief overview of each of three distinct groups in this study, Spanish, Hmong, and Somali, and then will review the evidence for the utility of the assessment tool to monitor expressive vocabulary development.

Spanish

In the United States, there are 37.5 million Mexican-origin immigrants, or 12.5 percent of the total population and 30.7 percent of all immigrants, one of the largest immigrant groups (Batalova, n.d.). There have essentially been three waves of Mexicans living in the United States, beginning in the 1800s when territory that is now part of California, Arizona, and New Mexico was ceded to the United States, again in the early 1900s, and the third wave occurring at the present time. Many immigrants arrive in the United States to escape poverty, in search of employment, education, and better opportunities for themselves and their families. The educational backgrounds of immigrant students vary considerably, from some adolescents who attended Secundaria in Mexico (approximately 7th-9th grade in the U.S.), some who attended

only a few years of Primaria (grades 1-6), and still others who were never enrolled in school in Mexico and have limited literacy skills (Romo, 1993).

In 2006, 60.2 percent of Mexican immigrants to the U.S.A. reported no high school diploma or equivalency. In addition, 75 percent self-reported limited English proficiency (U.S. Census Bureau, 2006). Yet, the need to learn English is a common variable for most; over 90 percent of Latinos/Latinas in all parts of the country think it is important to learn English, and to maintain Spanish (Blanton, 2004).

The similarities between the Spanish and English phonological systems are well documented (Lopez & Greenfield, 2004; Lindsey, Manis, & Bailey, 2003), as is the cross-linguistic transfer of early reading skills such as print awareness, letter knowledge, and rapid naming (Lindsey, Manis, & Bailey, 2003). However, a recent study by Mathes and colleagues (2007) suggests that the level of proficiency of the first language while learning a second language may be more important than the similarities between the two languages.

Hmong

A mountain people from the countries of Laos, Thailand, and North Vietnam, the Hmong began immigrating to the United States in 1975 when U.S. troops were evacuated from North Vietnam and the Hmong people feared persecution from the new communist government (Cerhan, 1990). At the time of the 2000 U.S. Census, there were 169,428 Hmong in the United States, and they were one of the fastest growing immigrant populations (Thao, n.d.). Historically, the Hmong culture is considered preliterate and primarily of an oral tradition (McInnis, 1991) with no widely-accepted written form until the 1960s (Duffy, 2007). Although few people have received formal literacy instruction in Hmong (Smalley, 1990), Hmong parents value literacy and academic pursuits, and want their children to learn skills in written and spoken English (Vang & Barrara, 2005). Hmong is a monosyllabic language with eight basic tones. With immigration to the United States and acculturation, many English words have been incorporated into their vocabulary (e.g., *computer*, and medical terms).

Somali

Somalia's dictator, Barre, fled the country in 1991, leading to a complete collapse of the Somali state and a fierce civil war among clans (Scuglik, et al., 2007). With the war and subsequent famine, Somalis began immigrating to other countries in Africa, as well as to Europe and North America (Bhui et al., 2006). In 2006, approximately 10,370 Somali refugees (25.2% of all refugees) came to the United States (U.S. Bureau of the Census, 2006). Somalis are part of a nomadic culture that emphasizes collaborative learning and working, and prefers large social gatherings over reading (Masny & Ghahremani-Ghajar, 1999). Somali is the official language in Somalia, although Arabic, English, and Italian are commonly used. The Somali language was put into written form in 1972 using English Latin letters, when there was a campaign in Somalia to increase the literacy rate among the rural population. By 1974, the majority of Somalis were literate in Somalian script. However, the civil war and breakup of the central government has resulted in a decline in literacy (Wikipedia.org, retrieved June 16, 2008). Masny (1999) describes Somalis as having multiple literacies—home-based, religious, and school-based. Home-based literacy is primarily an oral tradition that communicates histories through memorized stories, poems, and songs (Scuglik, et al., 2007). Religious literacy is based on the Qu'ran, with children learning classical Arabic at approximately five years of age, often through rote memorization in written and spoken forms. If school is available, Somali children start attending when they are seven years old. School literacy is thus in the language of the school that is attended. In Somalia, Italian is the language of the universities. The sounds in the Somali

language include 22 consonants, 20 pure vowel sounds, and three tones (high, low, and falling). The language borrows vocabulary from Arabic, Persian, English, and Italian (Wikipedia.org, retrieved June 16, 2008).

Measuring and Monitoring Children's Expressive Language Growth

Typical assessments of language skills for children between 3- and 5-years of age have several limitations. First, as with most developmental assessments of young children, they are conducted during single sessions (Neisworth & Bagnato, 1996) and results provide limited or no information about a child's development *over time*. Most notably, the results of these assessments do not include ongoing (e.g., monthly or quarterly) information about a child's development. This lack of repeatability greatly limits professionals' ability to monitor growth and/or improve the effects of treatment (Deno, 1997). Second, assessment of developing language skills does not necessarily lead to intervention of these skills, as it should in early childhood (Bricker, Pretti-Frontczak, & McComas, 2002; Good, Simmons, & Smith, 1998). In other words, a decision-making model is rarely implemented for young preschool children that links on-going assessment of developing English skills with a plan, whether it is to monitor a child's development, provide intervention, or modify intervention strategies (Early Childhood Research Institute for Measuring Growth and Development (ECRI-MGD), Technical Report 5, 1998).

General Outcome Measurement (GOM) addresses the issue of assessing change in a student's performance in a targeted instructional area, such as language and literacy by administering a task repeatedly over time (Deno, 1986, 1997; Deno, Mirkin, & Chiang, 1982). By definition, GOMs:

> (1) Are *easy* to administer and interpret
> (2) Provide direct assessment and are *sensitive* to growth or progress for different ages or across time
> (3) Provide *useful* information about the need to initiate or modify a child's intervention plan
> (4) Are supported by empirical evidence of *reliability* and *validity* (Fuchs & Deno, 1991)

Following the logic of General Outcome *Measurement, Individual Growth and Development Indicators* (IGDIs) were developed at the University of Minnesota to assess and describe developmental progress of children from birth to five years of age (Early Childhood Research Institute, Technical Report 6, 1998). More specifically, an IGDI preschool measure for expressive language (i.e., *Picture Naming*) has been developed and is increasingly used in many applied and research settings (McConnell, McEvoy, & Priest, 2002; Missall, McConnell, & Cadigan, 2006).

The *Picture Naming* IGDI meets the GOM criteria for ease, usefulness, sensitivity, reliability, and validity. IGDIs correlate highly with standardized language and literacy instruments that must be administered by a professional with training or expertise, are much briefer to administer (1-2 minutes per measure), can be administered repeatedly within short time frames, and measures growth over short periods of time (McConnell, Phaneuf, & Murphy, 2002; McConnell, Priest, Davis, & McEvoy, 2002; Missall, 2002; Priest, McConnell, McEvoy, & Shin, 2000). Reliability of *Picture Naming* was reported by McConnell and colleagues (2002) in a study with 29 preschoolers. They reported one-month alternate form reliability coefficients (r) ranging from .44 to .78 and test-retest reliability across three weeks at $r = .67$, $p < .01$.

Evidence of convergent validity of *Picture Naming* is found in research with other standardized measures of language development and with presumed correlates of language (e.g., literacy). For example, in a longitudinal investigation with approximately 90 preschool children from 36 to 60 months of age (including children with disabilities and those living in poverty), Priest and colleagues found that the *Picture Naming* IGDI was positively correlated with the *Peabody Picture Vocabulary Test – Third Edition* (PPVT-3; Dunn & Dunn, 1997; r = .56 to 75, p < .001) and with the *Preschool Language Scale – 3* (PLS-3; Zimmerman, Steiner, & Pond, 1992; r = .63 to .79, p < .001) (Priest, Davis, McConnell, McEvoy, & Shin, 1999; Priest, McConnell, McEvoy, & Shin, 2000). Predictive validity has also been reported in several studies with significant correlations between children's *Picture Naming* scores and chronological age (r = .41 in a longitudinal study with 90 preschoolers, and r = .60 in a cross-sectional study with 39 preschoolers). These studies have included typically developing children, children enrolled in Head Start, and children with disabilities (McConnell, Priest, Davis, & McEvoy, 2002).

Small-scale studies have assessed the *Picture Naming* IGDI's sensitivity in measuring expressive vocabulary skills in English of children whose home language was Spanish (Missal & McConnell, 2004) and Hmong (Nitsiou, 2001). As expected, both found that their *Picture Naming* scores were significantly lower than for children whose primary language was English, but the IGDIs were sensitive enough to measure rate of growth over time. These studies, or any other studies to date, did not compare the rate of growth of children whose primary language was English (PLE) to that of ELL children.

Given the growing incidence of ELL children in U.S. schools, the mounting evidence for the role of preschool language development to preventing later reading and academic problems or failure, and the development of the *Picture Naming* IGDI to monitor early language development, it is important to further examine developmental trajectories of English for ELL children. In particular, this study will use the *Picture Naming* IGDI to examine its ability to measure growth of expressive vocabulary skills in English of preschoolers who speak Somali, Hmong, Spanish, or English. Further, it examines whether the home language explains the trajectory in development of expressive vocabulary skills. Specifically, the following questions are addressed:

1. What are the expressive vocabulary scores and developmental trajectories of English-, Somali-, Spanish-, and Hmong-speaking preschoolers on the *Picture Naming* IGDI?
2. Are there significant differences among the four language subgroups (English, Somali, Spanish, and Hmong) in scores and developmental trajectories on the *Picture Naming* IGDI?
3. Is the *Picture Naming* IGDI sensitive enough to reveal growth over time in English expressive vocabulary for ELL children?

Methods

Participants

A total of 1,154 Head Start preschool children (545 boys, 609 girls; Table 1) enrolled in 95 classrooms participated. In order to take part in the study, children had to meet Head Start's criteria for enrollment (U.S. Federal Poverty Guidelines), and did not have an identified disability. The children were not directly recruited. Rather, extant data were used without identifying information. A large Head Start program in a Midwest metropolitan area and the *Center for Early Education and Development* (CEED) of the University of Minnesota collaborated on a larger project to train teachers to administer preschool early literacy IGDIs. The IGDIs were one of this Head Start program's outcome-based measures, and teachers administered them

several times during the academic year. The study reported here is drawn from the database of a larger study that included other preschool early literacy IGDIs. Only those children who participated in the *Picture Naming* IGDI three times during the school year are included in the analyses.

Table 1 provides demographic information for participating children. Ethnicity/racial information was not available, although there was information about home language, which was the primary focus. Parents or caregivers indicated that 48.2% of the children spoke English as their primary language (PLE), 35.1% spoke Spanish, 10.1% spoke Somali, 6.7% spoke Hmong. Children whose specific home language accounted for less than 2% of the total population were not included in the analysis. Approximately 5% of the total population of these Head Start preschoolers spoke a home language other than English, Spanish, Somali, or Hmong; the home language of another 1.5% of children was not provided, so these children were also excluded from analysis. Overall, 51.8% of the children included in the analysis had a home language other than English (ELL). At the start of this study, the mean age of all children was 50.82 months (SD = 6.34; age range = 33 – 67 months).

Table 1. Demographic Information for Participating Children

	Total	Boys	Girls	Minimum Age	Maximum Age	Mean Age	Std. Deviation
***PLE Children (%)**	**556 (48.2)**	**258 (22.4)**	**298 (25.8)**	**34.00**	**61.75**	**50.33**	**6.39**
****ELL Children (%)**	**598 (51.8)**	**287 (24.9)**	**311 (27.0)**	**33.00**	**67.00**	**51.27**	**6.25**
Spanish speakers	405 (35.1)	185 (16.0)	220 (19.1)	33.00	67.00	50.96	6.26
Somali speakers	116 (10.1)	60 (5.2)	56 (4.9)	36.79	62.30	51.67	6.43
Hmong speakers	77 (6.7)	42 (3.6)	35 (3.0)	39.00	61.75	52.30	5.85
Total Participants	**1154 (100)**	**545 (47.2)**	**609 (52.8)**	**33.00**	**67.00**	**50.82**	**6.34**

*PLE= Children whose primary language is English
**ELL=Children Learning English as a 2nd Language

Stimuli and Procedures

Children's expressive language skills were measured with the *Picture Naming* IGDI (Missal & McConnell, 2004), an individually-administered test developed for use with preschoolers between approximately 30 and 70 months of age. For this task, children are shown cards with a single color picture (photographs and line drawings) of everyday objects found in natural environments (e.g., home, classroom, community) of a typical five-year-old child. Children are asked to name the objects as quickly as possible (from a set of approximately 120 pictured objects) in one minute. The teacher demonstrates the task for each child by naming four cards quickly, and then asks the child to name the same cards quickly. During administration, if the child is unable to name the sample cards, the task is discontinued. If the child does not respond within 3 seconds, the examiner prompts the child by asking, "What's this?" or "Do you know what this is?" and provides an additional 2 seconds for the child to respond before advancing to the next card. A child's score is the number of pictures named correctly in one minute. [2]

Children's expressive vocabulary skills were assessed at Head Start in the fall, winter, and spring over the course of one academic year. Lead researchers and graduate students from the University of Minnesota trained Head Start teachers to administer the preschool *Picture Naming* IGDI. During a designated two-week period in the fall (late September, early October), teachers individually administered the IGDI to each child in their classroom. Every attempt was made to administer IGDIs to all children enrolled during that period, although some children were absent during the entire period. This procedure was repeated in the winter (late December, early January) and spring (late March, early April) of the school year. Teachers administered each measure and immediately recorded the child's score on a recording form, which included the child's identification number, gender, date of birth, primary language spoken at home, and disability status. These extant data were used for analysis of expressive vocabulary abilities of young children who speak Somali, Hmong, Spanish, and English.

The use of extant data made it impossible to control for fidelity of administration of the IGDIs or to evaluate reliability of administration. The psychometric properties of the *Picture Naming* IGDIs provide evidence for their reliability with trained and closely supervised examiners. *Picture Naming* scores appear to be relatively stable over time, as indicated by a study that analyzed one-month alternative form reliability coefficients and found a range from r = .44 to .78 (Missall & McConnell, 2004). Test-retest reliability with a small sample of Head Start teachers was also good (r = .67, p < .01) (Missall & McConnell, 2004). In the present study, I estimated test-retest reliability by calculating correlation coefficients between individual children's *Picture Naming* scores in the fall and winter (r = .72), and in the winter and spring (r = .69).

Data Analysis

To provide descriptive information about the independence among the ten Head Start centers, ANOVAs were conducted using the *Picture Naming* score as the dependent variable. ANOVA indicated that Head Start centers were significantly different from one another (F = 13.98, p < .001), supporting the need for a statistical procedure that takes into account nested data.

Hierarchical Linear Modeling (HLM)[3] is a multilevel modeling procedure ideal for this study because it accounts for nested data and repeated measures found in studies of children over time (Raudenbush & Bryk, 2002). Analysis of repeated measures must take into account the lack of independence between repeated observations of each child (e.g., fall, winter, and spring *Picture Naming* scores). HLM is essentially a combination of two regression equations. One equation (level 1) examines the effects at the individual level (e.g., a child's *Picture Naming* score in fall, winter, and spring). The other equation (level 2) examines the effects between children (e.g., the extent to which home language, English, Spanish, Somali, or Hmong, affects a child's *Picture Naming* score).

The primary analysis examined the extent to which the *Picture Naming* IGDI (outcome variable) measured expressive vocabulary skills of Somali-, Hmong-, Spanish-, and English-speaking preschoolers, specifically differences in mean scores and rates of growth among these children. Secondly, I wanted to know if the *Picture Naming* IGDI scores, administered three times (fall, winter, spring) over the course of an academic year, changed over time (i.e., Was *Picture Naming* sensitive to rate of growth?) and if rate of growth was related to home language. The HLM repeated measure analyses simultaneously predict the overall score and rate of growth in children's expressive vocabulary skills by using the predicted value of IGDI scores for a child at the median age of 54.77 months as the intercept and the difference between each administration point as the slope (rate of growth). Based on past IGDI research, I predicted that

all children would exhibit growth over time (i.e., that the *Picture Naming* IGDIs would be sensitive to children's growth in expressive vocabulary skills). Further, based on previous, albeit limited, research about sequential bilingual language learners, I hypothesized that children whose primary language was English (PLE) would have higher scores than, but similar slopes (rates of growth) as, children learning English as another language (ELL), and that the ELL children would be similar to each other.

Results

Mean scores on the *Picture Naming* IGDI for each home language group (English, Spanish, Hmong, and Somali) at each assessment point are shown in Table 2. For the overall group, mean *Picture Naming* scores increased over time, from 12.20 in the fall to 15.73 in the winter, and to 18.28 in the spring.

Because it is possible that gender, along with chronological age and home language, is related to performance on an expressive vocabulary assessment, a preliminary HLM analysis was conducted. This analysis indicated that gender did not account for any significant proportion of variance (p = .54) to children's *Picture Naming* scores. These results supported our decision to exclude gender as a possible explanatory variable for differences in scores.

Null Model: Age

The next HLM analysis was conducted to describe children's rate of growth for the *Picture Naming* IGDI simply based on age (Null Model). Results indicated that children's *Picture Naming* scores increased significantly with age. The children's average score at the median age of 54.77 months was 15.91 (t = 61.18, p < .001), with a significant increase in *Picture Naming*

The average rate of increase in scores was .66 pictures per month (t = 23.87, p < .001) (Table 3). Examination of the variance components for *Picture Naming* revealed a significant variation around the intercept (c^2 [1152] = 3803.44, p < .001) and slope (c^2 [1152] = 1374.51, p < .001) yet to be explained. This suggests significant variation among all children in scores and slope for *Picture Naming*. Thus, adding *Home Language* as a variable to a model with an *Age* parameter is warranted to understand the impact of home language on these scores and developmental trajectories.

Table 2. Group Differences in *Picture Naming* in Fall, Winter, and Spring

Assessment Period	*PLE	**ELL	Spanish	Hmong	Somali	All Children
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
(Mean Age in Months)	Range	Range	Range	Range	Range	Range
Fall	16.99 (8.36)	7.74 (8.58)	7.0 (8.70)	10.84 (8.22)	8.27 (7.97)	**12.20 (9.65)**
(50.8)	0-54	0-54	0-52	0-35	0-39	**0-54**
Winter	20.42 (8.89)	11.37 (9.60)	10.52 (9.32)	16.66 (8.49)	10.84 (10.21)	**15.73 (10.31)**
(54.5)	0-58	0-42	0-42	0-32	0-41	**0-58**
Spring	22.84 (8.56)	14.04 (9.74)	13.34 (9.85)	18.66 (8.31)	13.41 (9.45)	**18.28 (10.18)**
(57.0)	0-50	0-45	0-43	2-40	0-45	**0-50**

*PLE= Children whose primary language is English
**ELL=Children Learning English as a 2nd Language

Conditional Model: Age *and* Home Language

In this follow-up analysis, I wanted to determine whether children's home language explained the change in expressive vocabulary scores over and above age. When using HLM to examine growth, a null model has limited predictor variables (e.g., age), while a conditional model adds explanatory variables (e.g., home language or gender). Specific home languages–Somali, Hmong, and Spanish—were added as variables to the model that included *Age*, with *Picture Naming* IGDI scores still the outcome variable. The intercept (b_{00}) represented the mean IGDI score for PLE children at the median age of 54.77 months, and b_1 through b_3 represented children whose primary language was Somali, Spanish, or Hmong, respectively.

Table 3. Fixed Effect Estimates of Variance Components for *Picture Naming* IGDI Scores and *Age*

Fixed Effect	Coefficient	Standard Error	t -ratio
Picture Naming Intercept (b_{00}; Level 1)	15.91	0.26	61.18***
Slope (Level 2)	0.66	0.03	23.87***
Estimates of Variance	Estimated Parameter Variance	c^2	Degrees of Freedom
Picture Naming Intercept	64.63	3803.44***	1152
Slope	0.04	1374.51***	1152

*p<.10; **p<.01;***p<.001

Note: Effects for expressive vocabulary (Picture Naming) are level 1 effects; effects for *Picture Naming* over time are level 2 effects and indicate the degree to which level 1 effects varied across time. The proportion of explained variance represents the total percentage of between-child variance explained by Age in the model.

When the data were controlled for age, PLE children scored an average of 15.89 (t = 73.95, p < .001) pictures per minute, significantly higher than children who speak *Somali* (t = -8.08, p < .001), *Spanish*, (t = -20.94, p < .001), and *Hmong*, (t = -13.45, p < .001). Rate of growth for PLE children was .65 pictures per month (t = 25.39, p < .001), and rate of growth for Somali-speaking children was .90 pictures per month, significantly greater than the PLE children (t = 2.79, p < .006). Rate of growth for Spanish and Hmong speakers was not significantly different from PLE children (Table 4). As Figure 1 illustrates, ELL children were older than PLE children when they began naming pictures in English. Furthermore, visual inspection of the results suggests that rate of expressive vocabulary growth was greatest for Somali children and similar for English, Spanish, and Hmong children. Thus, analysis of *Picture Naming* scores supported the hypothesis that PLE children would have higher scores than ELL children. The hypothesis that PLE and ELL children would have similar rates of growth, however, was only partially supported, in that the home language interacted with children's performance on *Picture Naming* scores.

Table 4. Fixed Effect Estimates of Variance Components for *Picture Naming* IGDI Scores and *Home Language*

Part A

Fixed Effect	Coefficient	Standard Error	t -ratio
Picture Naming Intercept ($b_{00;}$ Level 1; English)	15.89	0.22	73.95***
Somali (b_1)	-6.13	0.76	-8.08***
Spanish (b_2)	-10.26	0.49	-20.94***
Hmong (b_3)	-10.11	0.75	-13.45***
Slope (Level 2; English)	0.65	0.03	25.39***
Somali	0.26	0.09	2.79**
Spanish	0.02	0.06	0.34
Hmong	0.04	0.08	0.54

Part B

Estimates of Variance	Estimated Parameter Variance	c^2	Degrees of Freedom	PV[a]
Picture Naming Intercept	39.30	2735.81***	1149	0.39
Slope	0.07	1390.05***	1149	-0.70

[a] Proportion of variance explained by Level-2 predictors = Null Model variance – Conditional Model variance/Conditional Model variance

*p<.10; **p<.01;***p<.001

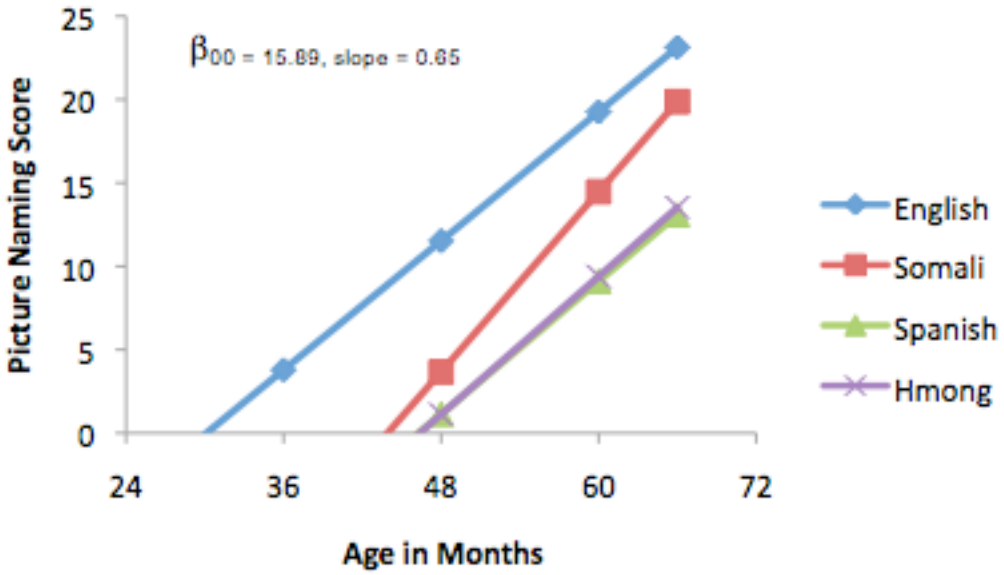

Figure 1: Rate of growth for Picture Naming IGDI based on *Home Language*

The variance components of random effects showed significant individual differences yet to be explained in both intercept and slope (Table 4). Comparing variance estimates between the Null Model and the Conditional Model, the proportion of variance (PV) in the intercept and slope explained by *Home Language* was 0.39 and -0.70, respectively. The proportion of variance for the intercept indicated that a child's home language explained 39% of the variability in children's *Picture Naming* scores. However, the proportion of variance for the slope indicated that *Home Language* did not significantly explain any more than the *Age* parameter alone in rate of growth of expressive vocabulary skills.

Discussion

This study followed English-, Somali-, Hmong-, and Spanish-speaking preschoolers from low-income families for nine months, and examined their performance on an expressive vocabulary measure (*Picture Naming* IGDI), relations between the different languages on children's performance of this measure, and the sensitivity of this IGDI to measure growth of English expressive vocabulary skills for ELL children. All language groups showed significant progress in mean scores and rates of growth across the nine months. When children's performance was examined over and above their ages, differences in mean scores for *Picture Naming* were explained primarily by their home language. Rates of growth in expressive vocabulary skills, however, were explained by their age. Lastly, results indicated that the *Picture Naming* IGDI was a sensitive measure of English vocabulary growth for children who speak Somali, Hmong, and Spanish, meaning that it captured change in expressive vocabulary scores over a relatively short period of time. The following sections will discuss the implications of these results.

Cross-Cultural Comparisons

This study contributes to our knowledge of English expressive vocabulary development in L2 in general, and specifically for Somali-, Hmong-, and Spanish-speaking children. The results of this investigation and the rule of parsimony would dictate that home language is a primary variable to consider and include in a model that explains variability in English expressive vocabulary skill development among children in poverty. Differences in average scores between PLE and ELL children are not surprising given available research (Adams, 1990; Durgunoglu, Mir, & Arino-Marti, 2002; Snow, C., 1999; Tabors, 1998; Tabors & Snow, 2002) and clinical experience. However, this study extends past research by describing rates of growth of the PLE and ELL groups, as well as differences in average scores and rates of growth among specific language groups (i.e., English-, Somali-, Hmong-, and Spanish-speaking preschoolers). Based on ecological theory, there are several plausible explanations for why home language may result in differences in English expressive vocabulary trajectories, including child characteristics (e.g., cognitive, emotional, and social development), family characteristics, and cultural variations (educational expectations, literacy, social and economic status).

Although many researchers report that language and literacy development are influenced by family characteristics (Snow et al., 1991; Bennett, Weigel, & Martin, 2002; Roberts, Jurgens, & Burchinal, 2005), research on the association between family characteristics and different linguistic or cultural groups is just beginning to emerge. Research to date suggests that family characteristics such as predominant language spoken in the home, whether literacy activities in the home and preschool occur in the child's L1 or English, the length of time children have been exposed to their L1 and English, how well parents speak English, and parental educational expectations influence early language and literacy development (Goldenberg, et al., 2001). A study by Hammer, Miccio, and Wagstaff (2003) compared home literacy experiences of

Spanish-speaking children who either learned English simultaneously with Spanish, or sequentially when they entered preschool. Results revealed no differences in the home literacy experiences of the two groups related to the value placed on literacy, although mothers whose children were simultaneously learning English and Spanish engaged in more activities that supported academic achievement than mothers of sequential learners (Hammer, Miccio, & Wagstaff, 2003). These studies, along with the results of this research, strongly suggest that future efforts should include further examination of the relationship between family characteristics, the home environment, and cultural/linguistic groups.

Cultural differences in the home environment may also affect children's rate of vocabulary growth in L1 or L2. Hart and Risley's (1995) hallmark research on language development of L1 English-speaking children in low-income families revealed that the quantity of spoken language in the home environment had the greatest impact on language development and future academic success. The value that a culture places on verbal interactions with its young children or literacy-related activities may affect a child's early vocabulary development. For example, the Somali culture values learning stories and the Qu'ran through early memorization. Might this be related to a more verbal environment than other cultures, and thus result in faster vocabulary development in L2, as this study demonstrated? Future research that compares the home environment of different cultures and their L1 and L2 vocabulary development may offer insight into the L2 development of these young children.

An additional plausible explanation for differences in L2 vocabulary development of the Somali-, Hmong-, and Spanish-speaking children in this study may be related to the linguistic characteristics of their languages. The characteristics of Hmong (monosyllabic language with eight basic tones) and Somali (22 consonants, 20 pure vowel sounds, and three tones) may differentially affect how young children hear English phonemes and learn English vocabulary. The effect of cross-linguistic transfer (language skills learned in one language affect acquisition of skills in another language) has been documented in studies on literacy development (phonological awareness, letter knowledge) in a variety of bilingual populations, including Spanish (Durgunoglu, Nagy, & Hansin-Bhatt, 1993), French (Sprenger-Charolles, Siegel, & Bonnet, 1998), Portuguese (Cardoso-Martins, 1995), Turkish (Durgunoglu & Oeney, 2000; Oeney & Durgunoglu, 1997), Italian (Cossu, et al., 1988), and German (Wimmer, et al., 1991). Additionally, numerous studies have found correlations across Spanish, Chinese, and Hmong languages in phonological awareness (Durgunoglu, 1998; Gottardo, 2002; Gottardo, et al., 2001; Lindsey, Manis, & Bailey, 2003). Future research that explores the effect of cross-linguistic transfer between English and the L2 on vocabulary and literacy development is warranted.

Future research on the power of family, cultural, and linguistic characteristics in L2 learning will provide additional insight into how best to address the learning needs of young L2 learners. This information could offer guidance about differentiated intervention strategies based on language characteristics.

Classroom Factors

An additional variable to account for differences in English expressive vocabulary development may be related to teachers' primary language and their match to children's language, and how and when the two languages are used during the preschool day (Limbos & Geva, 2001; Tabors & Snow, 2002). In the program where these data were collected, if more than half of the children in a classroom spoke the same L1 other than English, the L1 of a member of the classroom team (often an assistant teacher) was matched to the children's L1. Nonetheless, some ELL children

were not matched with an educator who spoke the same primary language. In either scenario, teacher language differences might explain group language differences.

Another classroom factor may be the role of L1. Kan and Kohnert (2005) observed that, in a bilingual preschool classroom, English was the language of instruction, while Hmong was used to manage behavior and transition children between activities. Future research should be conducted to assess whether systematic teacher-child language matching or role of L1 and L2 in the classroom affects the rate of growth in children's vocabulary skills. This research could advise future programs about intervention variables that promote optimal language, literacy, and academic success when L1 and L2 are at play.

Implications for Interventions

It is well established that early vocabulary development is related to academic and literacy success for L1 learners (Scarborough, 2001; Dickinson & McCabe, 2001; Lonigan, Burgess, & Anthony, 2000; Storch & Whitehurst, 2002). We know less about the interaction between L1 and L2 vocabulary development for bi- or multilingual language learners and its influence on later academic and reading success. Thus, although the results of this study are descriptive, they should guide future research to explore not only differences between mono- and multilingual language and literacy learning, but also differences among multilingual learners. Understanding the cultural and linguistic differences could lead to appropriate intervention programs that are sensitive to the various needs of different language groups, such as adapting parenting education opportunities and classroom environments in center-based early childhood education settings.

The goals of this research were to examine whether there were differences in vocabulary development of young children based on their diverse home languages, and to assess the sensitivity of the *Picture Naming* IGDI in measuring growth for young children whose primary language was not English. This study, plus past research that has demonstrated the IGDIs' sensitivity to growth of children in typical early childhood classrooms and English-speaking children in Head Start, lends compelling support for the use of the *Picture Naming* IGDI as a way to monitor the oral language development of ELL children. The developers of the IGDIs have conducted research that compares children's home language scores on *Picture Naming* IGDIs developed for Spanish and Hmong speakers to their scores on the English *Picture Naming* IGDI (Missall & McConnell, 2004; Nitsiou, 2001). Information about the value of *Picture Naming* IGDIs might be further enhanced if children were assessed in English as well as their home language. Ideally, continued development of *Picture Naming* IGDIs in other languages will allow practitioners to use them in conjunction with the English *Picture Naming* IGDIs to monitor growth in L1 and L2 among bilingual learners. If children did not show progress in the size of their vocabulary after successive assessments, a comprehensive evaluation may be warranted to determine the reasons for limited progress. The use of the IGDIs would allow practitioners to identify struggling children and begin interventions in a timely manner.

Limitations

For several reasons, it is important to interpret these data cautiously. First, the results should be considered carefully when generalizing to other samples. Although the sample size was large, it included only children from impoverished environments. Furthermore, I lacked information about the proficiency in either English or the home language of the ELL children. Different levels of proficiency in either language may result in different trajectories for each language group (Tabors & Snow, 2002). A third limitation lies in the nature of doing research with an extant data set in that one cannot always obtain reliability or fidelity information on the

teachers who administered the measurement tool. Although the results of the data analysis should be interpreted with care, the large data set and the reliability/fidelity demonstrated in previous IGDI research contributes to the validity of this study.

In closing, this study found that home language is a powerful correlate of expressive vocabulary development among Head Start preschool children. Significant differences in mean scores of ELL language groups indicate that all Head Start preschoolers are acquiring English, some at a greater rate than others. While these data suggest that not all ELL children are closing the gap with PLE children, further research about the differences in performance between ELL and PLE children in other socioeconomic groups, or about other children in poverty who do not participate in Head Start is surely warranted. Because the *Picture Naming* IGDI was shown to be a sensitive and useful measure to monitor the English expressive vocabulary skills of ELL children, it is a useful tool to monitor ELL children's vocabulary development so that intervention can occur sooner rather than later. Closing that gap between ELL and PLE performance on the IGDIs is clearly an outcome that early childhood educators should pursue. Educational administrators and educators who are concerned with closing the gap between children in poverty, which includes many children learning English, recognize the challenges of serving the poorest children. The *Picture Naming* IGDI represents a tool to begin addressing this challenge. Future research to identify other prominent variables that impact early language development and to modify existing assessment tools can only promote the advancement of language, literacy, and academic success for all children.

Notes

[1] The Head Start Program is a program of the United States Department of Health and Human Services that provides comprehensive education, health, nutrition, and parent involvement services to low-income children and their families.

[2] More information, technical reports, samples, procedures, and stimulus materials are available at http://ggg.umn.edu.

[3] In HLM, centering of the intercept is based on theoretical and/or practical concerns. For descriptive purposes, when theoretical and practical considerations do not dictate otherwise, there is some analytic benefit to locating the intercept near the center of available data.

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