Nouns and verbs: Across- and within-language associations in young dual language learners

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Abstract

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Studies of young dual language learners (DLLs) suggest that there may be within-language and across-language associations as children acquire two languages. Understanding typical DLL development can support effective teaching environments and strategies for improved bilingual outcomes. This study examined within- and across-language associations through retrospective analysis of noun vocabularies, verb vocabularies, noun learning (i.e., fast mapping), and verb learning (i.e., syntactic bootstrapping) in 367 DLLs aged 3-5 years acquiring Spanish and English. Expected within-and across-language associations were revealed, though inconclusive across-langauge associations suggest complex across-language associations at play in bilingual development. Differences in vocabulary or word learning between participants of different language exposure, socioeconomic status, and age groups suggest that external factors may further influence dual language development. Results overall support some across-language influence in dual language development likely affected by external factors which can be modified to support bilingual outcomes.

Introduction

Much of what we know about language development in early childhood comes from research with children learning only a single language; however, there are as many bilingual children worldwide as there are monolingual children (Paradis, Genesee, & Crago, 2011). In the United States, approximately 21% of school-age children speak a language other than English at home with the number projected to continue increasing (U.S. Department of Education, 2014). The term dual language learner (DLL) can be used to define a young child aged birth to five years who is still developing their home language while acquiring a second language, thus learning two languages (Guzman-Orth, Lopez, & Tolentino, 2017). The present paper focuses on DLLs who are reported to use and receive input in both Spanish and English to varying degrees at home.

Given the ever-growing number of DLL and multilingual children, recent decades have seen a rapid increase in research focusing on children acquiring two or more languages. Still, most of the evidence focuses on language products (e.g., measures of expressive or receptive vocabulary in one or more languages), with more limited attention to the processes that children use to acquire new language. The purpose of this thesis is to examine how DLLs learn verbs and nouns, and compare word learning processes with existing vocabulary across and within languages. We examine this question in a sample of preschool children aged 3-5 years who are learning both English and Spanish. In the remainder of the introduction, this thesis will examine: 1) the body of literature on vocabulary development in DLLs, with specific attention to both nouns and verbs in the early lexicon; 2) existing evidence for how DLLs acquire new nouns and verbs; and 3) the limited body of evidence on how vocabulary and word learning processes relate to each other within and across a DLL's two languages. In addition, we consider how age, sex,

socioeconomic status (SES), and language exposure in English and Spanish may relate to vocabulary and word learning processes in both languages.

Vocabulary Development in Dual Language Learners

Evidence for distributed vocabulary. For DLLs exposed to two languages, there is a relationship between the quantity and quality of input in a single language and the child's expressive vocabulary, which is consistent with the research in monolingual children (Hoff et al., 2012; Patterson, 2000; Place & Hoff, 2011; Thordardottir, Rothenberg, Rivard, & Naves, 2006). However, DLLs often experiences differences in input across languages. For example, many DLLs tend to hear one language more frequently than the other and demonstrate stronger skills in the language in which they experience higher quantity of exposure (Hoff, Core, Place, Rumiche, Senor, & Parra, 2012). Some input may be higher quality, or more facilitative for language development than other input, such as receiving input from several different speakers of a language. This is thought to contribute to greater phonological, lexical, and syntactic diversity and variability of the language in a way that is supportive of language development (Place & Hoff, 2011; Fisher, Church, & Chambers, 2004; Richtsmeier, Gerken, Goffman, & Hogan, 2009).

Differences in quantity and quality of input across languages may result in what is referred to as a "distributed vocabulary." That is, a DLL may learn specific vocabulary in each language rather than learn vocabulary that overlaps across languages (Oller, 2005; Oller & Jarmulowicz, 2007; Patterson & Pearson, 2004). For instance, a young child exposed to Spanish only at home may learn everyday home-related vocabulary words in Spanish, but not in English. The same child exposed to English only at school may then learn academic terms in English, but not in Spanish. This distributed nature of linguistic organization is apparent across linguistic

domains (i.e, vocabulary and grammar), consistent across bilingual children, and is more pronounced at younger ages (Oller, Pearson, & Cobo-Lewis, 2007).

Factors influencing input. Quantity and quality of input in both languages can vary widely between individuals. For example, in a study conducted by Dubasik and Wilcox (2013), DLLs demonstrated linear development in their primary language, or L1 (Spanish) over time whereas vocabulary development in their secondary language, or L2 (English) showed high variability between children. Input can even change over time, with some DLLs becoming increasingly exposed to their L2 as older siblings attend English language school or as parents use English more frequently as children move from infancy to school age (Bridges & Hoff, 2013; Hoff, Rumiche, Ribot, & Welsh, 2014). Such shifts may result in young DLLs becoming increasingly dominant in their L2 as they get older, to the point where some children who begin language development acquiring two languages may grow to be monolinguals in adulthood (Gathercole & Thomas, 2009; Kohnert, 2002; Najafi, 2011; De Houwer, 2007).

Socioeconomic status (SES) may also affect the input a child receives in a language in either quantity or quality. Hart and Risley (1995) revealed significant differences in the amount of caregiver speech heard by young monolingual children across SES groups, with children living in poverty hearing approximately 30 million less words on average compared to higher SES peers. Several studies confirm similar associations between SES and quantity of caregiver speech (Fernald, Marchman, & Weisleder 2013; Rowe, 2012; Weisleder & Fernald, 2013). Qualitative features of input may additionally be impacted by SES, or may mediate effects of low SES on language development (Hoff, 2003; Rowe, 2008; Rowe, 2012). It is important to note that variations exist within SES groups and literature on quality of input as a function of SES is currently limited (Schwab & Lew Williams, 2016). Overall, such aspects of caregiver

speech that may be associated with SES may affect a child's speech processing efficiency (i.e., the speed and accuracy with which children comprehend the speech stream), and such differences in SES groups exist in DLLs (Wood, Diehm, & Callender, 2016; Marchman, Martinez, Hurtado, Gruter, & Fernald, 2016; Gathercole, Kennedy, & Thomas, 2015).

A child's sex may also impact language development, with some evidence supporting sex differences in domains such as language comprehension and grammatical skills for children up to 36 months (Zambrana, Ystrom, & Pons, 2012; Zhang, Jin, Shen, Zhang, & Hoff, 2008). However, evidence for sex differences in the preschool years are limited and suggest that sex differences may not persist after the child's third birthday (Le Normand, Parisse, & Cohen, 2008; Farrant, Mattes, Keelan, Hickey, & Whitehouse, 2013; Simonsen, Kristoffersen, Bleses, Wehberg, & Jørgensen, 2014).

Measuring vocabulary. Due to the distributed nature of DLLs' word knowledge, measuring vocabulary using only one language may result in a lexicon that appears reduced when compared to monolingual children. With enough exposure to each language, bilingual speakers can achieve similar proficiency in one language (or two) compared to monolingual speakers (Hoff & Core, 2015). However, due to differences in exposure (e.g., a Spanish-English bilingual with limited exposure to formal Spanish throughout the lifespan), some bilingual-monolingual differences may persist lifelong because vocabulary development is continuous and has no quantifiable limit to the number of words one can learn (Hoff et al., 2012; Patterson & Pearson, 2004; Pearson & Fernandez, 1994; Gathercole & Thomas, 2009; Bialystok & Feng, 2011; Bialystok, 2009). Young DLLs acquiring two languages require special considerations for measuring vocabulary. One well-established method for representing a DLL child's overall vocabulary is the combined lexicons of both languages, which demonstrate that bilingual and

monolingual children have similar total vocabulary sizes (Bedore, Peña, García, & Cortez, 2005; De Houwer, Bornstein, & Putnick, 2014; Hoff et al., 2012; Pearson, Fernández, & Oller, 1993).

Evidence for across-linguistic influence. Although there is evidence supporting distributed vocabulary knowledge in DLLs, other studies suggest that vocabularies across both languages may overlap, with a proportion of their lexicon being translation equivalents. Translation equivalents are words across two languages that share semantic similarity, though they may not share other linguistic similarities such as phonological and orthographic form (e.g., *pencil* in English and *lápiz* in Spanish). The proportion of translation equivalents in a DLL's lexicon can vary widely between children (Legacy, Zesiger, Friend, & Poulin-Dubois, 2016). Overlapping vocabularies may be influenced by factors such as exposure to both languages, with higher proportions of translation equivalents occurring in DLLs with more balanced exposure, including those who have been exposed to their L2 for at least two years (David & Wei, 2008; Pearson, Fernandez, & Oller, 1995; Poulin-Dubois, Bialystok, Blaye, Polonia, & Yott, 2012). Young DLLs, even in early stages of language development, may have overlapping vocabularies and demonstrate up to 30% translation equivalents in their lexicons following sufficient exposure to both languages (Oller at al., 2007; Pearson et al., 1995).

Some evidence also suggests that there is mutual influence between a child's vocabulary development in their two languages, though research is limited. For example, word learning in either L1 or L2 may be facilitated by prior knowledge of the translation equivalent in the non-target language (Bilson, Yoshida, Tran, Woods, & Hills, 2015). DLLs may use vocabulary knowledge in L1 to support growth in L2 by mapping new L2 vocabulary onto familiar L1 concepts (De Groot & Keijzer, 2000; Costa, Santesteban, & Cano, 2005). They may also apply linguistic skills in one language to support language and literacy in another language, suggested

by a strong relationship between L1 phonological awareness and L2 decoding in DLLs (Melby-Lervag & Lervag, 2011). However, DLLs demonstrate limited to no across-domain language skill transfer (e.g., Spanish vocabulary does not influence English grammar) (Simon-Cereijido & Mendez, 2018).

Finally, the composition of a DLL's vocabulary may shift over time as input across both languages changes. For example, Goodrich and Lonigan (2018) investigated vocabulary knowledge in Spanish-English bilingual children over two academic years. Children initially had higher unique Spanish vocabulary scores compared to unique English or shared Spanish-English vocabulary. By the end of the first year, shared Spanish-English vocabulary scores were higher than unique English and unique Spanish vocabulary scores. This change in the size of shared vocabulary over time suggests across-linguistic influence in vocabulary development, or at least points to a common factor that may be contributing to growth in both languages. This supports aforementioned evidence suggesting sufficient exposure in both languages influences the proportion of translation equivalents in a DLL's lexicon (Pearson et al., 1995).

Present study. Given mixed evidence supporting both distributed vocabularies and across-linguistic interactions, the current research aims to clarify how vocabularies (including nouns and verbs) are related across languages. Further, research on a bilingual child's vocabulary thus far has focused on general vocabulary across and between both languages; however, different word classes may not be acquired equally. For example, children may use different cognitive processes to acquire nouns and verbs. Limited research exists which examine word classes within a DLL child's lexicon, such as nouns and verbs. This gap in understanding DLLs' vocabulary developments is one the current research wants to address.

Word Learning in Dual Language Learners

Given that DLLs receive input in two languages, it is crucial to understand how DLLs build their lexicons in each language and acquire new nouns (via fast mapping) and new verbs (via syntactic bootstrapping). For DLLs, there are two possible theories for how they acquire new vocabulary: 1) children may take advantage of general word learning strategies and apply them to acquire new words in both languages, or 2) word learning could also be a language-specific process and the skills may not transfer. This section discusses two established word learning processes called fast-mapping and syntactic bootstrapping, as well as across-language interactions in word learning.

Fast mapping in DLLs. Fast mapping is argued to be the first step in the comprehensive word learning process, during which children use available linguistic and nonlinguistic information to rapidly infer a word's meaning after as little as a single exposure (Carey & Bartlett, 1978). This study focuses on fast mapping as it relates to acquiring novel nouns, though fast mapping can be used to describe the overall rapid acquisition of word meaning. The existing data on fast mapping in young DLLs are limited and inconclusive, and largely focused on comparing word learning between bilingual and monolingual children (Hammer, Hoff, Uchikoshi, Gillanders, Castro, & Sandilos, 2014).

Some evidence suggests that the cognitive processes involved in fast mapping are similar between DLLs and monolingual children. In a study conducted by Alt, Meyers, and Figuerroa. (2013), bilingual and monolingual preschoolers performed similarly when learning nonwords phonetically similar to their L1, but bilingual preschoolers were less accurate when learning English-like nonwords. Differences in fast mapping performance between bilingual and monolingual children in these instances were concluded to be due to language differences

between L1 and L2 rather than differences in cognitive processes for fast mapping, given similar performances when learning nonwords phonetically similar to their L1. In another study, bilingual preschoolers and monolingual preschoolers performed similarly when learning a novel word for a novel object, but bilingual children were more accurate when learning a novel word for a known object (Kaushankaya, Gross, & Buac, 2014). This suggested that DLLs may have been more flexible at acquiring novel labels for a known object due to prior experience with multiple word-object associations, whereas the cognitive process of acquiring a novel word-object association is similar across monolingual and bilingual children.

In contrast, other evidence suggests that the cognitive processes for fast mapping in bilingual children may be different from fast mapping in monolingual children. Eviatar, Taha, Cohen, and Schwartz (2018) compared fast mapping in Hebrew-Arabic bilingual kindergartners against fast mapping in monolingual Hebrew and Arabic speakers. In their study, bilingual children performed with greater accuracy than monolingual children, suggesting that multilingualism may sharpen fast mapping skills and give bilingual children an advantage with fast mapping. However, it should be noted that the study was conducted with children aged 5-6 years, for whom the word learning process may be cognitively different compared to preschool children aged 3-5 years.

Syntactic bootstrapping in DLLs. Syntactic bootstrapping is the process by which children use the grammatical structure of a sentence to acquire information about verb meaning (Naigles, 1996; Gleitman, 1990). Existing data on syntactic bootstrapping focus largely on monolingual children with various language backgrounds (Naigles & Hoff-Ginsberg, 1998; Arunachalam, Syrett, & Chen, 2016; Bedore & Leonard, 2000). The process of syntactic bootstrapping to learn a novel verb is generally considered more difficult for children than noun

learning, and this has been demonstrated across multiple languages (Imai, Li, Haryu, Okada, Hirsh-Pasek, Golinkoff, & Shigematsu, 2008). This challenge is not uniquely an issue of retention or accurate word usage, but it begins with initially acquiring a novel verb's meaning. Preschoolers acquiring meanings of words via storybook reading, for instance, were more effective at fast mapping nouns versus verbs (McLeod & McDade, 2011). Preschoolers may also more readily assume that a novel word is associated with an object over an action, such as when presented with an unknown agent performing an unfamiliar action (Abbot-Smith, Imai, Durrant, & Nurmsoo, 2017).

Given potential differences in vocabulary knowledge and distribution between monolingual and bilingual children, bilingual children may acquire verbs differently from monolingual children. However, there is limited research investigating syntactic bootstrapping in bilingual children, preventing conclusive information on the cognitive process of syntactic bootstrapping in DLLs. To the best of our knowledge, one study conducted by Childers et al. 2017 investigated whether bilingual children engage different cognitive processes during verb learning. In the study, English, Mandarin, and Korean-speaking children fast mapped verbs performed by variable agents. When bilingual children were excluded or included, results did not significantly differ, suggesting that the cognitive process for syntactic bootstrapping in bilingual children is similar to fast mapping verbs in monolingual children. There are no existing studies, however, that directly compare how bilingual children learn verbs in both of their languages. Understanding verb-learning processes in DLLs may provide greater insight into the language learning processes of both languages as well as potential across-language influence in verb learning.

Across-language interactions in word learning. As aforementioned, evidence examining fast mapping for L1 and L2 of bilingual children is conflicting. On one hand, fast mapping performance with novel words may be similar between L1 and L2 of bilingual children, suggesting similar cognitive processes in both languages that may not favor one language over another (Kan & Kohnert, 2008). On the other hand, bilingual preschoolers may more quickly fast map novel words that are phonetically similar to their L1 versus L2, suggesting DLLs may use cognitive processes that favor one language over another when acquiring novel words (Alt et al., 2013; Van Horn & Kan, 2016). There is limited evidence comparing how DLLs learn new words in both of their languages. Given sparse and conflicting studies about word learning in bilingual preschoolers, there is not yet conclusive evidence about word learning processes in DLLs, particularly when comparing fast mapping or syntactic bootstrapping within and across both languages. It is possible, however, that given the phonological, semantic, and structural/syntactic similarities between English and Spanish (e.g., Subject-Verb-Object word order) children may be able to apply noun and verb learning strategies in one language to support noun and verb learning in the other language.

Present Study

Although recent years have witnessed an increased understanding of bilingual language development, there remains significant gaps in the field's knowledge of the relation between the word learning process and specific vocabulary knowledge in a DLL child. Given the known differences in acquiring nouns via fast mapping versus acquiring verbs via syntactic bootstrapping, it may be beneficial to examine such word learning processes in bilingual children, particularly as they relate across and within languages and to already acquired

vocabulary. A deeper understanding of the word learning process in a DLL child is crucial in supporting language development for this growing population. Preschool aged DLLs are of particular interest, considering emerging evidence preschoolers may learn new vocabulary differently from older ages, including young bilingual children (Alt et al., 2013; Oller et al., 2007; Fisher, 2002). Research questions of this thesis are as follows:

1. What are the across- and within-language associations between noun and verb vocabularies in preschool children learning two languages?
2. What are the across- and within-language associations between noun and verb learning processes in preschool children learning two languages?
3. How does vocabulary knowledge relate to children's ability to acquire new nouns and verbs in DLLs, within and across languages?
4. Does noun and verb vocabulary knowledge or word learning vary as a function of age (3, 4, 5), socioeconomic status, sex, or language exposure in a subset of children who have more detailed reports of home language experience?

Methods

Participants

364 Spanish-English DLLs aged 3-5 years participated in this study (M= 55.8 months, SD= 7.7 months). All participants were enrolled in preschools or Head Start Programs in Massachusetts, Pennsylvania, Delaware, Florida, and California. Approximately 80% of the children qualified as low SES, determined by maternal education when reported or Head Start income eligibility when maternal education was not reported. Children with an Individualized Education Program (IEP) were excluded from this study.

Language exposure information was gathered for about 30% of the sample via parent report on a questionnaire (125 participants). See Appendix A for the language exposure questionnaire administered. Language exposure on a 5-point scale ranged from primarily English (1) to primarily Spanish (5), (M= 3.3, SD= 1.15). This subset of participants were subsequently categorized into three groups based on parent report information: English Dominant; Spanish Dominant; and Balanced Bilingual preschoolers. These categories are relevant only for research question 4. See Table 1 for cut-off scores and distribution of participants across categories.

Table 1

Language Exposure for Subset of Participants

	English Dominant	**Spanish Dominant**	**Balanced Bilingual**
Cut-off Score	1-2.5	3.5-5	2.5-3.5
Percent (n)	20%, n= 25	47%, n= 59	33%, n=41

Data Collection

These data were collected as part of a larger study to develop and norm a new computerized assessment called the Quick Interactive Language Screener: English and Spanish (QUILS:ES). The QUILS:ES was designed to screen language comprehension of English-Spanish DLLs aged 3 through 5 years, and can be administered by non-language specialists in approximately 20-30 minutes using touchscreen technology (Iglesias, de Villiers, Golinkoff, Hirsh-Pasek, & Wilson, in preparation). QUILS:ES contains twelve subtests across three areas of language development: vocabulary, syntax, and language-learning process. The QUILS:ES was administered to all participants in this study by members of the QUILS:ES team. The English

and Spanish versions of the QUILS:ES presented task instructions with similar syntactic structure due to the structural similarities between English and Spanish.

The QUILS:ES has high internal consistency reliability (English: Cronbach's alpha = .895, n = 361; Spanish: Cronbach's alpha = .858, n = 361) and strong test-retest reliability (English: r (25) = .782, p <.000; Spanish: r (25) = .640, p <.000) across a period of 4 to 6 weeks. Convergent validity was evaluated with bilingual administration of the Preschool Language Scales-5 (PLS-5; Zimmerman, Steiner, & Pond, 2011, 2012) (Iglesias et al., in preparation).

Data on children's existing *Noun Vocabularies* and *Verb Vocabularies* were collected through a receptive language task. To assess *Noun Vocabulary*, four familiar pictures were presented simultaneously and children pointed to the target noun following audio instructions (e.g., "Find the dustpan."/ "Encuentra el recojedor."). To assess *Verb Vocabulary*, three familiar pictures were presented simultaneously and children pointed to the target verb following audio instructions (e.g., "Who is waving?"/ "¿Quien esta saludando?").

The QUILS:ES presented five novel non-word nouns in learning trials and extension trials to assess noun learning, or *Fast Mapping*. During the learning trial, children were shown four pictures simultaneously: two novel objects, and two known objects. Children then heard task instructions with linguistic cues about which novel object was associated with the novel word presented (e.g., "A *merf* is a kind of bird. Show me the *merf*."/ "La *teña* es un tipo de flor. Enséñame la *teña*."). Three of the pictures were foils, with the two known objects being linguistically-aligned foils (i.e., agreed with cues used to signal the correct object) and one being a novel object foil (i.e., a novel object that did not agree with linguistic cues). See Figure 1 for an example.

During the extension trial, children were instructed to again identify the novel word-object association. Four objects were presented, three of which were not shown during the learning trial. One object acted as a linguistically-aligned and novel object foil. The other two objects acted as either only a linguistically-aligned or novel object foil. The target object was presented differently from the learning trial (e.g., a different color or different orientation). Task instructions during the extension trial removed cues about the target item (e.g., "Can you show me another merf?"/ "¿Me puedes enseñar otra teña?"). See Figure 2 for an example.

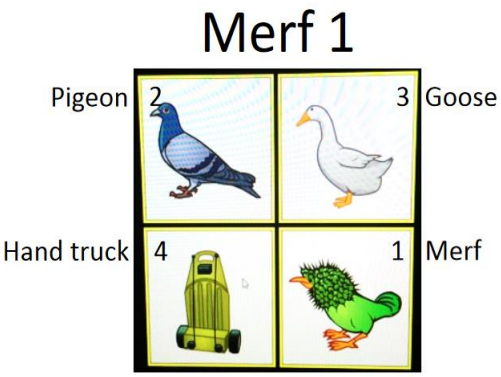

Figure 1. Fast mapping merf learning trial. The pigeon and goose act as linguistically aligned foils. The hand truck acts as a novel object foil.

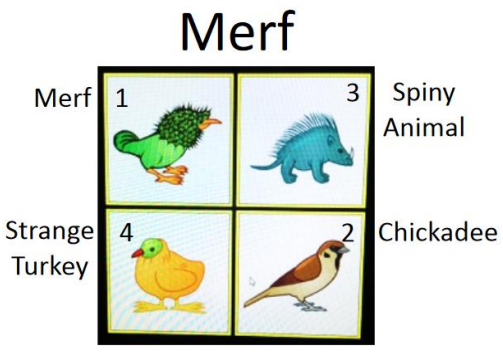

Figure 2. Fast mapping merf extension trial. The merf has changed orientation from the learning trial. The strange turkey acts as a linguistically-aligned and novel object foil. The spiny animal acts as a novel object foil, and the chickadee acts as a linguistically-aligned foil.

To assess verb learning, or *Syntactic Bootstrapping*, the QUILS:ES first presented a picture with multiple agents, one of whom was acting on another agent or object. An audio was presented with the picture to highlight the target action (e.g., "Mira, un señor está *ruciando* a una niña. Oye, un señor está *ruciando* a una niña."/ "Look, someone is *coobing* someone. Hey, someone is *coobing* someone."). Following this presentation, three new pictures of actions were presented simultaneously, one of which demonstrated the target action with a different presentation (e.g., different agents completing the action), and two of which acted as foils. One picture acted as a perceptual foil (e.g., the same people acting out a different action), while the other picture acted as an unrelated object foil (e.g., a single individual not previously presented). Children were instructed to point to the target action (e.g., "¿Puedes encontrar otro igual? Encuentra 'el señor está *ruciando* a una niña.'" / "Can you find another one? Find 'someone is *coobing* someone.'"). See Figure 3 for an example.

Figure 3. Syntactic bootstrapping coobing trial. The first picture is the initial presentation of the novel action word. The row of three pictures is used to assess syntactic bootstrapping by instructing children to identify the novel action. The first picture acts as an unrelated object foil.

The third picture acts as a perceptual foil. The target action appears different from the initial presentation with new agents and orientation.

Data Analysis and Hypotheses

This study will focus on children's *Noun Vocabulary*, *Verb Vocabulary*, *Fast Mapping*, and *Syntactic Bootstrapping* in English and Spanish. To investigate the first research question (across- and within-language associations between *Noun* and *Verb Vocabularies*), means of *Noun Vocabulary* and *Verb Vocabulary* in English and Spanish will be calculated. Correlational tests will look for associations between *Noun Vocabulary* and *Verb Vocabulary* across- and within-languages. (e.g., Spanish *Nouns*- Spanish *Verbs*, English *Nouns*- Spanish *Nouns*, English *Nouns*- Spanish *Verbs*). We hypothesize stronger within-language associations relative to across-language associations.

A similar correlational test will also examine associations between *Fast Mapping* and *Syntactic Bootstrapping* across- and within-languages. We hypothesize significant across- and within-language word learning associations, suggesting that DLLs rely on similar strategies for word learning in both languages.

To examine how vocabulary knowledge relates to *Fast Mapping* and *Syntactic Bootstrapping*, correlational tests will be conducted to examine associations between vocabulary and word learning. Further, simple regression will be calculated with *Noun* and *Verb Vocabulary* as the predictor variables and *Fast Mapping* and *Syntactic Bootstrapping* as the outcome variables. We hypothesize that vocabulary knowledge will predict word learning more strongly within-languages than across-languages.

Post-hoc ANOVA analyses will examine developmental trends across sex, age group, language exposure, and SES. We expect significant differences between age groups, language exposure groups, and SES groups. To examine age groups, children will be categorized into three different groups: 1) children aged 3 years, 0 months to 3 years, 11 months, 2) aged 4 years, 0 months to 4 years, 11 months, 3) aged 5 years, 0 months to 5 years, 11 months. ANOVA analyses will be conducted to compare means of *Noun Vocabulary, Verb Vocabulary, Fast Mapping,* and *Syntactic Bootstrapping* between age groups. Similarly, ANOVA analyses will be conducted to examine *Noun Vocabulary, Verb Vocabulary, Fast Mapping,* and *Syntactic Bootstrapping* across language exposure groups: 1) Spanish Dominant, 2) English Dominant, 3) Balanced Bilingual.

Results

Across and Within Language Associations

Noun vocabulary and verb vocabulary correlations. A partial correlation test controlling for age at first test administration was conducted on *Noun Vocabulary* and *Verb Vocabulary* means in Spanish and English for all participants. As expected, there were significant within-language associations between English *Noun* and *Verb Vocabularies*, [$r(359)=.288$, $p = .000$], and between Spanish *Noun* and *Verb Vocabularies* [$r(359)=.470$, $p=.000$]. There were no significant across-language associations. See Table 2 for across-language associations between *Noun* and *Verb Vocabularies*.

Fast mapping nouns and syntactic bootstrapping verbs correlations. A partial correlation test controlling for age at first test administration was conducted on *Fast Mapping* and *Syntactic Bootstrapping* means in Spanish and English for all participants. As expected,

there were significant associations both within and across languages. The strongest correlation was between *Syntactic Bootstrapping* across languages [$r(359)=.355$, $p=.000$] and the weakest correlation between *Fast Mapping* across languages [$r=(359)=.233$, $p=.000$]. See Table 2 for across-language associations between *Fast Mapping* and *Syntactic Bootstrapping*.

Vocabulary and word learning correlations. A partial correlation controlling for age at first test administration was conducted on Spanish and English means in *Noun Vocabulary, Verb Vocabulary, Fast Mapping,* and *Syntactic Bootstrapping* in all participants. There were significant across-language correlations between English *Verb Vocabulary* and Spanish *Fast Mapping*, English *Verb Vocabulary* and Spanish *Syntactic Bootstrapping*, and English *Noun Vocabulary* and Spanish *Syntactic Bootstrapping*. See Table 2 for across-language vocabulary and word learning correlations. There were also significant within-language correlations between vocabulary and word learning in both English and Spanish. See Table 3 for within-language vocabulary and word learning correlations.

Predictors of word learning. Regression analyses were conducted for all participants with *Fast Mapping* and *Syntactic Bootstrapping* means in Spanish and English as dependent variables. Independent variables for both *Fast Mapping* and *Syntactic Bootstrapping* were age at first test administration. Spanish and English *Noun Vocabulary* were independent variables for *Fast Mapping.* Spanish and English *Verb Vocabulary* were independent variables for *Syntactic Bootstrapping*. Significance of word learning predictors varied. See Table 4 for coefficients of word learning predictors.

Table 2

Across-Language Correlations of Vocabulary and Word Learning

	Spanish Vocabulary		**Spanish Word Learning**	
	Noun	Verb	Fast Mapping	Syntactic

				Bootstrapping
English Vocabulary				
Noun	-.035	-.030	.064	**.122***
Verb	.029	.070	**.164***	**.186***
English Word Learning				
Fast Mapping	-.019	.001	**.233***	**.248***
Syntactic Bootstrapping	.035	.097	**.296***	**.355***

* $p<.05$

Table 3

Within-Language Correlations of Vocabulary and Word Learning

	English		**Spanish**	
	Noun Vocabulary	Verb Vocabulary	Noun Vocabulary	Verb Vocabulary
Fast Mapping	**.355***	**.341***	**.298***	**.348***
Syntactic Bootstrapping	**.261***	**.281***	**.149***	**.150***

* $p<.05$

Table 4

Standardized Coefficients of Age and Vocabulary as Predictors of Word Learning Within- and Across- Languages

	Dependent Variables			
	English		Spanish	
	Fast Mapping	Syntactic Bootstrapping	Fast Mapping	Syntactic Bootstrapping
Independent Variables				
English Vocabulary				
Noun	**.369***	---	.077	---
Verb	---	**.271***	---	**.142***
Spanish Vocabulary				
Noun	-.007	---	**.297***	---
Verb	---	.078	---	**.181***
Age	**.119***	**.227***	**.162***	.063

* $p<.05$

Post-Hoc Analyses

Sex. ANOVA analyses were conducted to examine English and Spanish vocabulary knowledge and word learning between male (n=179) and female (n=183) participants. No significant differences were found between sexes for English and Spanish vocabulary knowledge and word learning.

Age groups. Participants were grouped into three age groups: 1) 3;0-3;11 (n=70), 2) 4;0-4;11 (n=160), 3) 5;0-5;11 (n=133). ANOVA analyses were conducted to examine English and Spanish vocabulary knowledge and word learning between age groups. Significant differences between age groups were revealed in all areas of vocabulary knowledge and word learning across both languages ($p<.05$).

Language exposure. A subset of participants (n=125) reported language exposure information via a parent-completed survey. See Appendix A for administered survey in both English and Spanish. Participants were rated on a 5-point scale ranging from primarily English (1) to primarily Spanish (5). Participants were grouped into Spanish Dominant, English Dominant, or Balanced Bilingual. Refer to Table 1 for cut-off scores and breakdown of participants. ANOVA analysis revealed that there was no significant difference in age between language exposure groups.

ANOVA analyses were conducted to examine English and Spanish vocabulary and word learning between language exposure groups. There were significant differences between language exposure groups in English *Noun Vocabulary* [$F(2, 120)=6.583$, $p=.002$], Spanish *Noun Vocabulary* [$F(2, 120)=10.858$, $p=.000$], and Spanish *Verb Vocabulary* [$F(2, 120)=8.545$, $p=.000$]. There were no significant differences in word learning or in English *Verb Vocabulary* between groups.

Tukey analyses were conducted to further examine differences between language exposure groups. Analyses revealed significant differences in English *Noun Vocabulary* between English Dominant and Spanish Dominant groups [Mean Difference= .22181 favoring English Dominant, p=.001]. Significant differences in Spanish *Noun Vocabulary* were between Spanish Dominant and English Dominant groups [Mean Difference=.28095 favoring Spanish Dominant, p=.000] and between Balanced Bilingual and English Dominant groups [Mean Difference=.26007 favoring Balanced Bilingual, p=.000]. Significant differences in Spanish *Verb Vocabulary* were between Spanish Dominant and English Dominant groups [Mean Difference=.30527 favoring Spanish Dominant, p=.000] and between and Balanced Bilingual and English Dominant groups [Mean Difference=.20440 favoring Balanced Bilingual, p=.028].

Socioeconomic status. Participants were grouped into mid-SES or low-SES, depending on either maternal education when reported or Head Start income eligibility. Given that approximately 80% of the sample qualified as low-SES, mid-SES participants were matched with low-SES participants for analysis. Matching was based on age at first test administration and sex. Participants were matched if they were the same sex and within two months of age on first test administration. There was a total of 71 matches (n=142). After matching mid- and low-SES participants, an ANOVA analysis revealed that there were no significant differences in age between SES groups.

ANOVA analyses were conducted to examine English and Spanish vocabulary and word learning between mid- and low-SES participants. Results demonstrated significant differences between groups in word learning: English *Fast Mapping* [F(1, 144)=6.460, p=.012], English *Syntactic Bootstrapping* [F(1, 144)=8.095, p=.005], Spanish *Fast Mapping* [F(1, 144)=10.197,

p=.002], and Spanish *Syntactic Bootstrapping* [*F*(1, 144)=11.091, *p*=.001]. There were no significant differences in English and Spanish vocabulary between groups.

Discussion

Summary and Implications of Across- and Within-Language Associations

This study investigated how preschool aged DLLs exposed to Spanish and English learn verbs and nouns by comparing word learning processes with existing vocabulary. First, we analyzed associations in *Noun* and *Verb Vocabulary* across-and within-languages. As predicted, participants' vocabulary knowledge scores were associated within-language (i.e., Spanish *Noun Vocabulary* and Spanish *Verb Vocabulary* were positively correlated); however, vocabulary knowledge across languages was not associated (i.e., Spanish *Noun Vocabulary* and English *Noun Vocabulary* were not associated). This finding is consistent with literature that suggests DLLs have distributed vocabularies due to receiving input in separate contexts (e.g., a DLL hears English at school and Spanish at home and acquires vocabulary related to such contexts versus translation equivalents). Therefore, it is not surprising that a DLL's verb and noun knowledge in one language is not related to verb and noun knowledge in another language. Since we did not test for potential translation equivalents, we are unable to determine the extent of overlapping vocabulary knowledge. Nonetheless, this finding suggests that participants may have substantial variability in their English and Spanish vocabularies by the time they reach preschool.

In contrast to the vocabulary findings, analyses of *Fast Mapping* and *Syntactic Bootstrapping* revealed significant within- and across-language correlations. Recall that the strongest correlation was between *Syntactic Bootstrapping* across-languages, and the weakest was between *Fast Mapping* across-languages. Verb learning between Spanish and English may be more strongly correlated than noun learning due to similarities between Spanish and English

syntactic structures (e.g., simple active sentences in both languages follow a subject-verb-object order) and the important role syntax plays in verb learning (Hartsuiker, Pickering, & Veltkamp, 2004; Fisher, 2002; Gawlitzek-Maiwald & Tracy, 1996). The similar sentence structures between Spanish and English may support across-language associations in syntactic bootstrapping. If this is the case, a stronger correlation in syntactic bootstrapping might also be expected between languages that have more overlapping syntactic structures relative to languages that have limited overlapping syntactic structures.

Still, there was a positive association between children's *Fast Mapping* performance across-languages in the study, suggesting similarities in how children learn new nouns in both English and Spanish. The fast mapping task in this study required participants to comprehend a single object-word association, however it was impossible to completely isolate the novel word without providing some semantic and syntactic content that varied. For example, one phrase in Spanish asked children to identify a novel word-object association within the context of types of flowers (e.g., la teña es un tipo de flor; English translation: the teña is a kind of flower). Although the structures were equivalent and designed to be relatively independent of children's vocabulary knowledge in each language, it was impossible to make the task completely language neutral. Therefore, it relied to a minimal extent on whether children knew the content words, such as "tipo / kind" "flor / flower," and had knowledge of syntax structure. Syntactic and semantic information in the noun learning task may account for the association we found across-languages in *Fast Mapping*, though the correlation was weaker than in *Syntactic Bootstrapping.* Nonetheless, the fact that we identified a significant across-linguistic association suggests that the DLL's process of mapping a novel label to an unfamiliar object may still be similar across languages.

Our analyses of vocabulary and word learning associations revealed significant within-language correlations, which were consistent with previous literature that suggest existing vocabulary supports word learning within a language. Across-language associations were revealed between existing English vocabulary and Spanish word learning processes; in contrast, Spanish vocabulary was not significantly correlated with English word learning processes. These results are somewhat contradictory, given that children's early Spanish knowledge is known to support later English development in children exposed to Spanish in the home (Hoff et al., 2012). However, one difference between this study and Hoff et al. 2012 is age of participants. Monolingual and bilingual participants were aged 20-30 months in Hoff et al.'s 2012 study. Participants of this study were preschool-aged. By preschool, children may have developed a foundation in English exposure sufficient to support Spanish development, and such exposure would be accumulated for children of older preschool ages.

To test for this, we calculated the difference between Spanish and English overall scores for each participant. Each participant's overall score was a mean of all items across the 12 subtest on the QUILS:ES. Participants were split into three age groups (3;0-3;11 year olds, 4;0-4;11 year olds, and 5;0-5;11 year olds) and the difference between Spanish and English overall scores was compared between groups. Results revealed that the 3-year old age group's Spanish overall score was higher than their English overall score [Mean Spanish overall=.3565, Mean English overall=.3473] and the 4-year old age group's English overall score was higher than their Spanish overall score [Mean Spanish overall=.4239, Mean English overall=.4343]. However, neither difference was significant. In contrast, the 5-year old age group demonstrated significantly higher English overall scores that Spanish overall scores [Mean Spanish overall=.5193, Mean English overall=.5721; $t(132)=3.297$, $p=.001$]. Although the difference in

English and Spanish overall scores was only significant in the 5-year old group, the differences between age groups were significant [$F(2, 358)=3.753$, $p=.024$]. This is consistent with literature that supports that children with increased exposure to their L2 may eventually become more proficient in their L2 relative to their L1, particularly if their L2 is the majority language (i.e., language spoken by most people in their society). Differences in overall language scores between age groups in this study may account for why English vocabulary supported Spanish word learning whereas Spanish vocabulary was not associated with English word learning.

These differences between age groups may also account for why age was a significant predictor for performance in all word learning processes excluding Spanish syntactic bootstrapping. Previous literature suggests that children have greater difficulty acquiring novel action words relative to novel object words (Imai et al., 2008), and such challenges may persist beyond the preschool age. This may have resulted in age not being a significant predictor for Spanish syntactic bootstrapping, as preschool-aged children from ages 3-5 years in this study may have had similar difficulties acquiring novel action words. However, age was still a significant factor for predicting English syntactic bootstrapping performance, perhaps due to variations in exposure to both languages between age groups. Recall that there were significant differences between age groups in overall English scores and overall Spanish scores, with the 5-year old age group having significantly higher overall English scores compared to their Spanish scores perhaps due to cumulative increased exposure and opportunities to engage in English word learning compared to younger age groups. In contrast, exposure and opportunities to engage in Spanish word learning may have been similar between age groups in this study. If this were the case, it might be expected that age be a predictor for English syntactic bootstrapping

and not Spanish syntactic bootstrapping. Future studies should account for changes in exposure to both languages as a DLL ages in examining factors influencing word learning processes.

Although age was not a consistent predictive factor for word learning performance, *Noun Vocabulary* predicted *Fast Mapping* and *Verb Vocabulary* predicted *Syntactic Bootstrapping* within-languages in both Spanish and English. Vocabulary as a predictor for word learning within-language aligned with previous literature that suggest existing vocabulary supports word learning.

As expected, vocabulary was generally not a predictive factor for word learning across-languages, which corroborates with evidence of DLLs developing distributed vocabularies. However, English *Verb Vocabulary* predicted Spanish *Syntactic Bootstrapping*, suggesting there may still be some across-language associations between vocabulary and word learning. Mixed results in this study of across-language predictive factors is consistent with previous literature that there may be some across-language influence in applying existing vocabulary knowledge in one language to word learning in another (Bilson et al., 2015; De groot & Keijzer, 2000; Costa et al., 2005). Again, results of this study may be partially explained by analysis demonstrating that differences in overall English and Spanish scores differed between age groups with the 5-year old age group having significantly higher overall English scores. Future studies should continue to explore how language exposure may influence the level of across-language associations in vocabulary and learning.

Together, these results can be interpreted within current frameworks for understanding bilingual language development. There are many factors that may influence word learning, and various models of word learning attempt to explain how children acquire language. For example, phonotactic probability is the probability of occurrence of speech sounds within syllables and

words of a language, and different languages hold different phonotactic probabilities. There is evidence children rely on statistical regularity within the speech they hear to support word learning (Saffran, Newport, Aslin, Tunick, & Barrueco, 1997). Such patterns are likely to influence word learning processes across-languages as well, in that across-language word learning may be more strongly associated if the two languages have overlapping phonotactic probability (Alt et al., 2013).

In addition to phonology, other comprehensive models of word learning, such as the framework Processing Rich Information from Multi-dimensional Interactive Representations (PRIMIR) suggest that children filter rich information in speech to support language learning (Werker & Curtain, 2005). For example, according to Werker and Curtain 2005, children may perceive differences in pitch and identify child-directed speech. They then process information based on cognitive interactions, such as developmental level and initial biases. Such complex interactions are particularly applicable for a DLL exposed to two separate languages, in that PRIMIR suggests semantic-lexical information can be organized by clustering words with shared meaning both within and across languages. Therefore, as a model for early bilingual language development, PRIMIR may provide a framework for how young DLLs can acquire separate yet overlapping lexical-semantic networks (DeAnda, Poulin-Dubois, Zesiger, & Friend, 2016).

Results from the present study suggest that complex interactions in DLL language acquisition may be at play. Specifically, across-language associations were revealed yet inconclusive (i.e., English *Verb Vocabulary* predicted Spanish *Syntactic Bootstrapping,* yet Spanish *Verb Vocabulary* did not predict English *Syntactic Bootstrapping*). Future research needs to control for other variables that can influence word learning, such as phonotactic

probability and language exposure, to further investigate across-language associations in word learning.

Summary and Implications of Post-Hoc Analyses

Post-hoc analyses were conducted to further examine across- and within-language associations between vocabulary and word learning. No significant differences were revealed for vocabulary and word learning performance between sexes (male and female), which was consistent with previous literature that suggest sex differences in young children's language development are limited and may not persist beyond 36 months of age. When comparing vocabulary and word learning between different age groups (e.g., 3-year olds, 4-year olds, and 5-year olds), significant differences between groups were found for all factors. Previous literature also supports differences in word learning performance and vocabulary knowledge between different age groups, particularly in early years of language development (Vlach & Sandhofer, 2011).

Given that exposure to each language can be vastly different from one individual to another and may impact vocabulary and word learning, differences in vocabulary and word learning in both languages were analyzed when comparing children receiving various levels of language input. A subset of participants were categorized into one of three groups via a parent questionnaire: English Dominant, Balanced Bilingual, or Spanish Dominant. Overall, analyses indicated that children who received more input in English tended to have higher scores in English (as indexed by significant differences between language dominance groups); and children who received more input in Spanish tended to have higher scores in Spanish. These findings are also consistent with a large body of evidence showing that input is a strong predictor of language development (Hart & Risley, 1995; Hoff, 2003).

Another factor that may impact vocabulary and word learning is SES. Participants of this study were primarily from low-SES communities and mid-SES communities. To compare these two groups, a subset of participants were matched based on age and sex. There were significant differences between the two groups in both English and Spanish word learning processes; however, there were no significant differences between the two groups in vocabulary knowledge. The lack of significant differences in vocabulary between SES groups conflict with previous studies that suggest children from lower SES backgrounds have reduced vocabularies compared to higher SES peers (Hart & Risley, 1995; Hoff, 2003; Rowe, 2012). Previous studies have also suggested that underlying word learning processes are not different between SES groups (Balladares, Marshall, & Griffiths, 2016; Campbell, Dollaghan, Needleman, & Janosky, 1997). However, such studies focused on cognitive processes such as attention, memory, and executive function thus potentially eliminating the linguistic aspects of word learning (Weismer & Evans, 2002). There is literature that supports differences in word learning processing between SES groups when linguistic contexts are taken into account (Fernald et al., 2013; Huang, Leech, & Rowe, 2017).

Results of this study were consistent with literature supporting differences in word learning processing in young children from lower SES backgrounds compared to peers from higher SES backgrounds, and further demonstrate differences specifically in noun and verb learning in both Spanish and English for DLL children. However, results were inconsistent with evidence supporting gaps in vocabulary knowledge between children of different SES groups. This may have been due to limited variance in participant SES (i.e., participants were either low-SES or mid-SES), or the method of measurement for vocabulary knowledge in this study, which was a receptive language screener of common words as the QUILS:ES is not meant to be a

comprehensive evaluation of vocabulary knowledge. Further, only noun and verb vocabulary knowledge was examined in this study. Other parts of speech, such as adjectives, adverbs, and prepositions, were excluded. If such vocabulary knowledge gaps exist in DLLs of different SES groups, they may have been revealed through different methods of measurement, across greater SES gaps, or when vocabulary of all parts of speech are taken into account.

Limitations

This study aimed to explore the across- and within-language interactions of vocabulary and word learning processes in preschool aged DLLs exposed to Spanish and English. A computer-administered screener, the QUILS:ES, was used to assess participants' language skills. The QUILS:ES has high internal consistency reliability, strong test-retest reliability, and convergent validity which was evaluated with bilingual administration of the Preschool Language Scales-5 (Iglesias et al., in preparation). However, this new tool may not completely capture language ability as it excludes expressive language skills and other methods to assess receptive language (e.g., parent reported vocabulary). Future studies should include other methods of language assessment to more completely capture how a DLL acquires language.

To assess noun word learning, QUILS:ES scoring included the extension trials in which participants applied the newly acquired word to identify an object. Participants who were incorrect during the extension trials were scored as incorrect for the entire word learning trial. Some children may have successfully fast mapped the novel word in the initial word learning trial but not successfully extended the novel word, thus affecting their word learning scores. Future studies should separate fast mapping from extending, as they are separate skills in the word learning process. Examining such skills separately may provide greater insight into the word learning process in DLLs.

Although the current research only included typically developing children, there was no direct measure of cognitive ability, which affects word learning abilities (Dollaghan, 1987; Rice, Buhr, & Nemeth, 1990). Therefore, analyses could not be conducted with respect to cognitive skill. Thus, this study cannot verify whether results would be better explained by general cognitive skills. Given the role cognition plays in word learning, future studies should assess cognitive skills of DLLs to examine whether across- and within-language associations can be explained by cognitive ability.

Lastly, this study collected and analyzed language exposure on a subset of participants by examining quantity of exposure in each language as measured by parent report. However, quantity of language exposure in itself may not completely describe a child's experience with a language. Other qualitative factors of language input, such as diversity of speakers and child-direct language, affect a child's proficiency with a language. A deeper investigation of language input using direct measures of the home language environment would contribute to a more complete understanding of how DLLs acquire language.

Conclusion

Together, these findings reveal a complex pattern of within- and across-language associations in Spanish and English word learning and vocabulary knowledge in preschool aged DLLs. Further, variations in exposure due to factors such as SES and quantity of language input appeared to affect the level and direction of across-language associations. The implication that such external factors may affect word learning is important given the heterogeneity of DLLs language learning experiences. A deeper understanding of language acquisition in young typically developing DLLs that considers both the child's word learning capacity and the dual language learning environment is critical to support development in both languages, as well as

improve early assessment and intervention for DLLs with non-typically developing language skills.

Appendix A. Language Questionnaires

Language Questionnaire, English p. 1

University of Delaware Date of Birth:_____

Survey

Please write your answer in the space provided. *The purpose of these questions is to help us better understand the results of our studies. Your answers will not affect your child's participation in the study and all answers are confidential. We thank you for taking your time to do this for us!*

Child's name:_____

Optional	
Is your child Hispanic/Latino/a?	***Yes No***
What is your child's race? (you can select multiple)	***White, Black/African-American, American Indian/Alaska Native, Asian, Hawaiian native/Other Pacific islander, Other (please specify):*** _____

Your relationship to the child:_____

How many children under 18 live in this child's household?_____

How many adults live in the child's household?_____

Who is the child's primary caregiver?_____

Is there a second caregiver? Relationship (*If no, please skip questions in grey (2, 10, 13)*):_____

Please put a check mark in the box next to your answer

1. What is the highest level of education of the child's **primary caregiver?**
   - ☐ Some high school
   - ☐ High school diploma
   - ☐ Trade school (auto repair, cosmetology)
   - ☐ Bachelor's Degree
   - ☐ Graduate Degree (masters, PhD)
   - ☐ I don't know

2. What is the highest level of education of any **second caregiver?**
   - ☐ Some high school
   - ☐ High school diploma
   - ☐ Trade school (auto repair, cosmetology)
   - ☐ Bachelor's Degree
   - ☐ Graduate Degree (masters, PhD)
   - ☐ I don't know

3. How many **times a week** is the **child read** to at home?
   - ☐ 0 times
   - ☐ 1-3 times
   - ☐ 4-7 times
   - ☐ More than 7 times
   - ☐ I don't know

4. How **long** is the child usually **read to** during **story time**?
   - ☐ 1-5 minutes
   - ☐ 5-15 minutes
   - ☐ 15-30 minutes
   - ☐ More than 30 minutes
   - ☐ I don't know

5. How many **books** does the child have at home?
   - ☐ 0-5 books
   - ☐ 5-10 books
   - ☐ 10-20 books
   - ☐ 20-30 books
   - ☐ More than 30 books
   - ☐ I don't know

6. On an average day, how long does the **child watch TV**?
   - ☐ no TV watching
   - ☐ 1-30 minutes
   - ☐ More than 4 hours
   - ☐ 1-4 hours
   - ☐ 30-60 minutes
   - ☐ I don't know

Please see reverse side→

University of Delaware

7. *Please answer this question if your child has daily access at home to any of the following: **smartphone, computer, videogames**.* How long does your child spend on **interactive screen time**?

☐ no interactive screen time ☐ 1-30 minutes ☐ 30-60 minutes
☐ 1-4 hours ☐ More than 4 hours ☐ I don't know

8. What languages other than English does the child hear adults speaking at home? _____

8a. If Spanish, what type(s) of Spanish does your family speak? (Cuban, Mexican, Dominican, Puerto Rican, etc.)

_____

9. What language does the **primary caregiver** use when **speaking** to the child?

Only English	Mostly English	English and another language	Mostly other language	Only other language
☐	☐	☐	☐	☐

10. What language does any **second caregiver** use when speaking to the child?

Only English	Mostly English	English and another language	Mostly other language	Only other language
☐	☐	☐	☐	☐

11. If there are **siblings**, what language do they use when **they speak** to the child?

Only English	Mostly English	English and another language	Mostly other language	Only other language
☐	☐	☐	☐	☐

12. What language does the **child** use when talking to the **primary caregiver** at home?

Only English	Mostly English	English and another language	Mostly other language	Only other language
☐	☐	☐	☐	☐

13. What language does the **child** use when talking to any **second caregiver** at home?

Only English	Mostly English	English and another language	Mostly other language	Only other language
☐	☐	☐	☐	☐

14. What language does **the child** use when talking to **siblings** at home?

Only English	Mostly English	English and another language	Mostly other language	Only other language
☐	☐	☐	☐	☐

15. What language does the **child** use when talking to friends **outside** the home?

Only English	Mostly English	English and another language	Mostly other language	Only other language
☐	☐	☐	☐	☐

Thank you so much for filling out our survey! Please return this form to your child's teacher.

Language Questionnaire, Spanish p. 1

University of Delaware Fecha de nacimiento:_____

Encuesta

Por favor, escriba su respuesta en el espacio provisto. El objetivo de estas preguntas es para poder entender mejor los resultados de nuestros estudios. Sus respuestas no van a afectar la participación de su niño en el estudio y usted debe saber que todas las respuestas serán mantenidas confidencialmente. ¡Gracias por tomarse el tiempo para rellenar esta encuesta!

Nombre de su niño/a _____

Opcional	
¿Su niño/a es hispano/a/Latino/a?	***Sí No***
¿Cuál es la raza de su niño/a? (Se puede escoger más de uno.)	***Blanca, Negra/Afroamericana, Asiatica, Nativo de América del Norte/Nativo de Alaska, Nativo de Hawaii/Otro pais del Pacífico, Otra (por favor, explique):_____***

Su parentresco con el/la niño/a:_____

¿Cuántos niños menores de 18 años viven en la casa con el/la niño/a?_____

¿Cuántos adultos viven en la casa de el/la niño/a?_____

¿Quién es el adulto que pasa más tiempo cuidando a el/la niño/a (su relación)?_____

¿Hay otro adulto que pasa mucho tiempo cuidando a el/la niño/a? ¿Cual es su relación a el/la niño/a (*Si la resuesta es "no," brinque las preguntas 2, 10, 13 en gris)*:_____

Por favor, ponga un visto en la casilla al lado de su respuesta.

1. ¿Cuál es el nivel más alto de educación alcanzado por **el adulto que pasa más tiempo** con el/la niño/a?
   - ☐ Escuela secundaria sin terminar
   - ☐ Título de bachillerato o GED
   - ☐ Escuela especializada (como cosmetología, taller de auto)
   - ☐ Licenciatura (de 4 años)
   - ☐ Licenciatura (maestría o doctorado)
   - ☐ No sé
2. ¿Cuál es el nivel más alto de educación alcanzado por cualquier **otro adulto que pasa tiempo** con el/la niño/a?
   - ☐ Escuela secundaria sin terminar
   - ☐ Título de bachillerato o GED
   - ☐ Escuela especializada (como cosmetología, taller de auto)
   - ☐ Licenciatura (de 4 años)
   - ☐ Licenciatura (maestría o doctorado)
   - ☐ No sé
3. ¿Cuántas **veces semanalmente** se le **lee** al **niño/a** en la casa?
   - ☐ 0-1 veces
   - ☐ 2-3 veces
   - ☐ 3-4 veces
   - ☐ 5-6 veces
   - ☐ 6-7 veces
   - ☐ No sé
4. ¿Durante **cuánto tiempo** se le **lee** a **su niño/a** durante el dia.
   - ☐ 0-15 minutos
   - ☐ 15-30 minutos
   - ☐ 30-45 minutos
   - ☐ 45-60 minutos
   - ☐ Más de 60 minutos
   - ☐ No sé
5. ¿Cuántos **libros** tiene su niño/a en casa?
   - ☐ 0-5 libros
   - ☐ 5-10 libros
   - ☐ 10-20 libros
   - ☐ 20-30 libros
   - ☐ Más de 30 libros
   - ☐ No sé
6. En promedio, ¿cuánto tiempo pasa su niño/a **mirando la TV** diariamente?
   - ☐ 0-30 minutos
   - ☐ 30-60 minutos
   - ☐ 1-2 horas
   - ☐ 2-4 horas
   - ☐ Más de 4 horas
   - ☐ No sé

Por favor, vea el reverso→

University of Delaware

7. *Por favor, conteste esta pregunta si su niño/a tiene acceso diaramente en casa a cualquiera de los siguiente:* ***smartphone, computadora, videojuegos***. ¿Cuánto tiempo pasa su niño/a en la pantalla interactiva?

☐ no tiempo en pantalla ☐ 1-30 minutos ☐ 30-60 minutos
☐ 1-4 horas ☐ Mas de 4 horas ☐ No sé

8. ¿Qué idioma oye el/la niño/a hablar en su casa? _____
8a. Si escribió español, ¿qué tipo(s) de Español habla su familia? (Por ejemplo: cubano, mexicano, dominicano, puertoriqueño, etc) _____

9. ¿Cuál idioma usa **el adulto que pasa más tiempo con el/la niño/a** cuando **habla** con el/la niño/a?

Sólo inglés	Generalmente inglés	Inglés y otro idioma	Generalmente otro idioma	Sólo otro idioma
☐	☐	☐	☐	☐

10. ¿Cuál idioma usa **el otro adulto que pasa tiempo con el/la niño/a** cuando **habla** con el/la niño/a?

Sólo inglés	Generalmente inglés	Inglés y otro idioma	Generalmente otro idioma	Sólo otro idioma
☐	☐	☐	☐	☐

11. Si hay **hermanos**, ¿cuál idioma usan ellos cuando **hablan** con el/la niño/a?

Sólo inglés	Generalmente inglés	Inglés y otro idioma	Generalmente otro idioma	Sólo otro idioma
☐	☐	☐	☐	☐

12. ¿Cuál idioma usa **el/la niño/a** cuando habla con **el adulto que pasa más tiempo con el/la niño/a** en casa?

Sólo inglés	Generalmente inglés	Inglés y otro idioma	Generalmente otro idioma	Sólo otro idioma
☐	☐	☐	☐	☐

13. ¿Cuál idioma usa **el/la niño/a** cuando habla con **el otro adulto que pasa tiempo con el/la niño/a** en casa?

Sólo inglés	Generalmente inglés	Inglés y otro idioma	Generalmente otro idioma	Sólo otro idioma
☐	☐	☐	☐	☐

14. ¿Cuál idioma usa **el/la niño/a** cuando habla con **sus hermanos** en casa?

Sólo inglés	Generalmente inglés	Inglés y otro idioma	Generalmente otro idioma	Sólo otro idioma
☐	☐	☐	☐	☐

15. ¿Cuál idioma usa **el/la niño/a** cuando habla con sus amigos **fuera** de la casa?

Sólo inglés	Generalmente inglés	Inglés y otro idioma	Generalmente otro idioma	Sólo otro idioma
☐	☐	☐	☐	☐

¡Gracias por rellenar nuestra encuesta! Por favor, devuelva este formulario al maestro de su niño.

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