Validity of a Dynamic Spanish Assessment of Phonological Awareness in Emergent Bilingual Children

Kelsey R. Wyman Chin

University of South Florida, kwymanchin@gmail.com

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Validity of a Dynamic Spanish Assessment of Phonological Awareness in Emergent Bilingual Children

by

Kelsey R. Wyman Chin

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
Department of Communication Sciences and Disorders
College of Behavioral and Community Sciences
University of South Florida

Major Professor: R. Michael Barker, PhD.
Committee Members: Maria R. Brea-Spahn, Ph.D., CCC-SLP
Kyna S. Betancourt, PhD., CCC-SLP

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Abstract

Within the current decade, the number of Hispanic students has doubled so that about 16% of the total student population within the United States are Spanish-speakers (U.S. Census Bureau, 2017). With this growing population comes a responsibility to understand and implement best practices for educating these students. Because literacy is a building-block for learning, one integral part of this responsibility consists of developing valid and reliable means of assessing pre-reading skills that are predictive of later reading abilities (Lonigan, Burgess, & Anthony, 2000; Wagner, Torgesen, & Rashotte, 1994).

English-language learning children are being identified for having reading difficulties and disabilities two to three years later than their English-proficient peers (Chu & Flores, 2011). As a population, they are also overly misidentified as having reading difficulties/disabilities and being unnecessarily placed into a special education system (McCardle, Mele-McCarthy, Cutting, Leos, & D’Emilio, 2005b; Santullova Allison & Robinson-Young, 2016). Per a nationwide survey of Speech-Language Pathologists, one large contributing factor for this dilemma is the lack of appropriate assessment instruments (Roseberry-McKibbin, Brice, & O’Hanlon, 2005).

Phonological awareness is the ability to focus on and manipulate units of spoken language (words, syllables, onsets, rimes, and/or phonemes). It is one of the most significant predictors of later reading abilities. A large body of evidence provides support for this within the English language but also within other alphabetic languages, such as Spanish (e.g. Carillo, 1994; Durgunoglu, Nagy, Hancin-Bhatt, 1993; Schneider, Kuspert, Roth, Vise, & Marx, 1997). Thus, assessments of phonological awareness have been shown to be reliable measures that predict later reading abilities in Spanish-speaking children and English-proficient children alike (Farver, Nakamoto, & Lonigan, 2007).
There are many standardized assessments available to test phonological awareness as an emergent literacy skill in English. In congruence with the previously mentioned nationwide survey, Spanish assessments of phonological awareness are less abundant. Additionally, these tests tend to be expensive, time-consuming to give, and require training of the administrator. These tests are static in nature and regularly require the child to comprehend complex administrative instructions which is often problematic for children with limited language skills in Spanish and/or English (Barker, Bridges, & Saunders, 2014).

The current study aims to build upon existing data regarding development of the DAPA-S by evaluating the validity of a shorter version of the DAPA-S (the DAPA-S Short Form) with children from Spanish-speaking backgrounds. The DAPA-S Short form was designed with the purpose of retaining all the test items of the full version but with an altered structure which allows for significantly shorter administration time. The DAPA-S and the shorter version were both designed as Spanish dynamic assessments of phonological awareness which are computerized, have simple instructions, provide information about a child’s ability to learn from instruction, and do not require speech responses.

The twelve participants that were involved in this study were given the DAPA-S Short Form as well as other assessments related to phonological awareness or emergent reading. Three of those participants did not complete the study due to poor attendance or behavioral challenges. Therefore, this study reports on nine participants who completed the full assessment battery.

To investigate concurrent validity, correlational analysis was performed with the DAPA-S Short Form scores and scores from a measure of phonological awareness, the Test of Phonological Sensitivity in Spanish (TOPSS; Brea, Silliman, Bahr, & Bryant, 2003). The Elision, Rapid Automatic Naming, and Letter Name/ Letter Sound subtests from the TOPSS
were administered. No significant correlations were observed between either subtest from the DAPA-S Short Form and any of the subtests from the TOPSS ($r = .49$ for Elision, $r = .36$ for RAN, $r = .43$ for Letter Name/Letter Sound subtests). Therefore, concurrent validity was not established as measured in this study.

To investigate convergent validity, correlational analysis was performed with the DAPA-S Short Form subtests and the scores from a measure of Spanish emergent reading skills, the Letter-word Identification (LWID) subtest from the Woodcock-Muñoz Language Survey – Revised (WMLS-R; Woodcock, Muñoz – Sandoval, Ruef, & Alvarado, 2005). Significant correlation was observed between the First Syllable subtest of the DAPA-S Short Form and the test of emergent literacy ($r = .87$, $p < .01$); no significant correlation was observed for the Last Syllable subtest of the DAPA-S Short Form ($r = .44$) and the test of emergent literacy. Therefore, the First Syllable subtest from the DAPA-S Short Form demonstrates good convergent validity, while the Last Syllable subtest did not.

Data suggests that the DAPA-S Short Form demonstrates excellent internal reliability (Cronbach’s alpha = .99 for both subtests) but requires modifications and further testing with a larger sample size in order to be considered as a valid measure of phonological awareness. If developed through further research, the DAPA-S Short Form as well as the full version of the assessment could prove to be invaluable tools in educational and clinical settings.
Chapter 1: Literature Review

Spanish-speaking Population Within the United States

According to the United States Census Bureau (2017), the Hispanic population accounts for 17.9 percent of the total population, with 73.3 percent of Hispanics ages 5 and older speaking Spanish at home. From the year 1996 to 2016 (within 2 decades), the number of Hispanic students enrolled in all levels of schooling from preschool to universities throughout the United States has doubled from 8.8 million to 17.9 million. Hispanic students now constitute 22.7 percent of the total student population. United States Census Bureau demographers project that the number of Spanish Speakers will be between 37.5 to 41 million in the year 2020 (Ortman & Shin, 2011). It is evident that the population of students who are Spanish-speaking English-language learners (also referred to here as Emergent Bilinguals) within the United States has grown tremendously and will continue to grow in years to come. Although an increase in school enrollment of Hispanics can be seen within the past two decades, there are still noteworthy educational gaps. For example, the ratio of Hispanic adults who have not attained a high-school diploma is higher than non-Hispanics and the percentage of Hispanics who attend graduate or professional school continues to lag behind that of other groups (United States Census Bureau, 2017).

In order to remedy these educational gaps, many resources have been geared toward understanding and implementing the necessary adjustments that accompany such a large shift in population demographics. Within these efforts, numerous research studies have been put forth to investigate best practices for educating Spanish-speaking students who are being taught in an
English-based school system. Not surprisingly, much of this research centers around the subject of literacy (reading and writing) as it is the basis for making informed decisions, actively participating in a literate society, and acquiring new knowledge (Stromquist, 2005). Well-developed literacy skills are necessary to create a strong foundation for learning, encourage children to remain on track in school, graduate, and pursue upper-level education and training (Cunningham & Stanovich, 1997; Echols, West, Stanovich, & Zehr, 1996; Lonigan et al., 2000; Morrison, Smith, & Dow-Ehrensberger, 1995). In order to determine how to best support literacy skills in emergent bilingual students, it is first necessary to understand how these skills develop.

**Development of Literacy Skills**

Contrary to a traditional view that begins to examine a child’s reading skills at the start of reading instruction, development of reading skills has been shown to begin well before entry into kindergarten (Lonigan et al., 2000). The area of study regarding early literacy skills is often referred to as emergent literacy. There are ample research studies that support the idea that the preschool period is of critical importance in the development of the prerequisite skills for reading (e.g. Shonkoff & Phillips, 2000; Wagner, Torgesen, & Rashotte, 1994). To that end, these prerequisite skills have been shown to be strong predictors of reading success once children begin to receive formal reading instruction (Wagner, Torgesen, Rashotte, Hecht, Barker, & Burgess, 1997).

There are three fundamental preschool skills that have been identified to be predictive of a child’s later success in reading. These indicators are phonological awareness, alphabet knowledge, and oral language (Adams, 1990; Anderson, Hiever, Scott, & Wilkerson, 1985; Lonigan, 2006; National Institute of Child Health and Human Development, 2000; Scarborough, 1998; Snow, Burns, & Griffin, 1998;). **Phonological awareness** is the ability to hear and
manipulate units of spoken language (e.g., words, syllables, onsets, rimes, and phonemes).

*Alphabet knowledge* is the understanding that words are made up of letters and each letter or group of letters corresponds to a sound (Lonigan et al., 2000). *Oral language* refers to vocabulary and grammar (Bryne & Fielding-Bamsley, 1991; Stanovich, 1992). In essence, to be able to read, children must recognize that each word that they hear is made up of different sounds, the sounds can be manipulated to make different words which have meaning, and that each sound is represented by specific letters and letter combinations (Adams, Foorman, Lundberg, & Beeler, 1998). These three emergent literacy skills have been shown to be related, interactive with one another, and important for development of good reading comprehension (Justice, Invernizzi & Meier, 2002). However, researchers have agreed that skills related to phonological processing (phonological awareness and alphabet knowledge) are significantly more important for decoding (sounding out words from text) than oral language skills (Dickinson & Snow, 1987; Lonigan et al., 2000; Senechal & LeFevre, 2002; Shatil & Share; 2003; Storch & Whitehurst, 2002). Consequently, it is important to caution against using a child’s oral language proficiency to predict reading abilities and, instead, place more predictive responsibility on phonological awareness and related skills (Durgunoglu et al., 1993; Moll & Diaz, 1985).

**Phonological Awareness**

There is a large body of evidence to support phonological awareness as a prerequisite for literacy acquisition across alphabetic languages (e.g. Bradley & Bryant, 1983; Bryant, Maclean, Bradley, & Crossland, 1990; Hoien, Lundberg, Stanovich, & Bjaalid, 1995; Lundberg, Frost, & Peterson, 1998; Schneider, Kuspert, Roth, Vise, & Marx, 1997). An alphabetic language, such as English, Spanish, or German, is one that uses a standard set of letters to represent significant sounds of spoken language. Furthermore, the development of phonological awareness has been
shown to follow a typical sequence of development (i.e. awareness of syllables, then onset-rime, and lastly, individual phonemes) across alphabetic languages (Ziegler & Goswami, 2005). The development of phonological awareness in Spanish has been understudied, but it is believed to develop similarly to phonological awareness in English, in part because it is similarly related to reading outcomes. Studies that have investigated this link have focused on cross-language transfer (the impact of phonological awareness in one language on another language).

In 1993, one such study was conducted by researchers Durgunoglu, Nagy, and Hacin-Bhatt, who looked at the relationship between Spanish phonological awareness and English word recognition tasks. Participants were Spanish-speaking beginning readers. They administered tests of letter naming, Spanish phonological awareness, Spanish and English word recognition, and proficiency in Spanish and English oral language. The study concluded that children who performed well on tests of Spanish phonological awareness were more successful in reading English words/pseudowords than children who performed poorly. In other words, their conclusions supported cross-language transfer [L1 (Spanish) to L2 (English)] of phonological awareness since phonological awareness in Spanish could significantly predict a child’s word recognition abilities in both Spanish and English. Additionally, neither English nor Spanish oral language proficiency had significant effects on word-identification tasks. Results from other studies that detail interventional methods which focus on phonological awareness and related skills have also supported evidence of cross-language transfer from Spanish to English (Farver, Lonigan, & Eppe, 2009; Lonigan, Schatschneider, & Westberg, 2007).

**Assessment of Emergent Literacy Skills**

Early identification of children who are at risk for reading difficulties or reading disabilities is the first step in providing needed support or intervention. Children who have
difficulties learning to read early on can develop maladaptive behaviors (guessing, faking reading, avoiding reading, etc.) (Clay, 1987). These struggling readers will likely continue to experience difficulties during later school years, especially when teaching shifts away from explicit reading instruction and toward providing content knowledge that relies on a steady foundation of literacy skills (Clay, 1987; Farver, Nakamoto, & Lonigan, 2007; Hougen, 2014; Lonigan, 2006; Lonigan et al., 2000).

Early identification of struggling readers is emphasized because prevention of reading difficulties produces better results and is more cost effective than remediation of reading difficulties (Berninger, Abbott, Verneulen, Ogier, Brooksher, & Zook, 2002; Coyne, Kame’enui, Simmons, & Harn, 2004; Torgesen, 2000). Longitudinal studies have shown that an individual’s emergent literacy skill level (including phonological awareness) remains stable up to the fourth grade and can serve to predict later reading abilities (Farver et al., 2007; Wagner et al., 1997; Wagner, Francis, & Morris, 2005). Thus, it is important that children who may be at risk for reading difficulties can be assessed and accurately identified during preschool years. Despite this, English-proficient children with learning disabilities are generally being identified and provided with needed support as late as the second or third grade (McCardle, Mele-McCarthy, Cutting, Leos, & D’Emilio, 2005b; McCardle, Mele-McCarthy, & Leos, 2005a). Emergent Spanish-English bilingual children are being identified two to three years later than this, in the fourth to sixth grade (McCardle et al., 2005b; McCardle et al., 2005a). Furthermore, emergent Spanish-English bilingual children are also often being mis-identified for having reading difficulties and disabilities and unnecessarily being placed into a special education system which does not exercise their greatest learning potential (Chu & Flores, 2011).
It is hard to pinpoint which factor contributes most to the untimely identification or misidentification of at-risk emergent bilingual children; however, there are a few factors worth mentioning. Children who are learning English as a second language display some of the same oral language characteristics as children with learning disabilities (for example, poor comprehension of verbal directions, errors in verbal expression, etc.) (Durgunoglu et al., 1993). As noted, early oral language skills have little effect on early reading abilities even within the same language. Although much has changed in recent years, it is alarming that a survey given in 1987 found that 92-94% of school districts used student’s English oral proficiency to make entry and exit decisions from bilingual education programs (Durgunoglu et al., 1993; Fradd, 1987).

Roseberry-McKibbin, Brice and O’Hanlon (2005) conducted a nationwide survey of speech-language pathologists within the public-school system. This survey inquired about difficulties they faced in providing services to English Language Learners. Based on the perceived responses to this survey “don’t speak the language of the children,” “lack of appropriate assessment instruments,” and “lack access to other professionals who speak children’s languages” were the three most frequent concerns (Chu & Flores, 2011; Roseberry-McKibbin et al., 2005). There are some laws in place to ensure unbiased testing for all children. For example, the Individuals with Disabilities Act mandates that a child should be assessed in their native language by qualified personnel. It also states that assessments should be nonbiased and non-discriminatory (Individuals with Disabilities Education Improvement Act of 2004). Roseberry-McKibbin et al. (2005) suggest four guidelines to ensure nonbiased assessment:

1. Testing and evaluation materials and procedures must be selected and administered in a nondiscriminatory manner.
2. Testing and evaluation materials must be provided and administered in the language or other mode of communication in which the child is most proficient.

3. Tests must be administered to a child with a motor, speech, hearing, visual, or other communication disability, or to a bilingual child, so as to reflect accurately the child’s ability in the area tested, rather than the child’s impaired communication skill or limited English language skill.

4. Accommodations may include alternative forms of assessment and evaluation.

**Current Assessments that Test Phonological Awareness**

Standardized assessments of phonological awareness exist in both English and Spanish. However, many of these instruments tend to be expensive, time-consuming to give, and require training of the administrator. Relative to the tests available in English, few of these exist in Spanish. Furthermore, none of these instruments are designed for use with emergent bilingual children who have speech or other communication disabilities.

Assessments of phonological awareness typically include word rhyming, sound-matching, elision, blending, segmenting, and substitution. Examples of these can be seen in Table 1. English tests that are commonly used to test preschool children include the Comprehensive Test of Phonological Awareness, Second Edition (CTOPP-2; Wagner, Torgesen, Rashotte, & Pearson, 2013), the Phonological Awareness Test - 2nd edition (PAT 2; Robertson & Salter, 2007a), and the Test of Phonological Awareness - 2 (TPA-2; Togesen & Bryant, 2004). Commonly used Spanish test options include the Test of Phonological Processing in Spanish (TOPPS; Francis, Carlo, August, Kenyon, Malabonga, Caglarcan, & Louguit, 2001), the Test of Phonological Awareness in Spanish (TPAS; Riccio, Imhoff, Hasbrouck, & Davis, 2005). All of
these tests require verbal responses and would not be appropriate for children who have limited verbal output.

Table 1  
Typical Phonological Awareness Tasks

<table>
<thead>
<tr>
<th>Phonological Awareness Tasks</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhyming</td>
<td>Do ‘cat’ and ‘bat’ rhyme?; Which does not rhyme? ‘cat, bat, kit’; Tell me a word that rhymes with sock</td>
</tr>
<tr>
<td>Sound-Matching</td>
<td>Point to the picture that begins with the same letter as ‘sock’</td>
</tr>
<tr>
<td>Elision</td>
<td>Say 'bat'. Now say ‘bat’ without the /b/</td>
</tr>
<tr>
<td>Blending</td>
<td>What words do these sounds make: /k/ /a/ /t/; What word is this: ‘f-ish’</td>
</tr>
<tr>
<td>Segmenting</td>
<td>Tell me the sounds in the word ‘bat’</td>
</tr>
<tr>
<td>Substitution</td>
<td>Say ‘seat’. Now change /s/ to /m/</td>
</tr>
</tbody>
</table>

DAPA-S

Another assessment, still in developmental stages, is the Dynamic Assessment of Phonological Awareness in Spanish (DAPA-S; Loreti, 2015). The DAPA-S differs from the previously described measures in a number of important ways. First, it is a dynamic assessment that allows for teaching in conjunction with assessing. Second, it is computerized to increase fidelity of test administration. Third, it does not require spoken responses from children. And, finally, it has very simple spoken instructions to decrease comprehension demands on the part of the child. The DAPA-S was shown to be both reliable and valid as indicated by strong internal consistency and significant correlation with other measures of phonological awareness and emergent reading. The DAPA-S was designed to address aforementioned issues regarding lack of Spanish assessments of phonological awareness.

The DAPA-S is administered through the use of an application called Paradigm Experiments (Perception Research Systems, 2007). Pilot data for the DAPA-S was collected
using an 11” Dell tablet computer. Printed nonwords were displayed in bold, 72-point Arial font on a white background. Auditory stimulus consisted of digital recordings of an adult, female Spanish-speaker who spoke accentless, standard Spanish. Nonwords were originally recorded with a MicroMic C420 headset microphone using the Roland 24 bit Digital Studio Workstation (VS-1824) and transferred to a Sony PCM-R300 high-density linear A/D, D/A converter, which was connected to a desktop computer that ran Windows 7. The software program Praat (Boersma & Weenink, 2013) was used to manipulate the sounds (Loreti, 2015).

The DAPA-S has a Pre-instructional unit as well as 4 subtests (first syllable, final syllable, onset, rime). Nonwords were used for each task to eliminate the possibility of words being recognized by sight versus truly being selected using phonological awareness skills. The nonwords used in the test were chosen by 3 fluent Spanish speakers. Each subtest used 6 nonword pairs in the word structure CVCV (consonant, vowel, consonant, vowel). This word structure was chosen because research shows that young Spanish-speakers rarely use monosyllabic words (Ignacio, Hualde, Olarrea, & O’Rourke, 2013) and that Spanish words tend to be multisyllabic (Ingram, Dubasik, Liceras, Fernández Fuentes, Saenz, & Leow, 2011). In order to avoid first syllable stress, which is typical in Spanish words ending in a vowel, all nonwords were recorded in carrier phrases, then extracted (Loreti, 2015).

The DAPA-S tasks were designed so that each nonword pair differs by only the target segment (i.e. first syllable, last syllable, onset, rime), depending upon the subtest. This makes the target segment the only criteria possible for a correct selection. For each testing trial, the participant was required to listen to audio stimulus and choose the correct, corresponding printed target from the nonword pair (Loreti, 2015). The nonword pairs can be seen in Table 2.
Table 2

*Nonword Pairs for DAPA-S Subtests*

<table>
<thead>
<tr>
<th>First Syllable</th>
<th>Final Syllable</th>
<th>Onset</th>
<th>Rime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lima/Kuma</td>
<td>Tika/Tilo</td>
<td>Mata/Sata</td>
<td>Kela/Kuso</td>
</tr>
<tr>
<td>Lito/Kuto</td>
<td>Kusa/Kupo</td>
<td>Mapa/Sapa</td>
<td>Bela/Buso</td>
</tr>
<tr>
<td>Lisa/Kusa</td>
<td>Kufa/Kumo</td>
<td>Malo/Salo</td>
<td>Mela/Nuso</td>
</tr>
<tr>
<td>Lipo/Kupo</td>
<td>Tiga/Tibo</td>
<td>Mito/Sito</td>
<td>Tela/Tuso</td>
</tr>
<tr>
<td>Lifo/Kufo</td>
<td>Kuna/Kufo</td>
<td>Mepa/Sepa</td>
<td>Mela/Muso</td>
</tr>
<tr>
<td>Lina/Kuna</td>
<td>Tila/Tiko</td>
<td>Mulo/Sulo</td>
<td>Pela/Puso</td>
</tr>
</tbody>
</table>

The DAPA-S contains three types of “blocks” each containing six trials. These trials are depicted in Figure 1 below. During Pre-instruction, the child is shown a printed nonword in the center of the screen and is instructed to choose the matching printed nonword on the upper-left or upper-right corner or the screen. This teaches the child to match the print. During the Test block, the child is presented with a black box in the center of the screen (placed there as a simulation of “covering” the printed nonword that was there previously). They should then choose the printed nonword from the left or right corner of the screen. Presentation of the Teach block is contingent upon the child’s success during the Test block; if the child meets criterion for the Test block, the computer does not present a teach block. However, if they do not meet criterion for the Test block, the assessment moves into a Teach block. During the Teach block, the child is shown a target nonword in the center of the screen and is instructed to choose the matching print from the left or right corner of the screen. This differs from the Test block only in that, instead of a black box, it presents the printed nonword target in the center of the screen. Presenting the printed nonword target in addition to the audio stimulus provides the child an opportunity to match the
printed nonword target to the correct printed nonword choice as well as learn the relationship between the printed and spoken nonword (Loreti, 2015).

After each trial in the DAPA-S, the child is presented with feedback. Upon correct selection of a target nonword, a green screen with a smiley face appears with accompanying auditory feedback of, “¡Muy Bien! (Very good!).” Upon incorrect selection of a distractor nonword, a red screen with a frowning face appears with accompanying auditory feedback of, “Uh-Oh (Uh-Oh)” (Loreti, 2015).

The DAPA-S Pre-instruction consists of 24 nonword trials. Each Test or Teach block in the DAPA-S consists of 6 nonword pair trials each. Each of the nonwords in a pair is presented in a quasi-random order across trials, 3 times each, with the constraint that the same nonword is
not presented in more than 2 consecutive trials. Each nonword pair is presented within either a single Test block (6 trials total) or a within a combination of three Test and Teach blocks (18 trials total), depending upon the child’s performance.

If the child does not successfully complete the Pre-instructional unit for a subtest, the subtest was concluded and the child was assigned a score of zero for that subtest. Figure 2 shows the path through the blocks if the Pre-instruction is completed successfully. The first block of the assessment is always a Test block. If the child meets the criterion of 5 out of 6 trials correct on this first Test block (block 1), they earn 3 points and the computer moves on to the Test block (block 1) for the next nonword pair. However, if the child does not get at least 5 out of 6 trials correct on the first Test block, the computer presents 2 additional blocks for that same nonword pair. The second block is always a Teach block. If the child meets criterion on the Teach block (block 2), then the next block (block 3) will be a Test block that was identical to the first Test block (block 1). In this way, performance is tested after teaching. If the child does not meet criterion of 5 out of 6 correct on the Teach block (block 2), then the next block (block 3) will be a repeat of the Teach block (block 2). If block 3 is a Test block, the child receives 2 points for meeting criterion and 1 point if they do not meet criterion. If block 3 is a Teach block, the child receives 1 point regardless of whether they meet criterion or not. Following these 3 blocks for a nonword pair, the computer moves on to the next nonword pair. The sum of the points for each nonword pair within each of the 4 subtests (first syllable, last syllable, onset, rime) is divided by 6 (the number of trials within that subtest). The range of possible scores for each subtest is 0 to 3 (Loreti, 2015).
The DAPA-S is automatically scored and the administrator is presented with a percentage at the end of the test. The scores are also exported to an Excel file, where the results of each trial may be seen with the child’s nonword selections. A participant with a score near 3 for a subtest did not require much teaching. A participant with a score of 2 for a subtest was able to learn from extra support provided within a Teach block. A participant with a score of 1 on a subtest only
met criterion on a Teach block, meaning that they were not able to meet criterion when support was removed (i.e. they were not able to apply learning from Teach block to Test block). A score close to 0 on a subtest indicates that the participant did not show evidence of visual matching during the Pre-instruction.

**Statement of Purpose**

The current study aims to build upon existing data regarding development of the DAPA-S by evaluating the validity of a shorter version of the DAPA-S. The DAPA-S Short Form was designed with the purpose of retaining all the test items of the full version but with an altered structure which allows for significantly shorter administration time. The DAPA-S Short Form contains both fewer trials and fewer subtests than the full version of the DAPA-S. Since the full DAPA-S demonstrated good reliability and validity and the short form version retained all the same nonword trials and provides the same diagnostic information to the clinician, it is worth investigating the reliability and validity of a test that has a maximum of 36 trials versus the 108 in the full version. This study will determine reliability and construct validity of the DAPA-S Short Form by examining its internal consistency and assessing the measure’s concurrent and convergent validities. The research questions addressed in this study are as follows:

1. Is the DAPA-S Short Form a reliable measure of phonological awareness?
2. Does performance on the DAPA-S Short Form correlate strongly with performance on other measures of phonological awareness?
3. Does performance on the DAPA-S Short Form correlate strongly with performance on other measures of emergent reading skills?
Chapter 2: Methods

Participant Demographics

Nine Spanish/English emergent bilingual children (6 males, 3 females) ages 3.17 years (38 months) to 7.50 years (90 months) from Latin American origin participated in this study. All participants were preschool and school-age children at Learn Tampa Bay, a nonprofit organization that aims to assist families by providing literacy support. Participants were recruited through Learn Tampa Bay administration with the aid of printed flyers that explained the study in English and Spanish (See Appendix D for recruitment flyers).

Parents of participants completed a Spanish language survey which asked questions about origin, amount of time a child spends speaking or hearing Spanish, age of first and second language acquisition, etc. The full survey is presented in Appendix C. The participants were English-language learners (learning English in addition to their native language that is spoken at home) with the exception of one participant whose family reported that they began to speak Spanish to him/her at the age of three. Per report, eight participants were born in the United States (the Tampa, Florida area) and one participant was born abroad in Mexico. Eight out of nine parents reported Spanish as the language spoken at home; one parent reported that the participant spoke both Spanish and English in the home. On average, participants spent 40-60% of their day speaking or hearing Spanish, primarily with their family members. On average, participants spent about 30-50% of their day speaking or hearing English, primarily at school with teachers and classmates. Participants lived at home with either both parents, both parents and extended family, or both parents and sibling(s). Participants spoke Spanish with everyone,
just parents not siblings, or just one parent. Participants spoke English with everyone, just one parent, just one sibling, or only at school. Eight participants’ family members began speaking Spanish to them from birth. One participant’s family members began speaking Spanish to him/her at 12 months old, and another participant’s family began speaking Spanish to him/her at 36 months old.

To be included in this study, participants demonstrated hearing and vision within functional limits, according to parent report, and intact motor capabilities to allow for responding to the computer via touch. Although six of nine participants received scores less than 4 on the PLS-5 Spanish Screening Test (Zimmerman, et al., 2011) indicating that their knowledge of Spanish may have been low, all participants spent at least 20-40% of their day speaking and hearing Spanish and success in following directions that were solely given in Spanish during testing for this study. Research was approved by the institutional review board of the University of South Florida and informed consent from the participants’ parents or legal guardians was obtained prior to testing of participants. The participants received stickers and Spanish-English bilingual children’s books for their involvement.

Measures

Participants were administered the DAPA-S Short Form, the Preschool Language Scales, Fifth Edition Spanish Screening Test (PLS-5 Spanish Screening Test; Zimmerman et al., 2011), subtests (Letter Name/Letter Sound, Elision, and RAN) from the Test of Phonological Sensitivity is Spanish (TOPSS; Brea et al., 2003), and the Letter-word identification subtest from the Woodcock-Munoz Language Survey – Revised (WMLS-R LWID; Woodcock et al., 2005).

DAPA-S Short Form. The DAPA-S Short Form is the focus of this study. Like the full version of the DAPA-S, it was designed to be an assessment of phonological awareness. It
requires less administration time than the full version but still aims to provide direction as to whether a child is able to perform independently, benefits from training, or needs additional support even after training. Since the full DAPA-S demonstrated good reliability and validity and the short form version retained all the same nonword trials and provides the same diagnostic information to the clinician, it is worth investigating the reliability and validity of a test that has 36 trials versus the 108 in the full version.

The DAPA-S Short Form is similar to the full version of the DAPA-S in that the administrator gives the same instructions, it contains the same nonword pairs which were visually represented in the same way (black 72-point Bold Arial font on a white background) and accompanied by the same auditory stimuli, it contains the same visual/audio feedback, scores carry the same interpretations, the computer presents an identical Pre-instructional unit, and the Test block is always presented first. Like the full DAPA-S, the short form was presented using the Paradigm Experiments application on an 11” Dell tablet. Like the full DAPA-S, the short form is automatically scored by the program, the administrator is presented with a percentage at the end of the test, and the scores are exported to an Excel file.

The DAPA-S Short Forms different from the full version of the DAPA-S in several ways. Differences are related to the subtests, the method of presentation of each nonword pair, scoring, the amount of trials, and passing criteria for subtests. The DAPA-S Short Form only includes the first syllable and last syllable subtests of the DAPA-S full version based on results from the pilot study of the DAPA-S. During the DAPA-S pilot study (Loreti, 2015), all subtests demonstrated significant correlation to the total score of the DAPA-S; however, the first-syllable subtest was not significantly related to the other subtests. The first-syllables subtest was selected to remain in the short form version because it was related to the total score but provided different information
than the other subtests. The last-syllable subtest demonstrated significant correlation to the total score of the DAPA-S, as well as significant correlation to the onset and rime subtests. Because the last-syllable subtest provided the similar information as the onset and rime subtests, it was selected to remain in the short form version and the onset and rime subtests were eliminated.

As mentioned, the full DAPA-S was set up to progress through all blocks for each of the 6 nonword pairs. For example, the computer would move through Block 1, Block 2, and Block 3 for “lima/kuma” before moving to “lito/kuto” and doing the same. The DAPA-S Short Form is set up to progress through all 12 nonword targets (each word in the 6 nonword pairs) for each block before moving to the next block. See Figure 3 for a hypothetical progression through 3 blocks. This effectively changed the maximum number of trials from 108 for the full DAPA-S to only 36 for the DAPA-S Short Form.

The passing criteria on the full version of the DAPA-S was 5 correct of 6 trials per nonword pair while the passing criteria on the DAPA-S Short Form is 10 correct of 12 nonword targets per subtest block. Calculation of scores differs in the DAPA-S Short Form due to difference in method of presentation of nonwords. In the DAPA-S Short Form, a score is assigned for each block based on whether or not the criteria of 10 out of 12 trials is met per block. If the child achieves at least 10 of 12 trials correct on the first Test block (block 1), he/she receives a score of 3 and the subtest terminates because the child did not need to be presented the teach block. However, if the child does not meet criteria on the Test block (block 1), the computer presents 2 additional blocks. The second block is always a Teach block. If the child meets criterion on the Teach block (block 2), then the next block (block 3) will be a Test block that was identical to the first Test block (block 1) so that performance can be tested after teaching. If the child does not meet criteria on the Teach block (block 2), then the next block
(block 3) will be a repeat of the Teach block (block 2). If block 3 is a Test block, the child receives 2 points for meeting criteria and 1 point if they do not meet criterion. If block 3 is a Teach block, the child receives 1 point regardless of whether they met criterion or not. Possible subtest scores range from 0 to 3. Possible total score (sum of subtest scores) ranges from 0 to 6.

**Figure 3.** Depiction of DAPA-S Short Form blocks and point system. Flowchart uses example nonword pairs from the first syllable subtest.

**PLS-5 Spanish Screening Test.** The Preschool Language Scales, Fifth Edition Spanish Screening Test (PLS-5 Spanish Screening Test; Zimmerman et al., 2011) was administered as a
means to screen for typical development in Spanish. The PLS-5 Spanish Screening Test was
designed to identify monolingual Spanish or bilingual Spanish-English-speaking children, from
birth through 7 years 11 months of age, that might need comprehensive assessment of speech
and/or language. This screening test has forms that correspond to chronological age, which
increase in difficulty as age increases. Participants were only tested using the Spanish prompts
within this screener. They were given the Language section of the screening test. Mean score on
the PLS-5 was 2.89. Three out of nine children passed the PLS-5 screener, with failing scores
indicating that knowledge of Spanish may be low. However, parents of all participants reported
at least 20-40% or more of participant’s day was spent speaking and hearing Spanish). The PLS-
5 Spanish Screening Test had 91-93% reliability for the language subtest for all age groups and
had .85 sensitivity for correctly identifying children who needed comprehensive assessment of
speech/language abilities.

**WMLS.** The Letter-word identification subtest from the Woodcock-Muñoz Language
Survey – Revised (Woodcock et al., 2005) was administered as a measure of emergent literacy.
Correlational analysis between this measure and the DAPA-S Short Form was done to examine
convergent validity. The Letter-word Identification measures letter and word identification skills.
The Letter-word identification subtest from the Woodcock-Munoz Language Survey – Revised
had internal consistency reliability coefficients ($r_{11}$) of .74 for age 3, .88 for age 4, .97 for age 5
and 6, and .98 for age 7.

**TOPSS.** Subtests from the Test of Phonological Sensitivity is Spanish (TOPSS; Brea et
al., 2003) were given as measure of phonological sensitivity. The TOPSS was developed for
children from Kindergarten to the second grade; however, it was the only attainable Spanish test
of phonological sensitivity that could be attained by this research team. This further demonstrates
the need for accessible Spanish assessments of phonological awareness. The Elision, Letter-name/Letter-sound, and Rapid Automatic Naming (RAN) subtests were given. Correlational analysis between the subtests of this measure and the DAPA-S Short Form was done to examine concurrent validity. The TOPSS is an unpublished measure of phonological awareness that was designed to emulate the Comprehensive Test of Phonological Processing – Second Edition (CTOPP-2; Wagner, Torgesen, Rashotte, Pearson, 2013), a commonly utilized measure of phonological awareness in English. The Elision subtest targets phonological awareness. It measures a child’s ability to isolate a target phoneme within a spoken word, delete the phoneme, and identify/speak the new word after the deletion. For example, the administrator instructs the child to repeat the word “noche” then say “noche” without saying “che”. The Letter-name/Letter-sound subtest was designed to target Spanish alphabet knowledge. It measures the child’s ability to correctly identify the name and sounds of a given alphabet letter in Spanish. The administrator points to 19 selected letters and instructs the child to name each letter and say the sound of each letter. Each item within this subtest is given a score from 0-4, making the maximum possible score a 152 [19 items x 2 targets (i.e. letter-name and letter-sound) x maximum score of 4 per item] and the minimum possible score a 0. A score of 4 represents a correct response in the target language without any cueing from the clinician. A score of 3 represents a correct response in the language that was not requested, then a correct response in the target language after a cue was provided. A score of 2 represents no response until being cued to respond, then a correct response. A score of 1 represents no response until cueing, then an incorrect response. A score of 0 represents no attempt at the task or a response of No sé (I don’t know). The RAN subtest targets phonological retrieval skills. It measures the time that it takes for a child to sequentially name an animal and what color it is (given a visual representation of various colors of animals).
The child is first screened for knowledge of colors that are included in this subtest before it is administered. A score was given per color and per animal name, giving each of the 24 items a maximum score of 2. The maximum total score for this subtest was 48 and the minimum total score for this subtest was 0. There was no time limit set for the completion of the task.

**Procedures**

Three female researchers fluent in both English and Spanish administered assessments. Testing was conducted at Learn Tampa Bay in a quiet area with limited to no distractions. The participant were all in a sitting position with a good view of assessment stimuli. All testing administration and interactions with the participants were conducted in Spanish. If a participant provided a response in Spanish, it was openly accepted. However, if a participant provided a response in English, they were immediately encourage to respond in Spanish instead. Data collection of all participants took place over the course of 5 days with assessment taking a total of approximately 40 minutes per participant. Participants received verbal praise, visual and audio feedback inherent within the DAPA-S Short Form, and tangible reinforcements in the form of stickers and bilingual Spanish/English children’s books for their participation.

Consent forms and Spanish language parental questionnaires were collected and reviewed by researchers prior to beginning of any assessment. The PLS-5 Spanish Screening Test (Zimmerman et al., 2011) was administered first to investigate Spanish proficiency. The Woodcock-Muñoz Language Survey – Revised (Woodcock et al., 2005) measure of emergent literacy and the Test of Phonological Sensitivity in Spanish (Brea et al., 2003) measure of phonological awareness were given next. The DAPA-S Short Form was administered last among the assessments. For the DAPA- S Short Form, the First Syllable subtest was administered before the Last Syllable subtest. The computer begins with administration of Pre-instruction, prior to
presenting assessment blocks for both subtests of the DAPA-S Short Form. As described, Pre-instruction contains 24 trials that probe/teach visual matching of print. After Pre-instruction and before the first item of the assessment blocks, the researcher provided the following directions in Spanish: “Vamos a ver algunas palabras y tienes que escoger la misma palabra que escuchas” (We’re going to see some words and you need to choose the same word that you hear”). Prompts such as, “Cual palabra (which word)” or “Esta palabra o esta palabra? (this word or this word?)” “Que piensas?” (what do you think?) while gesturing in a general way toward the tablet were provided to redirect or encourage participants to respond if necessary. No other verbal instructions were given during the DAPA-S Short Form assessment.
Chapter 3: Results

The individual data for each child is presented in Table 3 below. An explanation of what each mean value represents is displayed in Table 4. Following this, descriptive statistics of scores from assessment measures (DAPA-S Short Form, LWID subtest of the WMLS-R, and TOPSS) are presented in Table 5.
Table 3

*Individual Data for DAPA-S Short Form and Other Measures*

<table>
<thead>
<tr>
<th>Participant</th>
<th>First Syllable</th>
<th>Last Syllable</th>
<th>Total Score</th>
<th>WMLS-R: LWID</th>
<th>TOPSS: Elision</th>
<th>TOPSS: RAN</th>
<th>TOPSS: LN/LS</th>
<th>PLS-5 Spanish Screening Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max: 3</td>
<td>Max: 3</td>
<td>Max: 6</td>
<td>Max: 36</td>
<td>Max: 20</td>
<td>Max: 48</td>
<td>Max: 152</td>
<td>Pass (1) or Fail (0)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>1</td>
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<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>27</td>
<td>11</td>
<td>48</td>
<td>57</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>25</td>
<td>0</td>
<td>34</td>
<td>13</td>
<td>0</td>
</tr>
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<td>7</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>13</td>
<td>0</td>
<td>41</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>16</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note for Table 3, 4, and 5.* Maximum scores are presented below the assessment name; minimum scores were 0 for all assessments. **WMLS-R: LWID** = Letter and Word Identification subtest from the Woodcock-Muñoz Language Survey- Revised. **TOPSS: Elision, RAN, LN/LS** = Elision, Rapid Automatic Naming, and Letter Name and Letter Sound subtests from the Test of Phonological Sensitivity in Spanish. **PLS-5 Spanish Screening Test** = Preschool Language Scales 5th Edition – Spanish Screening Test.
### Table 4

*Explanation of Mean Values*

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Mean Value Representative of</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAPA-S subtests</td>
<td>Average number of points scored for each subtest</td>
</tr>
<tr>
<td>WMLS-R: LWID</td>
<td>Average of total items correct for the first 36 items</td>
</tr>
<tr>
<td>TOPSS: Elision</td>
<td>Average of total correct</td>
</tr>
<tr>
<td>TOPSS: RAN</td>
<td>Average of total correct</td>
</tr>
<tr>
<td>TOPSS: LN/LS</td>
<td>Average of total coded score</td>
</tr>
<tr>
<td>PLS-5 Spanish Screening Test</td>
<td>Average of pass/fail binary score</td>
</tr>
</tbody>
</table>

### Table 5

*Descriptive Statistics*

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Skew</th>
<th>95% Bootstrap Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAPA-S Short Form: First Syllable</td>
<td>1.11</td>
<td>1.45</td>
<td>0.00</td>
<td>0.70</td>
<td>-0.01 - 2.23</td>
</tr>
<tr>
<td>DAPA-S Short Form: Last Syllable</td>
<td>0.33</td>
<td>0.50</td>
<td>0.00</td>
<td>0.86</td>
<td>-0.05 0.72</td>
</tr>
<tr>
<td>WMLS: LWID</td>
<td>12.44</td>
<td>9.42</td>
<td>10.00</td>
<td>0.59</td>
<td>5.20 19.69</td>
</tr>
<tr>
<td>TOPSS: Elision</td>
<td>1.22</td>
<td>3.67</td>
<td>0.00</td>
<td>3.00</td>
<td>-1.60 4.04</td>
</tr>
<tr>
<td>TOPSS: RAN</td>
<td>16.33</td>
<td>19.56</td>
<td>8.00</td>
<td>0.74</td>
<td>1.30 31.37</td>
</tr>
<tr>
<td>TOPSS: LN/LS</td>
<td>18.44</td>
<td>18.67</td>
<td>13.00</td>
<td>1.03</td>
<td>4.10 32.79</td>
</tr>
<tr>
<td>PLS-5 Spanish Screening Test (Pass/Fail)</td>
<td>0.33</td>
<td>0.50</td>
<td>0.00</td>
<td>0.86</td>
<td>-0.05 0.72</td>
</tr>
</tbody>
</table>
**Concurrent Validity**

Concurrent validity is a parameter that represents the extent to which an assessment corresponds to an established measure of the same construct, i.e. it reveals whether this assessment is measuring phonological awareness as defined by the established measure’s ability to measure phonological awareness. Concurrent validity of the DAPA-S Short Form was investigated by calculating a Pearson correlation between each DAPA-S Short Form subtest score and the scores from the measures of phonological awareness from the TOPSS. Results are presented in Table 6 and Table 7. Significant correlation was not seen between either of the DAPA-S Short Form subtests and the Elision, RAN, and Letter Name/ Letter Sound subtests of the TOPSS. This indicates poor concurrent validity as measured.

**Table 6**

*Pearson Correlations Between DAPA-S Short Form First Syllable Subtest and Other Measures of Phonological Awareness*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>TOPSS: Elision</th>
<th>TOPSS: RAN</th>
<th>TOPSS: LN/LS</th>
</tr>
</thead>
<tbody>
<tr>
<td>( r )</td>
<td>.49</td>
<td>.36</td>
<td>.43</td>
</tr>
<tr>
<td>( p )</td>
<td>.18</td>
<td>.21</td>
<td>.25</td>
</tr>
</tbody>
</table>

*Note.* \( r \) = Pearson correlations. \( p \) = probability.

**Table 7**

*Pearson Correlations Between DAPA-S Short Form Last Syllable Subtest and Other Measures of Phonological Awareness*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>TOPSS: Elision</th>
<th>TOPSS: RAN</th>
<th>TOPSS: LN/LS</th>
</tr>
</thead>
<tbody>
<tr>
<td>( r )</td>
<td>-.25</td>
<td>-.04</td>
<td>-.17</td>
</tr>
<tr>
<td>( p )</td>
<td>.51</td>
<td>.91</td>
<td>.67</td>
</tr>
</tbody>
</table>

*Note.* \( r \) = Pearson correlations. \( p \) = probability.
Convergent Validity

Convergent validity is the parameter that represents the degree to which two measures that should be measuring the same construct are related, e.g. phonological awareness has been shown to be correlated with emergent literacy so if this assessment truly measures phonological awareness then it should also be correlated with scores from an assessment that measures emergent literacy. Convergent validity of the DAPA-S Short Form was investigated by calculating a Pearson correlation between each subtest score and the scores from the LWID subtest of the WMLS-R. Results are displayed in Table 8 and Table 9. Significant correlation was seen between the First Syllable subtest of the DAPA-S Short Form and the LWID subtest \( (r = .87, p < .01) \), indicating strong convergent validity for this subtest. Significant correlation was not seen between the Last Syllable subtest of the DAPA-S Short Form and the LWID subtest \( (r = .44, p = .91) \), indicating poor convergent validity for this subtest.

Table 8

<table>
<thead>
<tr>
<th>Statistic</th>
<th>WMLS-R: LWID</th>
</tr>
</thead>
<tbody>
<tr>
<td>( r )</td>
<td>.87</td>
</tr>
<tr>
<td>( p )</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>

*Note. \( r \) = Pearson correlations. \( p \) = probability.*

Table 9

<table>
<thead>
<tr>
<th>Statistic</th>
<th>WMLS-R: LWID</th>
</tr>
</thead>
<tbody>
<tr>
<td>( r )</td>
<td>.44</td>
</tr>
<tr>
<td>( p )</td>
<td>.91</td>
</tr>
</tbody>
</table>

*Note. \( r \) = Pearson correlations. \( p \) = probability.*
Reliability

Estimates of reliability represent the consistency within the assessment and, therefore, the reproducibility of the score. The reliability of items within the DAPA-S Short Form was evaluated by assessing internal consistency using Cronbach’s alpha (α). As a whole, items on the DAPA-S Short Form had excellent internal consistency; $\alpha = .99$ for the First Syllable subtest and $\alpha = .99$ for the Last Syllable subtest. The subtests, however, were not significantly correlated with one another, $r = -.06, p = .88$. 
Chapter 4: Discussion

Emergent Bilingual children (Spanish-speaking English Language-learners) are a growing population in the United States and require assessment tools that can aid in early/accurate identification and later interventional guidance for reading difficulties and disorders. This study represents a step in the development of an assessment that aims to fill that need - the Dynamic Assessment of Phonological Awareness in Spanish (DAPA-S) Short Form. This study also aims to build upon previous pilot work that established good reliability and validity for the full version of the assessment. The discussion will address study results related to reliability and validity of the DAPA-S Short Form, limitations and future directions, and educational and clinical utility of the DAPA-S Short Form.

The DAPA-S Short Form demonstrated excellent reliability as indicated by a high internal consistency, $\alpha = .99$, indicating that children tended to get the same items correct or incorrect across subtests. High internal consistency of the DAPA-S Short Form was hypothesized since the assessment is computerized and each nonword trial is administered in the exact same way throughout the assessment. The First Syllable and Last Syllable subtests were not significantly correlated, $r = -.06, p=.8$, however. This is likely due to the fact that there was very little variability across the scores from the DAPA-S Last Syllable subtest. In fact, the majority of children scored 0 on this assessment, and the few who scored higher only received a score of 1. This means that none of the children tested demonstrated awareness of last syllables. Given this, it would not be expected for the Last Syllable subtest to be correlated with the First Syllable subtest. Furthermore, this pattern of responding is expected given research that has
shown the first syllable is more salient in print identification of spoken words than the last syllable (Walley, Smith, & Jusczyk, 1986).

The DAPA-S Short Form did not demonstrate convergent validity as measured. To measure convergent validity, scores from the DAPA-S were compared with subtests from the Test of Phonological Sensitivity in Spanish (TOPSS), an unpublished measure also designed to assess phonological awareness. Pearson correlations ($r$) for the First Syllable subtest were .49, .36, and .43 for Elision, RAN, and Letter Name/Letter Sound subtests of the TOPSS, respectively. Pearson correlations ($r$) for the Last Syllable subtest were -.25, -.04, and -.17 for Elision, RAN, and Letter Name/Letter Sound subtests of the TOPSS, respectively. Poor correlations may be a result of lack of variability in scores due to poor overall performance on the TOPSS (means: Elision 6.1% correct, RAN 34% correct, LN/LS 0.6% correct) and therefore inability to see correlational trends between the two measures. The TOPSS is a paper assessment that involves lengthy and complex administrative directions and is traditional in that it does not involve a dynamic teaching component. On several occasions, participants verbally relayed confusion about verbal instructions given on the TOPSS. Only one child was able to achieve a score greater than 0 on the Elision subtest, five children were able to achieve scores greater than 0 on the RAN subtest, and only one child was able to achieve a score greater than 30% correct on the Letter Name/ Letter Sound Subtest. Poor performance on the TOPSS may have also been influenced by the fact that all participants received academic instruction (which focuses on explicit teaching of phonological awareness skills required for things such as knowledge of letter names and sounds) in English only, while they mainly speak Spanish in the home (which may contribute more to oral language skills in Spanish). As mentioned earlier, oral language skills were not exceptionally correlated with early reading skills (Durgunoglu et al., 1993; Moll &
Diaz, 1985). With the exception of one participant, all participants gave letter names and letter sounds in English (not the target language for scoring). Many participants verbally stated that they did not know the letters or letter sounds in Spanish (target language for scoring) and were unable to produce them after being given maximum prompting. The DAPA-S Short Form did not demonstrate good convergent validity when scores on the TOPSS were used for correlational analysis. However, this may indicate that participants generally perform better on phonological awareness tasks that involve simple administrative directions as well as a dynamic method of testing.

The DAPA-S Short Form First Syllable subtest demonstrated good concurrent validity, indicated by significant correlation ($r = .87$) between subtest scores and scores from the LWID subtest from the WMLS-R, a subtest designed to assess emergent reading. This indicates that these measures likely assess related constructs (i.e., phonological awareness and emergent reading). The Last Syllable subtest did not demonstrate concurrent validity in this way ($r = .44$) which, again, is likely due to the restricted variability of scores for the Last Syllable subtest. Because the WMLS-R is a published, validated, and norm-referenced assessment, if these associations were also shown within the context of a larger study, then it would provide further evidence to validity of the DAPA-S Short Form.

**Limitations and Future Directions**

This study had many limitations that were influenced by anticipated and unanticipated factors. Given the relatively small sample size (nine children), this study has limited external validity. That is, this study has limited ability to predict outcomes for the general population. It was difficult to attain participants which met the inclusionary criteria for percentage of Spanish used since children within the United States begin receiving academic instruction in English by
the start of preschool. The small sample size led to many participants being the same age versus a range of ages to control for effects of skewed chronological age on scores. The sample also lacked randomization since all participants came from the same country in Latin America, were recruited from the same organization, and currently resided in the same city. Future studies could aim to study a larger and more randomized sample size in order to make results more representative of a general population of emergent Spanish-English bilingual children.

The small sample size led to another limitation – limited variability in scores (for example, children attained either a maximum score or a minimum score on the First Syllable subtest of the DAPA-S). Limited variation in scores decreased the accuracy of correlational analysis. This could be corrected for in a future study by, again, studying a larger sample size.

A third limitation of this study was the availability of established measures of phonological awareness in Spanish. As mentioned, Spanish assessments of phonological awareness are scarce and expensive to purchase. For this reason, the TOPSS (Brea et al., 2003) was utilized to calculate concurrent validity of the DAPA-S Short Form. This measure, however, is not published, does not have established population-level norms, and does not contain explicit/objective instruction for scoring. The TOPSS was developed by using it to assess 319 children (from Kindergarten to grade 4) from various Spanish-speaking countries. It was developed for use with children in Kindergarten to the second grade. Based on significant correlations ($r = .19 – .33; p < .05$) between participant’s performance on the TOPSS and teachers’ ratings of Spanish proficiency, the TOPSS appeared to be valid. Low performance on the TOPSS during this study could likely be attributed to the fact that the TOPSS was designed for an older age range than the majority of the population in this study. In the future, this study could be improved by utilizing an age-appropriate, standardized, published assessment of
phonological awareness with objective instructions for scoring in order to establish concurrent validity.

**Educational and Clinical Utility**

The short form of the Dynamic Assessment of Phonological Awareness in Spanish could be an invaluable tool in identification of children who will have difficulty with reading in later years if it is developed further to achieve concurrent and convergent reliability for all subtests. It could also be utilized in order to probe for a child’s potential to learn when given instruction because of its dynamic nature which includes both testing and teaching blocks. Since it is computerized and readily available anywhere that the Paradigm Experiment software can be downloaded, it could be utilized in the educational setting as well as in clinical settings. Simple verbal instructions make this assessment easily administered to children who may not comprehend complex instructions. Nonspeech responses allow children with limited verbal expression to take the assessment without any modifications. Furthermore, automatic scoring decreases the need for extensive administrator training, while internal consistency is maintained.

**Conclusion**

Established Spanish assessments of phonological awareness are scarce. Furthermore, Spanish assessments of phonological awareness that do not require complex instructions and speech responses do not exist. This study was an extension of a prior study which established validity and reliability for a nonspeech dynamic Spanish assessment of phonological awareness, the DAPA-S. This study aimed to develop a short form of the DAPA-S, and employed some important differences in programming of the assessment. Results from this study indicated that the DAPA-S Short Form was a reliable test that did not demonstrate concurrent validity in this study. However, the First Syllable subtest demonstrated good convergent validity. Further
research studies that look to establish reliability, validity, and eventually, normative referenced scores for these types of assessments are critically important so that struggling readers can be identified earlier for provision of interventional or supplementary educational services.
References


Appendix A: IRB Approval

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC235 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

2/22/2018

Antonietta Mastrota,
Communication Sciences and Disorders
9481 highland oak dr apt 1209
Tampa, FL 33647

RE: Expedited Approval for Initial Review
IRB#: Pro00034081
Title: Validity of a Spanish, Non-speech Dynamic Assessment of Phonemic Awareness in Children from Spanish-speaking Backgrounds
Study Approval Period: 2/21/2018 to 2/21/2019

Dear Ms. Mastrota:

On 2/21/2018, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents contained within, including those outlined below.

Approved Item(s):
Protocol Document(s):
Protocol - DAPA-S

Consent/Assent Document(s)*:
Parental Permission Form - English.pdf
Parental Permission Form - Spanish.pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent documents are valid until the consent document is amended and approved.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review
category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Research Involving Children as Participants: 45 CFR 46, Subpart D

This research involving children as participants continues to be approved under 45 CFR 46.404: Research not involving greater than minimal risk.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

[Signature]

Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board
Appendix B: Parental Permission Forms

Parental Permission to Participate in Research Involving Minimal Risk
Information for parents to consider before allowing their child to take part in this research study
IRB Study #Pro00018134

Your child is invited to participate in a small research study called, “Validity of a Spanish Non-speech Computerized Assessment of Phonemic Awareness in Children from Spanish-speaking Backgrounds.” The people who are in charge of this research study are the Principal Investigators (PI), Kelsey Wyman Chin and Antonietta Mastrola, two graduate students in the Department of Communication Sciences and Disorders at the University of South Florida (USF) and the Faculty Advisor, Dr. Michael Barker, Assistant Professor in the Department of Communication Sciences and Disorders at USF. However, other research staff may be involved and can act on behalf of the person in charge. The Learn Tampa Bay program has given us permission to do this investigation.

Why is this research being done?

The purpose of this study is to develop a new test of phonemic awareness that can be used with a wide range of Spanish-speaking children and adults who are learning to read. Phonological awareness is the broad skill that includes identifying and manipulating units of speech sounds. Phonemic awareness is a part of phonological awareness and it involves being able to recognize and manipulate individual speech sounds in spoken words. Examples of phonological awareness tasks are rhyming and matching words based on beginning or end sounds. Phonemic awareness is important because it is related to learning to read. Children with stronger phonemic awareness skills have an easier time learning to read; children who have difficulty learning to read frequently have weak phonemic awareness skills. Therefore, good tests of phonemic awareness are important for strong reading instruction.

The new test is administered on a computer and only requires the test-taker to pick printed made up words on a touch screen. We have successfully used the new test with non-reading adults with disabilities. This study seeks to determine if our new way of measuring phonemic awareness also works for Spanish-speaking children who are learning English and have a wide range of language skills.

By volunteering, you are helping us learn more about ways to measure skills in young children that are important for learning to read. Teachers and other professionals will use this information to measure phonemic awareness in other children with a wide range of developmental backgrounds. We hope the results of this research will have positive impacts on the process of learning to read for many children, and help them to thrive in their language environments.

Why is your child being asked to take part?

We are asking your child to take part in this research study because he or she is learning two languages (Spanish and English) and is in the early stages of learning to read. We expect a total of 20 children to participate in this research study. We hope to measure your child’s phonemic awareness skills with our new assessment in order to see how the results compare to other well-established assessments.

What will happen during this study?

Testing sessions will occur at Learn Tampa Bay and will be kept short (approximately 30 minutes) to avoid tiring your child. The study will take 1-2 sessions to conduct the new assessment, along
with established assessments. Assessments will be conducted in a quiet space to reduce distractions. The Study Investigator will first administer our new assessment and will provide verbal prompts in Spanish. Following completion of the new assessment, the Study Investigator will administer the other assessments of phonological awareness and reading to your child. Descriptions of the assessments are below.

- A test of Letter-Sound knowledge: We will ask your child to make the sound that goes with each of the letters printed on a set of flashcards.
- Test of Phonological Sensitivity in Spanish (TOPSS): We will administer 3 subtests from the TOPSS: Letter Name and Letter-Sound Subtest, Elision, and Rapid Naming. In the Letter Name and Letter-Sound Subtest, we will ask your child the names of certain letters of the alphabet and the sounds that those letters make. In the Elision subtest, we will ask your child to say the word that is left when certain syllables or sounds are removed (for example, “Repeat the word noche. Now, say noche without saying che”). In the Rapid Naming subtest, we will show your child a series of animals of different colors and we will ask your child to name both the animal and color as fast as they can.
- The Woodcock-Muñoz Language Survey-Revised Spanish Form: We will administer the Letter and Word Identification subtest which will determine your child’s skill at identifying letters of the alphabet and words in Spanish.
- Preschool Language Scales Fifth Edition Spanish Screening Test: We will administer this screening measure to determine your child’s emerging developmental communication skills.

Your participation in the study is completely voluntary:

The decision to allow your child to participate in this research study is completely voluntary. You have the right to allow your child to participate in this study, or to withdraw at any time. There will be no penalty if you choose not to provide permission for your child to participate in the study, or if you decide to withdraw at any time during the study. The decision of whether or not to involve your child in the study or results of this investigation will in no way affect your child’s grades or eligibility for services offered to your child at Learn Tampa Bay. If you decide to allow your child to participate in the study, he or she will receive stickers and a book. If you decide to withdraw your child from the study, he or she will still receive stickers and a book. There are no costs to you in regards to this research study. You will receive no payment or other compensation for taking part in this study. There are no dangers or risks to participants in this research study.

What are the potential benefits to your child if you let him/her take part in this study?

The potential benefits to your child include:

- A comprehensive review of skills necessary for learning to read. With your permission, we may share these results with your child’s teacher. Then, the teacher and the school could use these results to make decisions about how best to educate your child.
- Stickers and a children’s book

Privacy and Confidentiality

There are federal rules which specify that the information we collect is protected. We will keep your child’s study records private and confidential. Data from each child will have a numerical code without specifying the name of your child. All data will be kept in the language lab, closed in the Department of Communicative Disorders and Sciences at the University of South Florida. Only authorized researchers, agents of the Department of Health and Human Services and the Institutional Review Board of USF may inspect the records from this research. The results can be
reported at professional meetings, published in professional journals or can be used to train students in Communicative Sciences and Disorders while maintaining the anonymity of your child. We will not publish anything that would let people know who your child is.

**You can get the answers to your questions, concerns, or complaints.**

If you have any questions, concerns or complaints about this study, call Dr. Michael Barker at 813-974-8760.

If you have questions about your child’s rights, general questions, complaints, or issues as a person taking part in this study, call the USF IRB at (813) 974-5638.

**Consent for My Child to Participate in this Research Study**

It is up to you to decide whether you want your child to take part in this study. If you want your child to take part, please read the statements below and sign the form if the statements are true.

**I freely give my consent to let my child take part in this study.** I understand that by signing this form I am agreeing to let my child take part in research. I have received a copy of this form to take with me.

<table>
<thead>
<tr>
<th>Signature of Parent of Child Taking Part in Study</th>
<th>Date</th>
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<table>
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<tr>
<th>Printed Name of Parent of Child Taking Part in Study</th>
<th>Phone Number</th>
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</table>
Formulario de Permiso para Participar en un Estudio con Riesgos Menores.
Información para los padres a tener en cuenta antes de permitir que su hijo participe en este estudio de investigación
IRB Estudio # Pro00018134

Su hijo/a está invitado a participar en una pequeña investigación escolar llamada “La validez de una evaluación computarizada de conciencia fonológica sin necesidad del habla para niños con diferentes perfiles del uso del lenguaje.” Esta investigación está dirigida por unas Investigadoras Principales (PI) Kelsey Wyman Chin y Antonietta Mastrota, dores estudiantes en el Departamento de Ciencias y Desordenes Comunicativos de la Universidad del Sur de la Florida (USF) y el Consejero de la facultad, Dr. Michael Barker, Profesor Asistente en el Departamento de Ciencias y Desordenes Comunicativos de la USF. Pero otros individuos pueden estar asociados y puede que actúen en su lugar. El programa de Learn Tampa Bay nos da permiso para hacer esta investigación.

¿Por qué se hace este estudio?

El propósito de este estudio es desarrollar un examen de conciencia fonológica que pueda ser entonces utilizado para evaluar una variedad de niños y adultos hispanohablantes que están aprendiendo a leer. La conciencia fonológica es una habilidad ancha que incluye identificar y manipular sonidos del lenguaje. La conciencia fonémica es una parte de conciencia fonológica y implica la habilidad de reconocer y manipular sonidos individuales del lenguaje en palabras dichas. Ejemplos de tareas que implican la conciencia fonológica son las rimas y tareas que requieren el emparejamiento de palabras basado en el sonido inicial de las palabras. La conciencia fonológica es importante ya que se relaciona al aprendizaje de la lectura. Los niños que demuestran habilidades avanzadas en conciencia fonológica tienden a aprender a leer más rápido que aquellos que no han desarrollado estas habilidades, independientemente del idioma que hablen ya sea español o inglés. Por lo tanto, exámenes apropiados de conciencia fonológica son importantes para el desarrollo de programas de instrucción de lectura.

El nuevo examen será administrado a través de una computadora y solo requiere que el individuo seleccione una palabra inventada en una pantalla. Hemos utilizado este nuevo examen con adultos con incapacidades de aprendizaje que son analfabetos. Este estudio tiene como propósito determinar si nuestro modo para medir la conciencia fonológica también funciona para niños de habla hispana que están aprendiendo inglés y los cuales tienen una variedad de habilidades de lenguaje.

Con su participación voluntaria, usted está ayudándonos a aprender más sobre la manera en la cual podemos evaluar estas habilidades de lectura temprana en los niños. Profesores y otros profesionales pueden utilizar esta prueba para evaluar las habilidades de conciencia fonológica en niños con previas experiencias de desarrollo diferentes. Esperamos los resultados de esta investigación impacte de manera positiva el proceso de aprendizaje de leer para muchos niños, y les ayuda a los niños para tener éxito en sus ambientes del lenguaje.

¿Por qué se le ha pedido a su hijo participar?

Hemos invitado a su hijo/a a participar porque él o ella está aprendiendo dos idiomas (español e inglés) y porque están en sus fases iniciales de aprendizaje de leer. Esperamos incluir 20 niños para participar en este estudio. Deseamos evaluar su conciencia fonémica con nuestro examen nuevo y por este medio determinar cómo los resultados se comparan con otras pruebas de leer que son ya establecidas.
¿Qué sucederá en este estudio?

Los exámenes ocurrirán a Learn Tampa Bay, y serán cortos en tiempo, durando aproximadamente 30 minutos para evitar que su hijo/a se canse. El estudio completo necesitará de 1-2 sesiones de exámenes para terminar la prueba nueva y las pruebas ya establecidas en total. Los exámenes serán hechos en un lugar silencioso para reducir cualquier distracción que pueda ocurrir. La Investigadora Principal va primero a administrar el examen nuevo y proveerá instrucciones verbales para ayudar a su hijo/a entender el examen. Después de que el nuevo examen termine, la misma asistente de investigación le dará a su hijo/a otras pruebas ya establecidas en la literatura para determinar su conciencia fonológica y sus habilidades de lectura. Las descripciones de estas están debajo.

- Un examen de conocimiento del sonido de las letras en español: se le pedirá a su hijo/a que diga el sonido que corresponde a cada letra impresa en unas tarjetas.

- Test of Phonological Sensitivity in Spanish (TOPSS): tres de los sub-tests serán administrados: Nombre y Sonido de la Letra – En este sub-examen, preguntamos a tu hijo los nombres de las letras y después los nombres de los sonidos de las letras. En el sub-examen de Elisión, se le pedirá a su hijo/a que diga la palabra que queda cuando se desaparecen ciertas sílabas o sonidos (por ejemplo, “Repite la palabra noche. Ahora, di noche, sin decir che.”) En el sub-examen de Nombramiento Automático y Rápido, se le enseñarán a su hijo/a una serie de animales de diferentes colores y se le pedirá que diga, ambos, los nombres de los animales y los colores lo más rápido que pueda.

- El Woodcock-Muñoz Language Survey- Revised Spanish Form: se le dará a su hijo/a el sub-test de Identificación de letras y palabras el cual determinará la habilidad de su hijo/a de identificar letras del abecedario y palabras en español.

- Preschool Language Scales Fifth Edition Spanish Screening Test: vamos a administrar esta medida de detección para determinar emergentes habilidades de comunicación en el desarrollo de su hijo.

Su participación en el estudio es completamente voluntaria:

La decisión de permitir que su hijo/a participe en esta investigación es completamente voluntaria. Usted tiene el derecho de permitir que su hijo/a participe en este estudio o de retirarlo/a en cualquier momento. No habrá ningún tipo de penalidad en caso de que usted decida no proveer el permiso para que su hijo/a participe en el estudio, o si usted decide retirarlo/a en cualquier momento durante el estudio. Su decisión de la participación de su hijo/a en el estudio, ni los resultados de esta investigación, afectarán de ninguna manera la elegibilidad de su hijo/a para los servicios ofrecidos a su hijo/a en Learn Tampa Bay. Si usted decide permitir que su hijo/a participe en el estudio, él o ella recibirán estampitas (stickers) y un libro. Si usted decide retirar a su hijo/a del estudio, él o ella todavía recibirá estampitas y un libro. No existe ningún costo a usted en relación de esta investigación. Usted no recibirá ningún pago u otra compensación por participar en este estudio. No existen ningunos peligros o riesgos para los participantes.

¿Cuáles son los Beneficios de esta Investigación

Los beneficios de esta investigación incluyen:

- Un examen comprensivo de habilidades necesarias para aprender a leer. Con su permiso podríamos compartir estos resultados con la profesora de su hijo/a. Entonces la profesora y la escuela podrían utilizar estos resultados para tomar decisiones sobre cómo mejor educar a su hijo.
- Estampitas (stickers) y un libro.
Confidencialidad de los Datos de su Hijo/a:

Existen reglas federales en la cual especifican que tenemos que proteger la información de los niños. Mantendremos todos los archivos del estudio en privado. Los datos de cada niño tendrán un código numérico sin especificar el nombre de su hijo/a. Todos los datos serán mantenidos en el laboratorio de idioma, cerrado en el Departamento de Ciencias y Desórdenes Comunicativos a USF. Solo los investigadores autorizados, agentes del Departamento de Salud y Servicios Humanos, y la Junta de Revisión Institucional de USF pueden inspeccionar los archivos de esta investigación. Los resultados pueden ser reportados en reuniones profesionales, publicados en revistas profesionales o se pueden usar para entrenar a estudiantes en Ciencias y Desórdenes Comunicativos, pero manteniendo el anonimato de su hijo/a. No publicaremos nada que la gente sepa quién es su hijo.

Puede recibir respuestas a sus preguntas, preocupaciones y quejas.

Si tiene preguntas, preocupaciones o quejas sobre el estudio por favor llame al Dr. Michael Barker al 813-974-8760 o a Antonietta Mastrota al 727-743-4129.

Si tiene preguntas sobre los derechos de su hijo/a, preguntas generales, quejas, o cualquier otra situación que puede que sea general, pero está relacionada con su participación en el estudio, llame al Depto. de IRB USF al 813-974-5638.

Formulario de permiso para permitir que mi hijo/a participe en este estudio.

Depende de usted si desea que su hijo/a participe en este estudio. Si desea que su hijo participe en este estudio, por favor lea debajo y firme el formulario, solo si lo que lee es verdadero. **Ejercicio mi derecho y libremente le doy permiso a mi hijo/a para que participe en este estudio.** Entiendo que al firmar este formulario estoy permitiendo a mi hijo/a participar en este estudio. He recibido una copia de este formulario para llevarlo conmigo.

<table>
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<tr>
<th>Firma del padre del niño/a tomando parte en este estudio</th>
<th>Fecha</th>
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<tr>
<th>Nombre del padre del niño/a tomando parte en este estudio</th>
<th>Número de teléfono</th>
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Appendix C: Spanish Language Questionnaire

**Parental Questionnaire/Encuesta Parental**

**If you agree for your child to participate, then please fill out and return this questionnaire along with the consent form. Thank you.**

**Si usted está de acuerdo que su hijo participe, por favor complete y devuelva este cuestionario junto con el formulario de consentimiento. Gracias.**

1. Where was your child born? (city and country)  
¿Dónde nació su hijo/a? (ciudad y país)

2. Where were you and your spouse born? (city and country)  
¿Dónde nació usted y su esposo/a? (ciudad y país)

3. How long has your child been living in the United States?  
¿Hace cuánto tiempo ha vivido su hijo/a en los Estados Unidos?

4. Who lives at home with you and your child?  
¿Quién vive en casa con Usted y su hijo/a?

5. What languages do the family members at home speak to each other?  
¿Cuáles idiomas habla la familia con cada uno en casa?

6. How much of your child’s day is spent speaking or hearing Spanish? (Pick one)  
¿Qué cantidad del día su hijo/a se pasa hablando o escuchando español? (Elige uno)

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<td>40-60%</td>
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<tr>
<td>More than 80%</td>
<td>Más que 80%</td>
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7. With whom does your child speak Spanish?  
¿Con quién habla español su hijo/a?
8. How much of your child’s day is spent speaking or hearing English? (Pick one)
   ¿Qué cantidad del día su hijo/a se pasa hablando o escuchando inglés? (Elige uno)
   0-20%  20-40%
   40-60%  40-60%
   60-80%  60-80%
   More than 80%  Más que 80%

9. With whom does your child speak English?
   ¿Con quién habla inglés su hijo/a?

10. How old was your child when your family started speaking Spanish to him/her?
    ¿Cuántos años tenía su hijo/a cuando la familia empezó hablar español con él/ella?

Please mark any words that are a part of your daily use:
Por favor, marca cualesquiera palabras que son una parte de su uso diario:

___ popote  ___ túbano
___ pajita  ___ cigarro
___ manta  ___ celular
___ sabana  ___ móvil
___ lentes  ___ computadora
___ gafas  ___ ordenador
___ descarado  ___ zafacón

Please write a word to describe what you see in the picture:
Por favor, escribe una palabra para describir lo que ves en la imagen:
Appendix D: Recruitment Flyers

Research Study: Early Literacy for Bilingual Speakers

University of South Florida

What are we testing?
We are testing phonological awareness in Spanish.

Why is it important?
Phonological awareness is important for early reading. It helps children to sound out words.

Who is eligible to participate?
Spanish-speaking 4-6 year old children

What do we need from you?
One filled out consent form and one filled out parent questionnaire.

How much time will testing take?
30-60 minutes

What do you get from this experience?
Your child will receive a sticker and bilingual book for his/her participation.

IRB Number: Pro00034081
Name/Contact Information of the Principal Investigator: Antonietta Mastrota (727)743 4129
Estudio de Investigación: Alfabetización Emergente para Hablantes Bilingües

Universidad del Sur de la Florida

¿Qué estamos evaluando?
Estamos evaluando la conciencia fonológica en español.

¿Por qué es importante?
La conciencia fonológica es importante para el aprendizaje de la lectura. Es decir, la misma ayuda a los niños en el deletreo de palabras.

¿Quién es elegible para participar?
Hablantes de Español 4-6 años

¿Qué necesitamos de ustedes?
Un formulario de consentimiento completado y una encuesta llenada por ustedes.

¿Cuánto tiempo tomarán las evaluaciones?
30-60 minutos

¿Qué recibe de esta experiencia?
Su niño va a recibir una estampita y libro bilingüe por su participación.

Número de IRB: Pro00034081
Nombre/Información de contacto del Investigador Principal: Antonietta Mastrota (727)743 4129