

**PHONOLOGICAL PRODUCTIONS OF PUERTO RICAN SPANISH-SPEAKING
PRESCHOOLERS**

by

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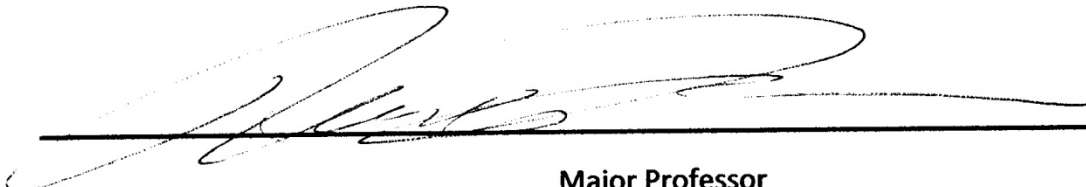
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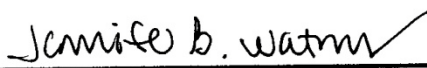
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Phonological Productions of Puerto Rican Spanish-Speaking Preschoolers

LITERATURE REVIEW

Children develop speech skills in different ways. There are many factors that impact development of these skills, which include home environment, hearing, genetics, health, and socio-economic status. Speech sound milestones, which are based on normative data available across age groups, help in the identification of speech sound disorders. Speech sound development, in many cases, may be different depending on a child's spoken language(s), cognitive ability, and chronological age. In order to assess whether a child's phonological acquisition is appropriate for their age, a Speech Language Pathologist (SLP) needs developmental norms for the language the child is learning. It also is important for an SLP to be familiar with the dialectal differences which can drastically affect assessment and placement decisions. Without the ability to differentiate between a communication difference due to second language acquisition and/or dialect difference and a communication disorder, SLPs may mis-diagnose children in the United States (US) as speech disordered. By doing so, SLPs may violate state and federal mandates (Kritikos, 2003). Needless to say, more research regarding dialectal differences and speech-sound disorders is still needed. Although more data are needed for all children, there is a particular need for additional data regarding dialectal differences of Spanish-speaking children.

According to the United States Census Bureau (USCB), racial and ethnic minorities made up about 80% of the nation's population in 2000, with 43% of the school-age population being Hispanic (USCB, 2000). According to the "24th Annual Report to Congress on the Implementation of Individuals with Disabilities Act" (IDEA

PL 101-476), the most prevalent disability among all preschoolers was speech and language impairment. It accounted for 55.2% of all preschoolers served from 2000-2001 and 56.3% of these children with impairments were Hispanic (U.S. Department of Education, 2002). According to ASHA, the number of communication disorders among Hispanic Americans is 3.4 million, with a projection of 9.7 million by 2025 (ASHA, 2004b). The number of English-speaking American children with phonological disorders is 7%. Although it is unknown how many Hispanic children present with the same disorders, if it is similar to the number of English-speaking American children, approximately 210,000 Latino children have phonological disorders (Perkins, 1997). According to statistics from the USCB in 2000, the two main Hispanic ethnicities in the United States are Mexican and Puerto Rican. Therefore, as the two most prominent Spanish dialects in the U.S., research needs to be gathered in order to equip SLPs with valid assessment and intervention.

Although much research has been completed examining phonological acquisition in young children, most of the reported data reflects information regarding monolingual English-speaking children in the preschool setting. Data regarding English and Spanish productions are needed when assessing bilingual (English-Spanish) speaking children. However, phonological acquisition data in typically developing monolingual Spanish and bilingual (Spanish-English) children are generally lacking. In addition, data regarding Spanish dialectal differences are needed.

English and Spanish Speech Sound Comparisons

Goldstein and Washington (2001) compiled data of various Spanish dialectal backgrounds. According to their research, monolingual Spanish-speakers develop

phonology in a similar manner to their monolingual English-speaking peers. Cotton and Sharp (1988) identify 18 consonant phonemes that typically appear in the Spanish language. These phonemes include: voiceless unaspirated stops, /p/, /t/, and /k/; voiced stops, /b/, /d/, and /g/; voiceless fricatives, /f/, /s/, and /x/; affricate, /tʃ/; glides, /w/, and /j/; lateral /l/; flap /r/ and trill /r/; and nasals, /m/, /n/, and /ɲ/. Furthermore, the voiced stops /b/, /d/, and /g/ are characteristically produced as the spirant allophones [β], [ð], and [ɣ] respectively. The monophthong vowels that occur in Spanish are: /i/, /e/, /u/, /o/, and /a/. These are produced similarly in English with respect to tongue height and placement, with the exception of the /a/ which is considered a low, central vowel in Spanish.

English-speaking children develop in much the same way as Spanish-speaking children. English and Spanish, however, have sounds that are specific to their language. For instance, in English, there are consonants such as [v], [θ], [ʔ], [ə], [æ], and [h] (Goldstein, 2000). Hodson (2007) developed phonological patterns with developmental milestones for children as they age. By comparing assessment results to these data, a clinician will be able to determine if the child is typically developing or not. The milestones show which phonological patterns the child should present with at each age. For example, by two years of age, English-speaking children are expected to use words to communicate, have all final consonants, and have syllable awareness. A year later, children are expected to have expanded their phonemic repertoire, be able to produce /s/ clusters, and distinguish between anterior and posterior sounds. By four years of age, children are expected to suppress most omissions and “simplifications”, and exhibit adult-like speech. By 5 and 6 years, children should have liquids /l/ (by 5 years) and /r/

(by 6 years). At this time, their phonemic repertoire should be stabilized as well. By age 7, children will perfect sibilants and ‘th’ and exhibit speech similar to an adult.

Spanish Dialectal Differences

For many years, speech-language pathologists have been presented with clientele with various dialects. A dialect of a language (also referred to as a communication difference) is defined by ASHA (1993) as “a variation of a symbol system used by a group of individuals that reflects and is determined by shared regional, social, or cultural/ethnic factors”. Over 300 million people speak some form of Spanish, with over 31 million residing in the United States. Contained within the Spanish language are three rather dissimilar dialects that are predominant in the U.S. These dialects consist of Mexican or Mexican-American, Cuban, and Puerto Rican (Iglesias & Anderson, 1993). The Cuban and Puerto Rican dialects sometimes are combined and labeled as the “Caribbean” dialect. A fair amount of data exists on the Mexican/Mexican-American dialect, and research efforts have been started on the Puerto Rican dialect as well. Some research has also been devoted to Bolivian Spanish (Fantini, 1985) and Dominican Spanish (De la Fuente, 1985). Although all of the Latin American Spanish dialects are derived from Castilian Spanish, they differ in areas of phonology from each other and the Castilian Spanish from Spain (Encyclopædia Britannica, 2009). Whereas in English, dialectal differences typically affect vowels, in Spanish, the differences are primarily on consonants. Speech-language pathologists have been encouraged to take dialect into consideration when scoring assessments, no matter the language. Knowledge of different dialects is necessary so as to avoid counting dialect features as phonological errors when assessing a child. This could lead to wrongfully diagnosing the child as phonologically

disordered, diagnosing the child as more severe than they actually are, or even causing them to unnecessarily and wrongfully receive therapy on a feature of their dialect (Goldstein & Iglesias, 2001). It is necessary to remember that not every speaker will make use of every dialectical feature. Likewise, every feature will not be exhibited by all speakers of the dialect.

Mexican Dialect. Phonological Norms of Mexican-American children have been conducted by some individuals (e.g., Prezas, 2008). In order to assess the Spanish phonological skills of children, the Assessment of Phonological Patterns in Spanish- 2nd Edition (APPS-2) (Hodson & Prezas, 2008) was used to represent phonological strengths and weaknesses of 60 Spanish-speaking 4- and 5-year-old children. Prezas found that the Mexican-American children most frequently presented with the following deviations: liquids, consonant clusters, glides, and stridents. Other researchers have found that certain populations (subgroups) who speak the Mexican dialect omit the /k/ and /g/ adjacent to consonants. Substitutions have been shown to occur with /h/ for /s/ and /x/ in the final position, and /j/ for /x/ in the initial position for some subgroups of the Mexican dialect. The Mexican dialect also uses the phone /v/ in place of /b/ (Canfield, 1981; Cotton & Sharp, 1988; Lombardi & de Peters, 1981; Navaro-Tomas, 1966). Collectively, researchers have found that most phonemes remain intact in the Mexican dialect of Spanish, with only a few substitutions noted.

Chilean Dialect. Sullenbarger (2010) examined Spanish phonological norms of Chilean 3-, 4-, and 5-year-old children. In this study, the investigator also used the APPS-2 to compare Chilean data with data from Mexican-American children gathered by Prezas (2008). Sullenbarger found similar TOMPD scores in the Chilean and Mexican children

when divided by age. The TOMPD the total score of the exam derived from the sum of all the phonemes and processes in error within the assessment. The Chilean children demonstrated a 22.6% error rate on final consonant deletion, 15.1% error rate on consonant cluster reduction, 13% error rate on liquid deviations, and 11.1% error rate on stridency deviations. The TOMPD scores of the Chilean children averaged at 17.9. Overall, the Chilean children tended to delete final consonants, reduce consonant clusters, and use liquids and stridents interchangeably.

Puerto Rican Dialect. From features found to be specific to dialects of Mexican/Mexican-American Spanish and Puerto Rican Spanish, differences have been noted between the two dialects; affecting both specific phonemes and consonant sound classes (Goldstein & Iglesias, 1996). Goldstein and Iglesias (1996) found common features of the Puerto Rican dialect to be the following: substitution of /l/ for /r/ in coda position, replacement of the trill /r/ of standard Spanish with the velar fricative /x/ or uvular liquid /R/, deletion of the interdental fricative /ð/, aspiration of the /s/ sound, as well as deletion of the /s/ sound in syllable-final position. Furthermore, the children were found to delete the phoneme /x/ in 80% of the possible cases. These data differentiate the Puerto Rican dialect from the Mexican dialect. For example, the Mexican dialect uses specific sound substitutions, whereas the Puerto Rican dialect is particularly associated with sound deletions.

Phonological Productions of Puerto Rican Spanish-Speaking Children

According to research by Goldstein and Iglesias in 1998, Spanish-speaking children acquire most sounds by the age of five, excluding mastery of /x/ “j,” /s/ “s,” /tʃ/ “ch,” /l/ “l,” /r/ “r,” /r/ “rr,” and consonant clusters. Furthermore, typically developing

children no longer produce major phonological deviations by the time they reach 3.5 years of age. Phonological deviations that often occur before this age are cluster reduction, liquid simplification, and stopping. Patterns typically occur in both normally developing children and children with phonological disorders. Other patterns that occur in this group of children, but much less frequently, are palatal fronting, assimilation, and final consonant deletion. In Spanish-speaking children with phonological disorders, some less commonly occurring phonological processes include initial consonant deletion, weak syllable deletion, and velar fronting. Goldstein and Iglesias offer 4 principles for assessing phonological skills of Spanish-speaking children: “(1) use an assessment tool designed specifically to assess Spanish-speaking children; (2) take the child’s dialect into account; (3) determine if the child’s use of speech sounds is sufficiently different from normal development to warrant intervention; (4) determine treatment direction” (1998, p.1). They also discussed treatment options for phonological disorders in these bilingual speakers.

In 1996, Goldstein and Iglesias studied the phonological patterns of 3- and 4-year old American children of Puerto Rican descent. They purported that the lack of knowledge about this dialect can greatly impact a child’s diagnosis. Thus, Goldstein and Iglesias (1996) used the Assessment of Phonological Disabilities (APD) (Iglesias, 1978) to assess fifty-four Spanish-speaking children ranging in age from 3:2 to 4:11 (24 3-year-olds and 30 4-year-olds). All the children were from a Head Start center in Philadelphia, Pennsylvania and were of Puerto Rican descent. All of the children were considered to have normal speech and language development and normal hearing. The following nine processes were targeted: cluster reduction, final consonant deletion, liquid simplification,

weak syllable deletion, assimilation, velar fronting, stopping, palatal fronting, and initial consonant deletion. The data gathered from the children were first analyzed without taking dialect into account and again, taking dialect into account. From the results, patterns specific to each age group were revealed. From the 24 3-year-olds, 178 errors were recorded, with 150 of them falling under one of the nine targeted processes. There were 235 errors across the 30 4-year-olds, of which 216 fell under the nine targeted processes. From data analysis, they concluded that cluster reduction and liquid simplification were the two most prevalent phonological processes. Although they wished to further characterize phonological norms for Puerto Rican children, the results did not show a high frequency (greater than 10%) of any of the nine processes assessed. However, the investigators reported that the results may have been affected by dialectical features of Puerto Rican Spanish such as weakening or deletion of final consonants that do not allow for phonological process such as final consonant deletion to occur. Furthermore, their results showed that phonological processes along with syllabic and substitution processes occurred more frequently in the speech-delayed children.

In order to determine if taking dialect into account is a necessity for assessing phonological processes, Goldstein and Iglesias (November, 1991) used the Assessment of Phonological Disabilities (APD; Iglesias, 1978) to assess Spanish-speaking children ages 3 and 4 years. They examined simple CVCV forms, clusters, and multi-syllabic words. Of these children of Puerto Rican descent, 39 were typically developing and 10 were speech-delayed (5 female and 5 male). These children were enrolled in a Head Start program in Philadelphia, Pennsylvania. The children's ages ranged from 3;0 to 4;11. The investigators identified the targeted phonological processes that were present in the

children's speech. By comparing data to a standard Spanish referent and then a Puerto Rican referent of phonological processes, Goldstein and Iglesias were able to determine that taking dialect into account does in fact alter the results. This was true for all syllabic processes in the typically developing children and for a majority of the phonological processes in the speech-delayed children. Considering dialect altered the results for the non-disordered children the most with final consonant deletion and liquid simplification.

Goldstein and Iglesias (November, 1991) also found other dialectical features specific to Puerto Rican Spanish based on the data gathered from the normally developing Spanish-speaking children. Their results showed that final consonant deletion is present greater than 10% of the time in all subjects when compared to the standard referent, and only present in the 3;0-3;5 and 3;6-3;11 age groups when compared against the Puerto Rican referent. They also found that cluster reduction occurred in the 3;0-3;5 and 4;0-4;5 age groups when using the standard referent as a comparison, and only in the 3;0-3;5 group when using the Puerto Rican referent. Weak syllable deletion was found to occur in neither group no matter the referent used as a comparison. The only substitution process, liquid simplification, was present in all the age groups when using the standard referent and none of the age groups when using the Puerto Rican referent. Velar fronting, stopping, palatal fronting, and assimilation were not found to occur in any age group using either of the referents. Thus, their results showed that dialect should be taken into account when assessing Spanish-speaking children. Furthermore, they believed that most phonological processes are suppressed in typically-developing Spanish-speaking children by age three and a half.

For the speech-delayed children, Goldstein and Iglesias (November, 1991) found that initial consonant deletion, liquid simplification, stopping, and final consonant deletion were present when compared against the standard referent, and when compared against the Puerto Rican referent, all four processes except final consonant deletion were present. Furthermore, they found that the 3-year-olds use syllabic processes more than substitution processes, whereas the opposite was found in the 4-year-old group. When using the Puerto Rican referent, they found that boys present more often with initial consonant deletion, weak syllable deletion, and liquid simplification, while the girls more often presented with cluster reduction, stopping, and liquid simplification. Using the same referent, the boys also exhibited more syllabic processes than substitution processes, while the opposite was true for the girls. As was hypothesized and in comparison to typically developing speakers, the children who were speech-delayed presented with more processes (with more frequency) across all age groups and both genders.

Another study completed by Goldstein and Iglesias (November, 2001) further examined the effect of dialect on phonological patterns. Goldstein and Iglesias studied one-hundred-eight 3- and 4-year-old Spanish-speaking children from a Head Start program in Philadelphia, Pennsylvania. All of the children were of Puerto Rican descent. The APD was used to assess the children's phonology. The results of their study showed that dialect had an effect on consonant errors, errors within sounds classes, and occurrences of phonological processes within a language.

Based out of Puerto Rico, Stepanof (1990) studied phonological patterns in 20 3- and 4-year-old Puerto Rican children. Stepanof used a previous version of the APPS-2 in

this study to report the phonological skills of participants. The investigator reported that liquid deficiencies, stridency deletion, and postvocalic singleton omission were the most commonly occurring phonological deviations (39% rate of occurrence). Stridency deletion occurred 43% of the possible occurrences for participants in the study.

Similar studies exist on phonological acquisition in Spanish-speaking children, only these studies compared monolingual and bilingual (Spanish-English) children. Gildersleeve, Davis, and Stubble (1996) studied the phonological skills of Spanish, English, and bilingual (Spanish-English) children. They found patterns of cluster reduction, stopping, and gliding in the 3-year-old monolingual Spanish group. They also found that the bilingual children had the highest or second highest percentage of occurrence of all phonological patterns (consonant deletions, cluster reductions, final consonant deletions, stopping, and gliding). In another study by Gildersleeve, Neumann, and Davis (1998), the phonological skills of monolingual versus bilingual typically developing children was again looked at. They concluded that the bilingual children presented differently and with more phonological errors than their monolingual peers. Finally, Goldstein and Washington (2001) analyzed the phonology of 12 typically developing 4-year-olds who were bilingual (Spanish-English). They took dialect features into account following Goldstein and Iglesias (1996), thus protecting from scoring the features of the dialect as errors. They found cluster reduction to occur 8.3% of the time and liquid simplifications nearly 17% of the time. All of these studies either directly assessed phonology in bilingual (Spanish-English) speakers or compared monolingual children to bilingual children.

SUMMARY/PURPOSE OF STUDY

The purpose of this research is to expand previous research regarding the phonological productions of Spanish-speaking children of Puerto Rican descent. Some researchers have found that monolingual Spanish-speakers develop phonology (e.g., acquisition of shared phonemes) in a similar manner to their monolingual English counterparts (Goldstein & Washington, 2001). Due to the limited research on the different dialects of Spanish, SLPs encounter a challenge when trying to assess whether children are acquiring sounds in a manner appropriate for their dialect. As the other dialect that is the most prevalent in the U.S., the Puerto Rican dialect has a great need for more normative data on phonological productions for many reasons. First, the research that does exist is limited to participants who are 3 and 4 years of age. There are no available studies where researchers have investigated the phonological patterns of Puerto Rican 3-, 4-, and 5-year-olds. Data from 5-year-old children is needed, due to the fact that many children in the schools who require services are 5 years of age. A paucity of data exists comparing the phonological productions of more than two age groups. Second, it is less effective to compare the phonological productions of Spanish dialects (e.g., Puerto Rican, Mexican) when different assessments tools are being used to compare results; which previous investigators have done (Goldstein & Washington, 2001). Therefore, it would be advantageous to have phonological data from various dialectal backgrounds where investigators have used the same assessment tool to compare phonological patterns. Moreover, comparing phonological patterns of children of Puerto Rican decent with other children of different dialects (e.g., Mexican) on the same measure may help SLPs and other professionals better understand dialectal differences. Therefore, the

purpose of this study was to examine the phonological patterns of pre-school children from the Puerto Rican dialect of Spanish. The following questions were addressed:

1. What are the Spanish phonological patterns (speech productions/deviations) of typically developing 3-, 4-, and 5-year-old monolingual children of Puerto Rican descent?
2. Are there group differences in the phonological skills of children based on age?
3. How do the phonological patterns of Puerto Rican children compare with previous investigations of children from Puerto Rico and other dialects (i.e., Mexican, Chilean)?

METHODOLOGY

Participants

Directors of the program from the Universidad del Turabo (UT), Puerto Rico were notified of the purpose of the study and permission from the testing facility was secured (see Appendix A). Caregiver letters were sent to parents of perspective children in both English and Spanish (see Appendix B) informing them of the present study, its purposes for research, and how the results will be used. The caregivers signed this letter to give consent for their child to participate in the study (see Appendix C). HIPPA forms also were completed and returned by caregivers (see Appendix D). Caregiver questionnaires addressing developmental milestones of speech, language, and development (see Appendix F) were sent home and returned. No child participated in the study if prior speech-language services were received.

After reviewing candidates for the study, twenty-seven typically developing children of Puerto Rican descent were identified as participants. Ages ranged from 3;0 (years;months) to 6;1, with a mean age of 4;4. For group comparisons, participants were divided into three groups (i.e., 11, 3-year-olds; 9, 4-year-olds; 7, 5-year-olds). There were a total of 15 boys and 12 girls. The children came from three educational centers in the San Juan area of Puerto Rico with the assistance of faculty and staff from the UT. In order to participate in the study, the following criteria were met by each child: (a) no prior speech-language services; (b) passed a bilateral hearing screening at 500, 1000, 2000, and 4000 Hz at 25 dB; (c) no developmental delays in relationship to the speech and hearing mechanisms (based on parent and teacher report); and (d) Spanish was the primary language spoken in the home (determined by a caregiver questionnaire).

Before working with any child, the clinicians acquired the child's consent to participate (see Appendix E). Participants were tested individually in a quiet room at the

attending school/center. All data was collected, measured, and assessed by a bilingual graduate student from Texas Christian University (TCU), accompanied by a licensed professional and a graduate student from UT, who were native Spanish speakers of the Puerto Rican dialect. The Receptive One-Word Picture Vocabulary Test-Spanish Bilingual Edition (Brownell, 2001), was used to screen each child's receptive language. All children scored within normal limits on this assessment. Using the criteria aforementioned, hearing screenings were completed by a graduate student from UT and a SLP faculty member from their program. All children passed their hearing screenings.

Procedures

Administration. The children were administered the Assessment of Phonological Patterns in Spanish- 2nd Edition (APPS-2) (Hodson & Prezas, 2010). The APPS-2 is an assessment tool that measures children's phonological patterns using 44 manipulatives. The clinician asked the child "que es esto?" (i.e., "What is this?") to elicit a response. If the child was unaware of the correct response or did not respond, models and delayed imitation were used. The APPS-2 has been primarily normed on Mexican-American children and targets have been chosen according to what is most stimulative for those children. Thus there was the possibility that some delayed imitation would be necessary during administration due to semantic variations in the Puerto Rican dialect (e.g. calling a school a house). This was acceptable, because researchers have not found any significant differences between spontaneous or delayed responses in the past (Goldstein, Fabiano, & Iglesias, 2004). All responses from the children were transcribed at the time of the testing by a bilingual graduate clinician from TCU and a bilingual graduate clinician from UT. The testing was recorded on a digital recorder for further analysis and to use for later reliability. Results of the tests were evaluated using scoring criteria from the APPS-2. The following phonological patterns were evaluated: (1) omissions including omission of

syllables, omission of initial consonant clusters, omission of medial consonant clusters, omission of initial consonants, omission of medial consonants, omission of final consonants, and deficiencies including nasals, glides, liquids (e.g. /l/ and /r/), stridents, velars, and anterior nonstridents (backing of alveolars). The APPS-2 was selected for a variety of reasons. First, the APPS-2 uses manipulatives in place of pictures. The use of objects over pictures has been shown to elicit more spontaneous productions in Spanish-speaking children (Prezas, 2007) and children have been found to enjoy the use of objects over pictures (Hodson, 2007). Furthermore, unlike similar tests in Spanish, the APPS-2 was designed to assess consonant sequences which are prevalent in the Spanish language. Finally, the APPS-2 has been found to be highly correlated with the HAPP-3 (Hodson, 2004; Prezas, 2008), the English counterpart to the assessment. Both assessments can be used in a paired fashion to assess bilingual Spanish-English children in the United States of America.

Scoring. Scoring of the APPS-2 was done according to the test guidelines. Puerto Rican participants were scored using the same criteria as other dialects of Spanish (e.g., no variations were made for dialects). For each child, a TOMPD was calculated from the APPS-2 scores using the APPS-2 Analysis Sheet. Percentages of each category also were calculated and reported for participants using the APPS-2 Summary Sheet. These values were later used for analysis.

Reliability. Each child's speech productions were transcribed live by two examiners at the time of testing and recorded on a PMD 620 digital recorder for future transcription. Four TCU graduate students and four UT graduate students participated in the live transcriptions. Each TCU student was paired with a UT student for the duration of the testing. Following completion of the testing, the two transcripts for each participant

were compared. Independent live transcriptions of the APPS-2 were analyzed using a point-by-point agreement index.

$$\text{Point-by-point agreement index} = \frac{A}{A + D} \times 100 = \text{percentage of agreement}$$

Where (A) represents the number of points the two graduate students agreed upon based on their live transcriptions and (D) represents the number of points on which they disagreed. The inter-rater percentage of agreement for live transcriptions was 90% for all participants.

Intra-rater reliability was established as well. Two TCU graduate students (25% of the transcribers) re-listened to 20% of the recordings. The recordings were randomly selected and samples were independently re-transcribed. Intra-rater reliability also was calculated using a point-by-point agreement where (A) represents the total number of possible consonants (149) and (B) represents the number of discrepancies based on the graduate students' second transcription (a re-listening and re-transcribing of the entire assessment). The intra-rater reliability was 99.55% and 98.65% respectively for both TCU graduate students.

After inter- and intra-rater reliability were established, the primary investigator served as a third listener and re-listened to all discrepancies (i.e., phonetic sound differences identified during transcription) found by live and intra-rater analyses. The primary investigator used this method (i.e., two-out-of-three) to determine accuracy of speech-sound productions. This provided a level of consensus for transcription.

Data Analysis. Data files were extracted using a Marantz PMD 670 digital recorder, uploaded to a Dell Inspiron notebook, and converted to MP3 files. Data were analyzed SPSS software. Descriptive statistics (e.g. frequency, mean, standard deviation) were used to describe the phonological patterns of the participants in Spanish (research question 1). Data for participants were divided into the pre-determined age groups (i.e., 3-, 4-, and 5-year-olds). Categories of phonological patterns were evaluated for frequently occurring patterns between age groups (research question 2). (i.e. dividing them into three, four, and five-year-old groups). In order to determine whether there were group differences in the phonological skills of children based on age (research question 3), a One Way Analysis Of Variance was calculated for TOMPD by Age. Moreover, information from Sullenbarger (2010), Prezas (2008), Goldstein and Iglesias (1996), and Stepanof (1990) was used to determine category descriptions (research question 3).

RESULTS

The purpose of this investigation was to report phonological norms for native Puerto Rican children 3-, 4-, and 5-years of age. Specific phonological patterns (i.e., speech productions and deviations) were calculated for the 3- to 5-year-old children. Furthermore, age comparisons were made to determine whether phonological skills based on age were significantly different.

Phonological Patterns. In order to address which phonological patterns are typical of the three age groups of monolingual Puerto Rican children examined, the TOMPD scores of the 3-, 4-, and 5-year-old children were calculated (see Table 1). Additional information regarding phonological deviation categories and results by age also was calculated (see Tables 2 and 3). Little variability between the average TOMPD scores of the three groups was noted (see Table 1).

Table 1: Average TOMPD of 3-, 4-, and 5-year-old Puerto Rican Children

Age Groups	Spanish TOMPD (SD)
3-year-olds	24.1 (12.9)
4-year-olds	24.2 (20.9)
5-year-olds	18.7 (11.8)
All Children	22.7 (15.4)

Table 2: Percentages of Phonological Deviations of 3-, 4-, and 5-year-old Puerto Rican Children

	3-year old	4-year-old	5-year-old
Phonological Deviation	Percentage (SD)	Percentage (SD)	Percentage (SD)
Omissions			
Syllables	0.8 (1.6)	1.8 (4.6)	0.6 (1.0)
Consonant Clusters/Sequences	5.8 (5.7)	6.3 (14.7)	5.0 (7.9)
<i>Consonant Singletons</i>			
Prevocalic	2.2 (3.7)	3.1 (9.3)	0.0 (0.0)
Intervocalic	1.6 (4.2)	1.3 (1.6)	1.3 (1.6)
Postvocalic	9.8 (12.4)	15.8 (18.3)	5.9 (6.3)
Consonant Category			
Deficiencies			
<i>Sonorants</i>			
Liquids	10.55 (13.8)	8.0 (14.7)	8.0 (17.3)
Nasals	2.6 (5.3)	3.1 (7.4)	0.9 (2.3)
Glides	6.1 (6.9)	7.6 (9.8)	1.0 (2.6)
<i>Obstruents</i>			
Stridents	45.4 (15.4)	45.3 (11.2)	42.9 (10.4)
Velars	5.2 (5.9)	2.6 (5.8)	0.9 (2.3)
Other (Anterior	6.1 (2.8)	5.2 (3.6)	4.6 (2.7)

Nonstridents/ Backing)			
TOMPD	24.1 (12.9)	24.2 (20.9)	18.7 (11.8)

Table 3: Percentages of Phonological Deviations of 3- to 5-year-old Puerto Rican

Children

	3-, 4-, and 5-year-old
Phonological Deviation	Percentage (SD)
Omissions	
Syllables	1.1 (2.8)
Consonant	5.8 (9.7)
Clusters/Sequences	
<i>Consonant Singletons</i>	
Prevocalic	1.9 (5.8)
Intervocalic	1.4 (2.9)
Postvocalic	10.8 (13.7)
Consonant Category	
Deficiencies	
<i>Sonorants</i>	
Liquids	9.0 (14.5)
Nasals	2.3 (5.4)
Glides	5.2 (7.5)

<i>Obstruents</i>	
Stridents	44.7 (12.5)
Velars	3.2 (5.3)
Other (Anterior Nonstridents/ Backing)	5.4 (3.0)

The percentages within each phonological deviation category were calculated by taking the total number of opportunities for that category (e.g., total number of consonant clusters possible) and dividing by the number of errors within that same category (e.g., number of consonant clusters participant produced in error). Participants had the highest occurrences for stridency deficiencies, postvocalic singleton omissions, and liquid deficiencies (see Table 2). A majority of participants substituted the /h/ for /s/ in consonant sequence patterns (e.g., /ehpexo/ for “espejo”). In addition, most participants omitted final /s/ singleton consonants from words.

Postvocalic singleton omissions, liquid deficiencies, and strident deficiencies were the most frequently occurring errors in all three age groups of the Puerto Rican children. Deficiencies in the strident category were high for all three age groups (45.4, 45.3, and 42.9 respectively). These numbers signify that stridency substitutions are a dialectal feature of Puerto Rican Spanish.

Phonological Skills and Age. In order to determine whether there were group differences in the phonological skills of children based on age, a One-Way Analysis of Variance (ANOVA) was calculated in order to compare TOMPD scores by Age (i.e., 3-, 4-, 5-year-old children). Levene’s Test of Homogeneity of Variance was calculated and

the variances of the groups were not found to be significantly different. Based on the data, ANOVA did not reveal any significant differences between age groups ($F[1,26] = .306, p = .739$).

Comparisons with other investigations. In order to address the third research question regarding how patterns of Puerto Rican children compare with previous investigations of children from Puerto Rico and other dialects (i.e., Mexican, Chilean), the results were compared to previous studies. The results of this investigation are in general agreement with other studies of Spanish-speaking children of Puerto Rican descent (see Tables 4 & 5), with the exception that the current study additionally analyzed phonological productions of 5-year olds.

Table 4: Percentages of Phonological Deviations of 3-year-old Puerto Rican Children (current study; Goldstein & Iglesias, 1996; Stepanof, 1990)

	3-year old Puerto Rican Percentage (Current Study)*	3-year-old Puerto Rican Percentage (Goldstein & Iglesias, 1996)**	3-year-old Puerto Rican Percentage (Stepanof, 1990)***
Omissions			
Syllables	0.8	n/a	3
Consonant Clusters/Sequences	5.8	15.2	20
<i>Consonant Singletons</i>			

Prevocalic	2.2	0.3	0.4
Intervocalic	1.6	n/a	n/a
Postvocalic	9.8	0.3	40
Consonant Category			
Deficiencies			
<i>Sonorants</i>			
Liquids	10.55	6.1	n/a
/l/	n/a	n/a	23
/r/	n/a	n/a	66
Nasals	2.6	n/a	0.5
Glides	6.1	n/a	n/a
<i>Obstruents</i>			
Stridents	45.4	n/a	45
Velars	5.2	n/a	5
Other (Anterior Nonstridents/ Backing)	6.1	n/a	n/a

Table 5: Percentages of Phonological Deviations of 4-year-old Puerto Rican Children
(current study, Goldstein & Iglesias, 1996, Stepanof, 1990)

	4-year old	4-year-old	4-year-old
Phonological Deviation	Puerto Rican	Puerto Rican	Puerto Rican
	Percentage	Percentage	Percentage
	(Current	(Goldstein &	(Stepanof,

	Study)*	Iglesias, 1996)**	1990)***
Omissions			
Syllables	1.8	n/a	0
Consonant			
Clusters/Sequences	6.3	5.6	5
<i>Consonant Singletons</i>			
Prevocalic	3.1	0.0	2
Intervocalic	1.3	n/a	n/a
Postvocalic	15.8	8.6	37
Consonant Category			
Deficiencies			
<i>Sonorants</i>			
Liquids	8.0	2.2	n/a
/l/	n/a	n/a	7
/r/	n/a	n/a	30
Nasals	3.1	n/a	0.8
Glides	7.6	n/a	n/a
<i>Obstruents</i>			
Stridents	45.3	n/a	40
Velars	2.6	n/a	3
Other (Anterior			
Nonstridents/ Backing)	5.2	n/a	n/a

*APPS-2 (Hodson & Prezas, 2010)

**Assessment of Phonological Disabilities (APD) (Iglesias, 1978)

***APPS - older version of APPS-2 (Hodson, 1986)

The results from this current study were compared to previous studies by Goldstein and Iglesias (1996) and Stepanof (1990). The overall patterns were compared as well as the specific phonological deviations of the 3- and 4-year old groups. Five-year-olds were only tested in this current study, thus they were not compared to previous data. As seen in Tables 4 and 5, Goldstein and Iglesias (1996) found liquid substitutions (i.e., liquid simplification) (6.1%) and consonant cluster omissions (15.2%) to be the two most prevalent processes in their 3-year-old participants. In their 4-year-old group, the errors occurred most frequently on postvocalic omissions (8.6%) and again on consonant cluster omissions (5.6%). The highest percent error of occurrence found by Stepanof was on /r/ deviations (66%) in the 3-year-old group. Other high error rates in this age group occurred on stridents (45%), postvocalic omissions (40%), /l/ deviations (23%), and consonant clusters (20%). The numbers shift slightly in the 4-year-old group. Stridency deviations occur in this group at 40% closely followed by postvocalic omissions at 37%, and /r/ deviations at 30%. She also found that stridency substitutions (e.g., *deficiencias de clases estridentes*) averaged about 43% for all participants age 3- to 4-years-old (44.7% in the current study). In addition, postvocalic singleton omissions and liquid substitutions were common among her participants.

Although three different assessment tools were utilized across the Puerto Rican children, the same results were shown. These tests were similar in many ways, as all were single word tests yielding percentages of occurrence for each category. Furthermore, the same manner was used to calculate percentages for all three tests (i.e., the total number of

possibilities for each phonological deviation divided by the number of incorrect productions of each phonological pattern).

Table 6: Percentages of Phonological Deviations of 3- to 5-year-old Puerto Rican, Chilean, and Mexican-American Children

	3- to 5-year old	3- to 5-year-old	3- to 5-year-old
	Puerto Rican	Chilean	Mexican-
Phonological Deviation	Percentage	Percentage	American
	(Current Study)	(Sullenbarger, 2010)	Percentage
			(Prezas, 2008)
Omissions			
Syllables	1.1	n/a	n/a
Consonant	5.8	15.1	5.7
Clusters/Sequences			
<i>Consonant Singletons</i>			
Prevocalic	1.9	0.6	0.0
Intervocalic	1.4	1.3	0.7
Postvocalic	10.8	22.6	1.9
Consonant Category			
Deficiencies			
<i>Sonorants</i>			
Liquids	9.0	13	8.7
Nasals	2.3	1.1	0.5
Glides	5.2	1	2.2

<i>Obstruents</i>			
Stridents	44.7	11.1	1.8
Velars	3.2	4.8	0.7
Other (Anterior Nonstridents/ Backing)	5.4	n/a	n/a
TOMPD	22.7	17.9	10.3

Based on the data, there are certain phonological characteristics that remain through 5 years of age, which most likely signifies a dialectal difference (see Table 6). With an overall TOMPD of 22.7, the Puerto Rican children exhibited a higher percentage than Chilean Children (17.9) and Mexican American children (10.3) who were administered the same assessment (Prezas, 2008; Sullenbarger, 2010). However, all scores from the three dialectal groups still fell within what is considered to be “mild to no disorder” on the APPS-2 assessment. All three of these studies used the same assessment tool with the same administration and scoring procedures.

DISCUSSION

This purpose of this study was to determine the typical phonological characteristics of Puerto Rican children who speak monolingual Spanish. The Spanish phonological patterns of typically developing 3-, 4-, and 5-year old monolingual children were studied and the age group differences were analyzed for significance. Results across all age groups revealed that the following categories of phonological deviations occurred more frequently among participants: stridency substitutions, postvocalic singleton omissions, and liquid substitutions. Stridency substitutions were the most frequently occurring phonological deviation across all age groups, which would be expected due to the frequent dialectal substitution of /h/ for /s/ in Puerto Rican Spanish. Postvocalic singleton omissions primarily occurred on final /s/ words (e.g., *huevos*). Liquid omissions primarily occurred in clusters or in the medial position (e.g. /tefono/ for “telefono”, /bako/ for “barco”, /kema/ for “crema”, and /igesja/ for “iglesia”). A common liquid substitution was /l/ for /r/ (e.g. /balko/ for “barko” and /albol/ for “arbol”). All other phonological pattern categories (e.g., nasals, glides, other anterior nonstridents) occurred less than 9% for all children; which indicates mastery of these phonological processes by the age of five (for participants in this study).

Comparisons with Previous Investigations of Puerto Rican Children

The results from this study were compared to data from a study by Goldstein and Iglesias (1996) and Stepanof (1990). Similar patterns were noted in the children across the studies; however, the three studies did not examine all the same phonological deviation categories. Although stridency substitutions and post-vocalic omissions were

the two most prevalent phonological deviations of the current study, Goldstein and Iglesias did not analyze stridency substitutions in their study. Therefore, a comparison of these patterns was not possible. However, Goldstein and Iglesias did report that cluster reductions among their participants primarily consisted of the deletion of /s/ from a cluster. It is possible that the researchers analyzed cluster reductions of /s/ as an omission, rather than a substitution of /h/ instead. Moreover, as evidenced by another study by Goldstein and Iglesias (November, 1991), the percentages of error patterns can vary greatly depending on which referent is being compared (i.e., whether they take dialect into account). This could also explain deviations in the results of the two studies.

Results from the current study also are in general agreement with the results found by Stepanof (1990). Both investigations yielded high percentages of occurrence for stridency substitution final consonant deletion for all age groups. These data are indicative of dialectal features typical to the Puerto Rican dialect. Although some differences between studies existed (e.g., higher percentage of occurrence for postvocalic singleton omissions in Stepanof), the use of an older version of the APPS-2 in Stepanof's study may have contributed to these differences. Moreover, there were difference in reporting liquids between the original version of the test and the updated version. Variations also may be attributed to the fact that the revision of the APPS included different target words and a slightly altered scoring procedure. It is important to note that the results for the 5-year-old group could not be compared to either study because this age group was not tested in the previous studies.

Comparisons with Other Dialects of Spanish

Based on the data from the current investigation, the participants from Puerto Rico who speak monolingual Spanish exhibit similar phonological patterns of participants in other investigations from other dialects (e.g., Mexican American children, Chilean children); including differences that are dialect specific. The most prominent Puerto Rican dialectal features were as follows: postvocalic omissions, consonant cluster reductions/omissions, and strident deficiencies. The postvocalic omissions coincide with previous research completed on the Cuban and Puerto Rican dialects that found final consonant deletion to be a common feature of their language (Goldstein & Iglesias, 1996). The most common strident deficiencies from this current study were substituting an /h/ for an /s/ such as in the following productions: /espexo/→/ehpexo/, /eskwela/→/ehkwela/, /estufa/→/ehtufa/, /estreja/→/ehtreja/, and /peskado/→/pehkado/. Another common occurrence in this study, that did not constitute an error due to being in the same sound class, was substituting /l/ for /r/ in coda position; such as in the following target words: /arbol/→/albol/, /barko/→/balko/, /flor/→/flol/, and /pwerta/→/pwelta/. Due to the frequency of occurrence across age ranges and across words, the /r/ to /l/ substitution presents as another dialectal feature of Puerto Rican Spanish. Although scores were progressively lower for some categories as the children got older, no significant differences between age groups were found.

Based comparisons of the results from the three different dialects of Spanish, the Puerto Rican children presented with the greatest percentage of prevocalic and intervocalic consonant singleton omissions, nasal deficiencies, glide deficiencies, and strident deficiencies. The Chilean children exhibited the most consonant cluster/sequence and postvocalic omissions as well as the most liquid and velar deficiencies. The Mexican-

American group was the lowest in all areas of omissions and deficiencies with the exception of glide deficiencies. The greatest differences occurred in the consonant cluster/sequence omission category (where the Chilean children exhibited an error rate of 15.1% in comparison to 5.8% for the Puerto Rican children and 5.7% for the Mexican-American children). Chilean children tended to omit the /s/ sound more frequently in clusters than Puerto Rican children, who substitute /h/ instead. Chilean and Puerto Rican participants from the represented studies omitted final consonants more frequently than Mexican-American children. Perhaps the largest phonological pattern difference between represented dialectal studies was stridency substitutions. Puerto Rican had a higher percentage of stridency (44.7%) than Chilean and Mexican-American children (11.1% and 1.8%, respectively). The most frequently occurring phonological patterns for all groups were as follows: strident deficiencies for the Puerto Rican children, postvocalic consonant singleton omissions for the Chilean children, and liquid deficiencies for the Mexican-American children. However, all three groups received TOMPD scores within what is considered to be the “normal” range for development on the APPS-2. Therefore, not one of these three groups would be considered to have a phonological disorder, but would instead be labeled as having dialectal differences.

Clinical Implications

The information gathered from this study (in comparison to previous studies on the Puerto Rican, Chilean, and Mexican-American dialects) highlights the importance of having phonology data for typically developing Spanish-speaking children of different dialects as this will be unique to youngsters in the same linguistic community. SLPs face great challenges when distinguishing between language difference and disorder. The data

from this investigation (compared to previous investigations) does provide hope, however. On a Spanish phonological assessment measure (i.e., APPS-2), typically developing Puerto Rican children, similar to Mexican-American and Chilean counterparts, scored within the “normal” range, regardless of dialectal difference. This is an important finding, because SLPs may use assessments like the APPS-2 as a means to evaluate Spanish-speaking children regardless of dialectal difference. This can be done since the APPS-2 has been shown to be a dialectally resilient assessment tool. For example, based on the results of the current study in comparison to the other investigations of dialect (regardless of dialectal background), typically developing children scored within the normal range on the APPS-2. However, SLPs need to consider the phonological differences between dialects when not using a normed assessment tool like the APPS-2. Clinicians should be aware of these differences when using informal assessment (e.g. narrative/conversation samples) to assess a child’s speech. Difference such as not counting /l/ substitutions for /r/ in coda position in error if child is from a Puerto Rican background are important when considering whether a child qualifies for services. Moreover, practitioners should be aware that final consonant deletion and stridency substitution, as dialectal features, should not be considered errors when assessing a child who speaks monolingual Puerto Rican Spanish. By understanding typical speech sound acquisition for children of different dialects of Spanish, speech language pathologists will be better able to assess and treat children with phonological disorders. Establishing normative data for tests such as the APPS-2 will allow researchers to take a TOMPD and compare it to typically developing Puerto Rican peers. From there,

clinician's have a better chance at properly identifying children for services (Goldstein, 2004).

Study Limitations and Future Research

As with all studies, there were certain limitations to this study. Although significant differences across age groups were expected, there are possible explanations for a lack of significant differences between age groups. For instance, outliers within the study could have affected the accuracy of the data. Furthermore, a larger sample size would have strengthened the investigation. Additional studies involving a larger number of participants may yield additional information about age groups. Data on 2-, 6-, and 7-year-old Puerto Rican children would have offered a more complete picture of phonological development in this population, specifically to determine if there is a significant change in the phonological skills from 2 to 3 years of age. Moreover, investigations of additional phonological deviation patterns (e.g., stopping) may provide a more complete picture of the patterns of phonological development in Puerto Rican preschoolers.

Further research is necessary to continue to increase proper diagnosis of phonological disorders. First, Puerto Rican Spanish needs to be studied in greater detail (e.g. assessing a greater amount of children) to aid clinicians in the assessment and treatment process of school-age children. Studies are still needed investigating other dialects of Spanish. In addition, studies of bilingual (Spanish-English) children from various Spanish dialects are needed here in the United States as that is the clientele that SLPs will frequently diagnose and treat.

CONCLUSION

This present study endeavored to investigate the typical phonological characteristics of Puerto Rican children who speak monolingual Spanish. Spanish phonological patterns of typically developing 3- to 5-year-old monolingual children were studied. Each age group was cross-examined to determine if any significant developmental differences between groups existed. Bilingual graduate students from Texas Christian University administered the APPS-2 to twenty-seven children in educational centers in San Juan, Puerto Rico. The average TOMPD for all twenty-seven children was found to be 22.7. The most frequently occurring phonological pattern across all age groups was stridency deficiencies, postvocalic singleton omissions, and liquid deficiencies. These occurred at an average of 44.7%, 10.8%, and 9%, respectively, for all three age groups combined. This is consistent with the common dialectal substitution of /h/ for /s/ in Puerto Rican Spanish. Between age groups, no significant differences were noted in TOMPD averages. Compared to previous studies, the Puerto Rican children exhibited greater TOMPD (22.7) than Chilean children (17.9) and Mexican-American children (10.3) who were administered the same assessment (Prezas, 2008; Sullenbarger, 2010). Furthermore, they exhibited similar error patterns as seen in previous research on Puerto Rican preschoolers. Similar error patterns were shown across dialects, with liquid deficiencies being one of the top three deviations for all three groups. Further research is needed to aid SLPs in the diagnosis and treatment process of Spanish-speaking children with language disorders. This and similar research will aid SLPs in distinguishing between a language difference and disorder in diverse populations; thus protecting children from misdiagnosis.

APPENDICES

APPENDIX A

Sample permission letter from data collection site.

mm/dd/yyyy

To the TCU Institutional Review Board:

Raul Prezas, Ph.D., and his co-investigators at Texas Christian University have our permission to conduct the study “An investigation of bilingual preschool children’s intelligibility in Spanish and English: Evaluating phonological productions in both languages and across dialects ” at [*name of child care center*]. We will provide the researchers with space to work with the children, and we will work with the researchers to minimize disruption to our and the children’s routine. All researchers who visit the school must have criminal background checks, document that they are free of active tuberculosis and comply with other DFPS regulations pertaining to volunteers and contractors in child care centers who are not counted in child/caregiver ratio.

This permission is contingent on continued approval of the study by the TCU Institutional Review Board. In addition, we may withdraw this permission at any time. The participation of each child is also contingent upon parent permission, which may be withdrawn at any time by the parent. We understand that doing so will not affect our relations with TCU.

Printed name of director

Signature of director

Date

APPENDIX B

Parent Letter

Estimados Padres de la Familia:

En Texas Christian University, nosotros estamos estudiando la pronunciación de los sonidos en español de los niños de habla hispana. Invitamos a que su niño participe en un estudio de los sonidos del habla y lenguaje en español. Esperamos adquirir más información sobre los sonidos del habla y el vocabulario de niños (3-5 años de edad) de los Estados Unidos y Puerto Rico. Esta información será utilizada para mejorar los materiales de evaluación del habla y lenguaje para niños de habla hispana.

El estudio consiste en que los niños nombren objetos y dibujos. Nosotros escribiremos los sonidos que dicen los niños y también los grabaremos. Además, les pediremos que nos cuenten una historia en español que acaban de oír. Las actividades tomarán aproximadamente 50 minutos.

Si ustedes permiten que su niño participe en este estudio, por favor firmen la autorización y contesten las preguntas que aparecen en la página siguiente. Si tienen preguntas acerca de la investigación antes de firmar el documento, me pueden ponerse en contacto a cualquier tiempo (vea información para contactar abajo). Si no quieren que su niño participe en este estudio, no tienen que responder a esta invitación.

Atentamente,

Tara Hepler, Master's Student

Department of Communication Sciences and Disorders

TCU Box 297450

Fort Worth, TX 76132

Phone: 817-257-7620

Email: t.c.hepler@tcu.edu

Dear Parents/Caregivers:

At Texas Christian University, we are studying the Spanish speech sounds of children from a Hispanic background. Your child is invited to participate in a study of speech sounds and vocabulary in Spanish. We hope to collect more information about the speech sounds and vocabulary of children (3-5 year olds) from the United States and Puerto Rico. This information will be used to improve speech/language testing materials for Spanish-speaking children.

The study consists of having children name objects and pictures. Children's responses will be written down and audio recorded. In addition, we will have your child retell a story in Spanish. The process will last approximately 50 minutes.

If you give permission for your child to participate in this study, please sign the consent form and answer the questions that appear on the subsequent page. If you have any questions about the study before signing the document, you may contact me at any time (see contact information below). If you do not wish to give permission for your child to participate, you do not need to respond to this invitation.

Sincerely,

Tara Hepler, Master's Student

Department of Communication Sciences and Disorders

APPENDIX B (Continued)

TCU Box 297450
Fort Worth, TX 76132
Phone: 817-257-7620
Email: t.c.hepler@tcu.edu

APPENDIX C



Texas Christian University
Fort Worth, Texas

PARENT'S PERMISSION TO PARTICIPATE IN RESEARCH

Title of Research: An investigation of bilingual preschool children's intelligibility in Spanish and English: Evaluating phonological productions in both languages and across dialects

Funding Agency/Sponsor: Texas Christian University

Study Investigators: Raul Prezas, Ph.D., Tara Hepler, Elizabeth Thornhill, Carah Sullenbarger

What is the purpose of the research? The purpose of this study is to evaluate the speech sounds of Spanish-speaking children. We hope to collect more information about the speech sounds of children (3-5 year olds) from the United States and Puerto Rico. This information will be used to improve speech/language testing materials for Spanish-speaking children.

How many children will take part in this study? A total of 120 children will participate in this investigation. Your child was selected to be a participant in this survey because your child is part of the Head Start Program, is between 3 and 5 years-old, comes from a Hispanic background, and speaks Spanish.

What is my and my child's involvement for taking part in this study? You will be asked to fill out a questionnaire on behalf of your child. Your child will be presented with speech/language tests in Spanish and English at the Head Start center during regular program hours.

For how long is my child expected to be in this study, and how much of my child's time is required? Testing will last approximately 50 minutes and may take more than one day. The moderator will make note of your child's responses on a form and audio-record the session in order to document the result

APPENDIX C (Continued)

What are the risks of taking part in this study and how will they be minimized? There are minimal risks or discomforts associated with participation in this study. One potential risk is frustration due to the administration of different protocol. Assessment protocols are designed to minimize frustration. If at any time during the session your child indicates that he/she is tired or your child is showing fatigue, a short break from the testing will be provided. Breaks will be offered to your child at least one-two times per session and will consist of game/play activities (e.g., house, board game). Before testing resumes, your child will be asked if he/she wants to continue testing. Testing will continue only if your child indicates a “yes” response.

What are the benefits for taking part in the study? Should you choose to allow your child to participate in this study, he/she will receive a free evaluation of speech/language and be part of a project that attempts to obtain information regarding speech and language of Spanish speaking children. This information will serve as a foundation to help develop adequate testing materials for Spanish-speaking children. A great need for testing materials designed to assess Hispanic children exists. With you and your child’s help, we can continue to better serve and assist the Spanish-speaking population.

Will I be compensated for taking part in the study? No

What is an alternate procedure(s) that I can choose instead of having my child take part in this study? None

How will my child’s confidentiality be protected? Any information obtained in this study in which you or your child can be identified will remain confidential (in a locked file cabinet) and will only be disclosed with your permission. Your child will be assigned and represented by a number in order to protect your child’s privacy.

Is my child’s participation voluntary? in this study is entirely voluntary. Your decision whether or not to participate will not affect your future relations with Texas Christian University or the school program.

Can my child stop taking part in this research? If you and your child agree to participate in this study, you are free to withdraw from the study at any time without penalty.

What are the procedures for withdrawal? You may either tell the investigators directly, send a letter or an e-mail indicating that you no longer wish your child to be a part of the study and they will be released from participation.

Will I be given a copy of the permission document to keep? Yes.

APPENDIX C (Continued)

Who should I contact if I have questions regarding the study? If you have any questions about this research, including additional questions pertaining to your child's rights as a research participant, please contact: Raúl Prezas, telephone (817) 257-4450.

Who should I contact if I have concerns regarding my child's rights as a study participant?

Dr. Brad Lucas, Chair, TCU Institutional Review Board, Telephone 817 257-6981.

Dr. Janis Morey, Director, Sponsored Research, Telephone 817 257-7516.

Your signature below indicates that you have been read the information provided above, you have received answers to all of your questions and have been told who to call if you have any more questions, you have freely allowed your child to participate in this research, and you understand that you are not giving up any of your legal rights.

Child's Name (please print):

Date of birth: _____

Parent's Name (please print):

Parent's Signature: _____

Date: _____

Investigator's Signature: _____

Date: _____

APPENDIX C (Continued)



Texas Christian University
Fort Worth, TX

CONSENTIMIENTO DEL PADRES PARA PARTICIPAR EN INVESTIGACIONES

Titulo de investigación: An investigation of bilingual preschool children's intelligibility in Spanish and English: Evaluating phonological productions in both languages and across dialects

Agencia financiera/patrocinador: Texas Christian University

Investigadores: Raul Prezas, Ph.D., Tara Hepler, Elizabeth Thornhill, Carah Sullenbarger

¿Cuál es el propósito de esta investigación?

El propósito de esta investigación será para evaluar los sonidos de los niños que hablan español. Esperamos adquirir más información sobre los sonidos del habla de niños (3-5 años de edad) de los Estados Unidos y de Puerto Rico. Esta información será utilizada para mejorar los materiales de evaluación del habla y lenguaje para niños de habla hispana.

¿CUÁNTOS niños participarán en esta investigación?

Participarán 120 niños en esta investigación. Fueron seleccionados a participar en este estudio porque está, igual que su niño, en el programa escolar, tienen entre 3 y 5 años, tiene parentesco hispano, y habla español.

¿Qué tengo yo y mi niño que hacer en esta investigación?

Se le pedirá a usted llenar un cuestionario sobre su niño. Su niño será presentado con las pruebas de habla y lenguaje en español y también en inglés (si bilingüe).

¿Cuánto tiempo toma la investigación de mi niño y cuánto tiempo se requiere de mi niño?

Las actividades durarán aproximadamente 50 minutos y hay posibilidad de que vayan a durar más de un día. Todas las actividades tomarán lugar en Head Start durante las horas regulares. El asesor escribirá las respuestas de su niño en una forma y grabará la sesión para documentar los resultados y las diferencias entre participantes.

APPENDIX C (Continued)

¿Cuáles son los riesgos relacionados con este proyecto y como serán minimizados?

Los riesgos serán mínimos durante esta participación. Un riesgo potencial es frustración debido a la administración de protocolo diferente. Los protocolos de la evaluación son diseñados para minimizar frustración. Si durante la sesión su niño parece estar cansado o está demostrando fatiga en cualquier momento, una pausa corta será proporcionada. Pausas será ofrecido a su niño por lo menos una y dos veces por la evaluación y constará de juegos/actividades de juego (por ejemplo, casa, juego de Antes de recomenzar la prueba, se le preguntará a su niño si él/ella desea continuar participando. La prueba continuará solamente si su niño dice "sí."

¿Cuáles son los beneficios de participar en esta investigación?

Si usted elige permitir a que su niño participe en este estudio, él/ella recibirá una evaluación del habla y lenguaje gratis y será parte de un proyecto con las esperanzas de obtener información con respecto al habla y lenguaje de niños que hablan español. Esta información servirá como fundación al desarrollamiento de materiales mejores para los niños de habla hispana. Una gran necesidad existe para materiales que son precisos para los niños hispánicos. Con ayuda de su niño, podemos continuar mejorando servicio a la población de habla hispana.

¿Recibiré compensación por participar en esta investigación?

Usted no recibirá ninguna compensación monetaria por participar en esta investigación.

¿Qué puedo hacer en vez de participar en esta investigación?

Nada.

¿Cómo se protegerá la confidencialidad de mi niño?

Cualquier información obtenida en este estudio en el cual usted o su niño puedan ser identificados se mantendrá confidencial (se quedará en un gabinete cerrado) y será divulgada solamente con su permiso. Un número será asignado y representará a su niño para proteger la identidad de su niño.

¿Es la participación de mi niño voluntaria?

La participación en este estudio es completamente voluntaria. Su decisión de si o no participar no afectará sus relaciones futuras con Texas Christian University o con el programa escolar. Si quiere que su niño participe en este estudio, tiene la libertad de retirarse del estudio en cualquier momento sin repercusión.

¿Puede parar de participar mi niño en esta investigación?

Si quiere que su niño participe en este estudio, tiene la libertad de retirarse del estudio en cualquier momento sin repercusión.

¿Cuáles son los procedimientos para retirarse de la investigación?

APPENDIX C (Continued)

Usted puede retirarse en cualquier momento después de haber firmado esta forma si es que desea terminar su participación. Usted le puede informar al investigador si quiere retirarse de la investigación. Usted puede retirarse verbalmente o por escrito.

¿Se me dará una copia de los documentos de consentimiento para mis expedientes?
Sí.

¿A quién debo contactar si tengo preguntas acerca de la investigación?

Si usted tiene cualquier pregunta sobre esta investigación, incluyendo otras preguntas sobre los derechos de su niño en la investigación, puede llamar a: Raúl Prezas, teléfono (817) 257-4450.

¿A quién debo contactar si tengo dudas acerca de mis derechos como participante de la investigación?

Dr. Brad Lucas

Director de la Mesa Directiva de Investigaciones Institucionales de TCU

Teléfono 817-257-7665.

Su firma indica que usted ha leído la información provista arriba, a usted se le ha informado que llame si tiene más preguntas, usted ha decidido por su propia cuenta participar en esta investigación, y usted comprende que no está cediendo sus derechos legales.

Nombre del niño (letra de molde): _____

Fecha de Nacimiento _____

Nombre del Padre (letra de molde): _____

Firma del padre: _____

Fecha: _____

Firma del investigador: _____

Fecha:

APPENDIX D

HIPPA Forms

Protected Health Information Authorization Form

As a subject in the studies entitled “An investigation of bilingual preschool children’s intelligibility in Spanish and English: Evaluating phonological productions in both languages and across dialects” you will be asked to provide protected health information about your child. The information may be obtained by either verbal question and answer format (e.g., one on one interview) or by a questionnaire. For the purpose of this research project, you will be asked information in relation to: assessment and therapy of speech, language, cognition, and/or swallowing. Your child’s protected health information will be confidential by being de-identified and coded in such a way that it will not be able to be identified by his/her name or initials. Your child’s information will be stored in a locked cabinet when not in use and only the appropriately designated research personnel will have access to your protected health information. All of your child’s protected health information will be kept private. The data may be reported in publications or presentations but will be expressed as an average for the group without any reference to the individual results. There may be the possibility that your child’s protected health information may need to be accessed once the study has ceased. If so, the information will be re-identified using a different coding procedure such that your information continues to remain confidential.

This form is designed to inform you of the procedures involved in the collection and use of your child’s protected health information to be utilized in the study, and to obtain your authorization to collect and utilize the information. If you still have questions, please feel free to ask now or at any time during the study.

Your child’s health information will be shared at TCU with people who are involved in the research project. We may also share your information with others outside of TCU who are sponsoring the research.

By signing this form, you are agreeing to allow Raul Prezas, PhD, Tara Hepler, Elizabeth Thornhill, and Carah Sullenbarger (graduate students in Communication Sciences and Disorders) to use and share your health information in this research study with the following person(s) or organization(s).

APPENDIX D (Continued)

If you change your mind later and do not want us to collect or share your child's health information, you should contact the researcher listed below by telephone or by letter. You need only say that you do not wish to have the researcher collect and share your health information.

I _____ authorize collection of the protected health information outlined above. I have read the description of the procedures in the collection and use of my protected health information, the procedures have been explained to me, and my questions have been answered to my satisfaction.

The chair of the TCU Institutional Review Board is Dr. Brad Lucas; Dr. Lucas can be reached by phone at 817.257.7665. The director of Sponsored Research at TCU is Dr. Janis Morey; Dr. Morey can be reached by phone at 817.257.4877.

Date _____

Participant's signature (please place your initials to the right of each of the previous paragraphs indicating that the consent form has been verbally discussed with you.)

Principal Investigator

Signature of Witness

APPENDIX E

Child Assent

Participant # _____

Research staff to child

1. Make direct eye contact with child and smile.
2. Prompt the child to look directly at you and listen.
3. Say “We would like to work with you for a little while. We are going to look at some pictures, tell a story, and play with some toys. Would you like to work with us?”

Potential Indicators of Assent

1. Saying “yes,” “uh-huh” or a phrase or sound that the parent/guardian or teacher indicates as affirmative.
2. Smiling, nodding, touching the experimenter, or other physical actions that indicate interest in the interaction.

Child indicated yes.

Child indicated no.

Investigator Signature

Date

APPENDIX F

Questionnaire

Dear parents/caregivers:

Please answer the following questions. The information that you provide us is confidential.

Parent's Name: _____ Date: _____

Child's Name: _____ Date of Birth: _____

Age: _____ Gender: _____ Center: _____

Demographic Information:

How many adults live in the household? ____ How many children live in the household? ____

How many children in the home are: Younger than the child? ____ Older than the child? ____

Parent Information: Mother Father

Birth place: _____

Educational History: _____

Circle the regional background(s) that best identifies your child's nationality:

Mexican Cuban Puerto Rican Central American South American

Other nationality: _____

Child's birth place: _____

Languages Used:

Please check which languages your child speaks in the home: Spanish ____ English ____

Other language(s) (please list) _____

At what age did your child start speaking: Spanish? ____ English? ____ Other? ____

What language was used at home and at school/daycare when your child was growing up?

	<u>At home</u>			<u>At school/daycare</u>		
Spanish	English	Both Span/Eng	Spanish	English	Both Span/Eng	

Child's age
0-1 years _____

APPENDIX F (Continued)

1-2 years	_____	_____	_____	_____	_____	_____
2-3 years	_____	_____	_____	_____	_____	_____
3-4 years	_____	_____	_____	_____	_____	_____
4-5 years	_____	_____	_____	_____	_____	_____

How well does your child **speak Spanish**? Choose one:

_____ Cannot speak Spanish, has a few words or phrases, cannot produce sentences, only understands a few words

_____ Cannot speak Spanish language, has a few words or phrases, understand the general idea of what is being said

_____ Speaks Spanish with grammatical errors, limited vocabulary, understands the general idea of what is being said

_____ Speaks Spanish well with some grammatical errors, some social and academic vocabulary, understands most of what is said

_____ Speaks Spanish very well with few grammatical errors, good vocabulary, understands most of what is said

How well does your child **speak English**? Choose one:

_____ Cannot speak English, has a few words or phrases, cannot produce sentences, only understands a few words

_____ Cannot speak English, has a few words or phrases, understand the general idea of what is being said

_____ Speaks English with grammatical errors, limited vocabulary, understands the general idea of what is being said

_____ Speaks English well with some grammatical errors, some social and academic vocabulary, understands most of what is said

_____ Speaks English very well with few grammatical errors, good vocabulary, understands most of what is said

How often does your child **use Spanish**? Choose one:

_____ Never speaks Spanish, never hears it

_____ Never speaks Spanish, hears it very little

_____ Speaks Spanish, hears it sometimes

_____ Speaks Spanish sometimes, hears it most of the time

_____ Speaks Spanish all of the time and hears it all of the time

How often does your child **use English**? Choose one:

APPENDIX F (Continued)

- _____ Never speaks English, never hears it
- _____ Never speaks English, hears it very little
- _____ Speaks English, hears it sometimes
- _____ Speaks English sometimes, hears it most of the time
- _____ Speaks English all of the time and hears it all of the time

How often does your child use a **language other than Spanish or English**? Please list which language(s) _____ Choose one:

- _____ Never speaks another language, never hears it
- _____ Never speaks another language, hears it very little
- _____ Speaks another language, hears it sometimes
- _____ Speaks another language sometimes, hears it most of the time
- _____ Speaks another language all of the time and hears it all of the time

Circle the percentage of time that the child is exposed to each language at home

English:	100%	80%	60%	40%	20%
	0%				
Spanish:	0%	20%	40%	60%	80%
	100%				

When speaking with your child, what languages are used? (Mark below for each person)

	Spanish	English	Both Span/Eng	Other Language(s) (please list)
1) Mother uses:	_____	_____	_____	_____
Child answers using:	_____	_____	_____	_____
2) Father uses:	_____	_____	_____	_____
Child answers using:	_____	_____	_____	_____
3) Older siblings use:	_____	_____	_____	_____
Child answers using:	_____	_____	_____	_____
4) Younger siblings use:	_____	_____	_____	_____
Child answers using:	_____	_____	_____	_____

APPENDIX F (Continued)

- 5) Other persons
in the home use: _____
Child answers using: _____

When **adults** speak to one another in the home, what is the preferred language?

Spanish _____ English _____ Both _____

Other (please list) _____

When **children** speak to one another in the home, what is the preferred language?

Spanish _____ English _____ Both _____

Other (please list) _____

Which language does your child use more in the home? _____

Which language is spoken most often to your child in the home? _____

Speech, Language, and Hearing Information:

Has your child ever had any speech or language difficulties? Yes _____ No _____

If "Yes," please describe: _____

Has your child ever had a speech language evaluation? Yes _____ No _____

If "Yes," did your child receive services? Yes _____ No _____

Has your child ever had ear infections? Yes _____ No _____

If "Yes," how many? _____

Do family members have trouble understanding your child's speech?

Yes _____ No _____

Do persons outside the family have difficulty understanding your child's speech?

Yes _____ No _____

Are you worried about your child's speech and/or language?

Yes _____

Please explain _____

No _____

APPENDIX F (Continued)

Additional Comments:

Cuestionario

Estimados Padres de Familia:

Favor de contestar las siguientes preguntas. La información que nos otorga permanecerá confidencial.

Nombre de padre o madre: _____ Fecha: _____

Nombre del niño/a: _____ Fecha de nacimiento: _____

Edad: _____ Sexo: _____ Centro: _____

Información Demográfica:

¿Cuántos adultos viven en la casa? _____ ¿Cuántos niños viven en la casa? _____

¿Cuántos niños en el hogar son: menor que el niño/a? ____ mayor que el niño/a? ____

Información parental: Madre Padre

Lugar de nacimiento _____

Historia educacional _____

Cheque el origen de nacionalidad que mejor identifique a su niño/a:

mexicano cubano puertorriqueño centroamericano sudamericano

otra nacionalidad _____

Lugar de nacimiento del niño/a _____

Uso de idiomas

¿Qué idiomas usa su hijo en casa? español _____ inglés _____

Otros idiomas _____

APPENDIX F (Continued)

¿A qué edad empezó a hablar su hijo/a? español? _____ inglés? _____ otro idioma?

¿Qué idioma se usó en casa y en la escuela/guardería al desarrollarse su hijo/a?

Edad del niño/a	En casa			en la escuela/guardería	
	español	inglés	ambos	español	inglés
ambos 0-1 Año	_____	_____	_____	_____	_____

1-2 años	_____	_____	_____	_____	_____

2-3 años	_____	_____	_____	_____	_____

3-4 años	_____	_____	_____	_____	_____

4-5 años	_____	_____	_____	_____	_____

¿Qué tan bien habla su hijo/a **el español**? Escoja una respuesta:

_____ No puede hablar español, usa algunas palabras o frases, no dice oraciones, solo entiende algunas palabras

_____ No puede hablar español, usa algunas palabras o frases, entiende la idea general de lo que se dice en español

_____ Habla español con errores gramaticales, vocabulario limitado, entiende la idea general de lo que se dice en español

_____ Habla español bien con algunos errores gramaticales, tiene limitado vocabulario social y académico, entiende la mayoría de lo que se dice en español

_____ Habla español muy bien con pocos errores gramaticales, buen vocabulario, entiende la mayoría de lo que se dice en español

¿Qué tan bien habla su hijo/a **el inglés**? Escoja una respuesta:

_____ No puede hablar inglés, usa algunas palabras o frases, no dice oraciones, solo entiende algunas palabras

_____ No puede hablar inglés, usa algunas palabras o frases, entiende la idea general de lo que se dice en inglés

_____ Habla inglés con errores gramaticales, vocabulario limitado, entiende la idea general de lo que se dice en inglés

APPENDIX F (Continued)

_____ Habla inglés bien con algunos errores gramaticales, tiene limitado vocabulario social y académico, entiende la mayoría de lo que se dice en inglés

_____ Habla inglés muy bien con pocos errores gramaticales, buen vocabulario, entiende la mayoría de lo que se dice en inglés

¿Qué tan seguido usa su niño/a **el español**? Escoja una opción:

_____ Nunca habla español, nunca lo oye

_____ Nunca habla español, lo oye un poquito

_____ Habla español, lo oye un poquito

_____ Habla español a veces, lo oye la mayoría del tiempo

_____ Habla español la mayoría del tiempo y lo oye la mayoría del tiempo

¿Qué tan seguido usa su niño/a **el inglés**? Escoja una opción:

_____ Nunca habla inglés, nunca lo oye

_____ Nunca habla inglés, lo oye un poquito

_____ Habla inglés, lo oye un poquito

_____ Habla inglés a veces, lo oye la mayoría del tiempo

_____ Habla inglés la mayoría del tiempo y lo oye la mayoría del tiempo

¿Qué tan seguido usa su niño/a un **idioma que no sea el español o el inglés**? Por favor haga una lista de los otros idiomas _____ Escoja una opción:

_____ Nunca habla otro idioma, nunca lo oye

_____ Nunca habla otro idioma, lo oye un poquito

_____ Habla otro idioma, lo oye un poquito

_____ Habla otro idioma a veces, lo oye la mayoría del tiempo

_____ Habla otro idioma la mayoría del tiempo y lo oye la mayoría del tiempo

Cheque el porcentaje de tiempo que su hijo/a está expuesto a cada idioma en casa:

Inglés: 100% 80% 60% 40% 20% 0%

Español: 0% 20% 40% 60% 80% 100%

¿Cuando le habla a su hijo/a, que idiomas usa? (marque a siguiente para cada persona)

	español	inglés	ambos esp/ing	otros idiomas (favor de indicar qué idioma)
1) Madre usa:	_____	_____	_____	_____
El niño/a contesta:	_____	_____	_____	_____
2) Padre usa:	_____	_____	_____	_____
El niño/a contesta:	_____	_____	_____	_____

APPENDIX F (Continued)

3) Hijos/as mayores usan: _____
 El niño/a contesta: _____

4) Hijos/as menores usan: _____
 El niño/a contesta: _____

5) Otras personas en
 la casa usan: _____
 El niño/a contesta: _____

¿Cuando **adultos** hablan entre si en la casa, cuál es el idioma preferido?
 Español _____ Inglés _____ Ambos _____ Otro idioma _____

¿Cuándo niños hablan entre si en la casa, cuál es el idioma preferido?
 Español _____ Inglés _____ Ambos _____ Otro idioma _____

¿Cuál idioma usa su hijo/a la mayoría del tiempo en la casa?

¿Cuál idioma se usa la mayoría del tiempo en la casa?

Información de habla, lenguaje y audición:

¿Ha tenido su hijo/a algún tipo de dificultades con su habla o lenguaje? Si _____ No _____
 Si contestó que sí, favor de describir la dificultad _____

¿Ha tenido su hijo/a una evaluación del habla y lenguaje? Si _____ No _____
 Si contestó que sí, ¿recibe su hijo/a servicios? Si _____ No _____

¿Ha tenido su hijo/a infecciones del oído? Si _____ No _____
 Si contestó que sí, ¿Cuántas ha tenido? _____

¿Hay familiares que tienen dificultad de entender el habla de su hijo/a? Si _____ No _____

¿Tiene dificultad la gente ajena en entender el habla de su hijo/a? Si _____ No _____

¿Está usted preocupado por el habla y/o lenguaje de su hijo/a?
 Si _____ Favor de explicar _____
 No _____

Comentarios adicionales:

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EDUCATION

Texas Christian University – Fort Worth, TX

- Master of Science in Speech-Language Pathology December 2010
- Emphasis in Bilingual Speech-Language Pathology
- PRAXIS: passed 11/13/ 2010
- Cumulative GPA: 3.8

James Madison University – Harrisonburg, VA

- Bachelor of Arts in Communication Sciences and Disorders May 2008
- Bachelor of Arts in Spanish May 2008
- Universidad de Salamanca** – Salamanca, Spain Summer 2007

CLINICAL EXPERIENCE

Miller Speech and Hearing Clinic – Texas Christian University

January 2009 – December 2010

Fort Worth, TX

Graduate Student Clinician

- Conducted diagnostic assessments of speech and language for both adults and children in English and Spanish
- Provided treatment in English and Spanish to children and adults with speech and language disorders, including language delay, phonological disorders, language problems related to hearing impairment, aphasia, cleft palate, accent reduction, Down's Syndrome, Autism, fluency and voice
- Performed audiological screenings at the clinic and various school sites

D. Wayne Tidwell Voice Center – Baylor All Saints Medical Center - Fort Worth, TX

May 2010 – July 2010

Clinical Externship

- Administered formal assessments of voice and acoustics
- Created formal evaluation reports and selected treatment goals and objectives
- Conducted treatment for individuals with a wide variety of voice disorders
- Counseled and educated patients and their families about the anatomy/physiology of voice production, vocal hygiene, and vocal abuse
- Administered formal bedside swallowing assessments

Cook Children's Medical Center – Arlington, TX

January 2010 – April 2010

Clinical Externship

- Assessed and treated English and Spanish children in an outpatient setting
- Created formal reports and provided family education
- Administered Auditory Verbal Therapy (AVT) on children with cochlear implants and hearing aids

Head Start- Fort Worth, TX

January 2009- December 2009

Graduate Student Clinician

- Screened children's receptive and expressive language, speech sounds, and language proficiency
- Formally assessed and treated children's speech and language in English and Spanish

RELEVANT EXPERIENCE/ACCOMPLISHMENTS

Master's Thesis

- Phonological productions of Puerto Rican, monolingual Spanish-speaking children
- Research conducted in San Juan, Puerto Rico in March, 2010

Second Language

- Near-native proficiency in verbal and written Spanish

PROFESSIONAL AFFILIATIONS

National Student Speech Language and Hearing Association

2007-2010

ABSTRACT

PHONOLOGICAL PRODUCTIONS OF PUERTO RICAN SPANISH-SPEAKING PRESCHOOLERS

The purpose of this study was to investigate the phonological patterns of Spanish-speaking Puerto Rican preschoolers. Twenty-seven typically developing children of Puerto Rican descent were identified as participants. Ages ranged from 3;0 to 6;1, with a mean age of 4;4. There were a total of 15 boys and 12 girls. The children came from three educational centers in the San Juan area of Puerto Rico. The children were administered the Assessment of Phonological Processes-Spanish (APPS-2). The data gathered were compared to previous data gathered from Puerto Rican, Chilean, and Mexican-American preschoolers. The average TOMPD for all twenty-seven children was found to be 22.7. The most frequently occurring phonological patterns across all age groups were stridency deficiencies, postvocalic singleton omissions, and liquid deficiencies. Between age groups, no significant differences were noted in TOMPD scores. The children in the study exhibited similar error patterns as seen in previous studies on Puerto Rican preschoolers. Compared to previous studies across other dialects of Spanish, the Puerto Rican children exhibited greater TOMPD scores (22.7) than Chilean children (17.9) and Mexican-American children (10.3) who were administered the same assessment. Similar error patterns were shown across all dialects, with liquid deficiencies being one of the top three deviations for all three groups. All children scored within the “normal” range on the assessment tool. Therefore, there are specific dialectal features of Puerto Rican Spanish, such as substitution of the /h/ for the /s/, which should be considered a dialectal difference when assessing a child for services. Information such as this will assist SLPs in distinguishing between a language difference and disorder in diverse populations.

by Tara Hepler, M.S., 2010
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