

Parent report as a screening tool of speech disorders in Spanish-speaking
preschool children

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completed by

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Introduction

Forty-six million people in the United States speak a language other than English (Bergman, 2003). With 28 million Spanish speakers, Hispanics are one of the fastest growing populations (Bernstein, 2004). Our nation's diversity is reflected in the large numbers of linguistically diverse students who are educated in public schools each year. Of the 20 million preschoolers in the United States, 10% are Hispanic. Consequently, educators and specialists within the school system are often faced with the task of providing services for students and families who speak Spanish, and a variety of other languages. Speech language pathologists (SLPs) employed by school districts face the challenge of providing services for the increasing numbers of linguistically diverse children who appear on their caseloads. Screening and assessing the speech of linguistically diverse children is a difficult task for a number of reasons. Public Law 94-142 mandates that assessments of communicative abilities be conducted in a child's native language (Turnbull & Turnbull, 2000). However, 94% of speech language pathologists are monolingual English speakers (Roseberry-McKibbin, Brice, & O'Hanlon, 2005). To provide appropriate services to children in a language they don't speak, speech language pathologists must collaborate with interpreters. Securing the services of an interpreter can be a daunting task however, as they are often unavailable and/or untrained, or their services are cost prohibitive (Roseberry-McKibbin, Brice, & O'Hanlon, 2005). This mismatch between the needs of children and the services SLPs are able to provide, is a growing dilemma which could be addressed with the use of

screening and assessment tools that draw on parents' knowledge of their children's speech skills.

Speech disorders affect an estimated 10% to 15% of preschool children, and approximately 6% of school age children (Plante & Beeson, 1999). Despite this high incidence, few assessment tools exist which would allow SLPs to differentially diagnose speech disorders in linguistically diverse populations. Early treatment of speech disorders has been shown to improve intelligibility and therefore reduce potential negative impacts on social and academic development (Gierut, 1998). However, the benefits of treatment can only be realized if a valid and reliable assessment tool exists which can be used to identify children who are in need of services.

When assessing the speech of a monolingual English child, speech language pathologists often use standardized screening tools to gather norm referenced information which assists in the identification of children with disorders. However, when assessing linguistically diverse children, the use of standardized assessments is often inappropriate given commonly occurring mismatches between the standardization sample and the population being tested. While speech language pathologists have been encouraged to use dynamic assessment and informal, play-based procedures to assess linguistically diverse children (Hadley & Rice, 1993), dynamic assessment maybe more appropriately used to identify language impairment rather than speech disorders, as it is primarily a method designed to assess how students learn, retain, and transfer information (Bender, 2005). Both play-based, and dynamic assessment methods

require a considerable amount of time, and are therefore not efficient screening tools. In addition, very little research exists outlining developmental norms for languages other than English, and any information gathered using informal and/or formal assessment procedures is difficult to analyze reliably.

Parent report protocols have been used successfully to assess children's early language development between the ages of 12 and 30 months (Dale, 1991; Rescorla & Alley, 2001), and are now widely used as an important component of comprehensive speech and language assessments. Families serve as sources of information that specialists utilize for diagnosis and treatment purposes. Parent report-based assessment instruments such as the MacArthur Communicative Development Inventory (Fenson et al., 1993) and its Spanish equivalent, Fundacion MacArthur Inventario del Desarrollo de Habilidades Comunicativas (Jackson-Maldonado et al., 2003), have been shown to be valid measures of vocabulary and syntax, in both mainstream English and Spanish speaking toddlers (Thal, Jackson-Maldonado, & Acosta, 2000). Recently, parent report protocols have also been shown to be a valid means of identifying linguistically diverse older children with language impairment. Restrepo (1998) found parent report to be a valid means of identifying predominantly Spanish speaking children, ages 5 to 7 years, with language impairment. Systematic parent interviews were shown to reveal accurate information regarding language skills (Dale, Bates, Resnick, & Morrisset, 1989; Restrepo, 1998). Curiously, in the preschool years, from ages 3 to 5, assessment procedures that utilize parent report protocols are less

common. However, the information that valid parent report procedures could reveal would be invaluable to SLPs working within school systems, especially in cases of linguistically diverse students.

While parent reports are a widely used means of assessing children's language skills, the validity of parents' assessments of preschoolers' speech skills is unknown. The features of language impairment may be more obvious to parents than those of speech disorders. While some studies suggest parents' judgments of preschoolers' speech and language skills are valid (Hadley & Rice, 1993), very little research exists examining the validity of parent report protocols as a means of assessing preschoolers' speech skills apart from language.

Many of the assessment procedures commonly used with monolingual English speakers are inappropriate and at times invalid when applied to linguistically diverse populations. The lack of reliable and valid screening tools puts linguistically diverse students at risk for underidentification or overidentification of delay and disorder (Winter, 2001). Early intervention programs are in need of a screening tool that can be used to identify linguistically diverse preschool age children with speech disorders that is quick, easy to use, reliable and valid. This study aims to examine the validity of parent report as a method of screening the speech skills of linguistically diverse preschool age children.

Literature Review

Importance of Assessment

In 2001, 91% of SLPs working in the public schools reported having linguistically diverse students on their caseloads (Roseberry-McKibbin, Brice, & O'Hanlon, 2005). As the number of linguistically diverse children in schools across the nation continues to grow, the need for accurate assessment methods becomes increasingly important. Currently, school-based SLPs report difficulty assessing linguistically diverse students due to a number of factors, including the inability to speak the student's language, lack of reliable and valid assessment instruments, and the lack of access to interpreters or other professionals who speak the student's language (Roseberry-McKibbin, Brice, & O'Hanlon, 2005). There is no reason to believe that children who speak a language other than English are more at risk for developing speech and language impairments; therefore, overrepresentation or underrepresentation of linguistically diverse children in speech therapy indicates inadequacies in identification and assessment processes (Winter, 2001).

Testing Problems

There are a number of factors that make assessing articulation and phonology in Spanish-speaking children a challenging task. The reliability and validity of standardized assessment instruments designed to measure articulation and phonology in Spanish speakers tends to be poor (Goldstein, 2001; Schiff-Myers et al., 1994; Roseberry-

McKibbin, 1994). Many assessments do not report normative data (Kayser, 1995). Among those that do, some were standardized on monolingual English speaking children, and then translated into Spanish (Kayser, 1995; Schiff-Myers et al., 1994). Others were standardized on monolingual Spanish speaking children from Spain, Mexico, and Puerto Rico, and consequently, standard scores cannot be reported for children who learned Spanish in a different country, or speak a different dialect (Goldstein, 2001; Roseberry-McKibbin, 1994).

A wide variety of Spanish dialects exists in the U.S., making it difficult to design and standardize Spanish language assessment tools for all children in the U.S. school system. As a result, relatively few assessments of Spanish articulation and phonology have been standardized and published (Kayser, 1995). Given the paucity of standardized assessment tools, assessments are often biased due to a mismatch between the child being tested, and the standardization sample (Roseberry-McKibbin, 1994; Kayser, 1995).

Informal assessment measures such as language sampling analysis provide more information about a child's speech and language than published measures. However given the lack of normative data on typical monolingual Spanish and on bilingual speech and language development, informal assessment measures still do not provide enough information for SLPs to be able to adequately distinguish difference from disorder in this population (Schiff-Meyers et al., 1994). Given the time consuming nature of informal assessment procedures, as well as the lack of developmental

information needed to analyze the information they yield, a parent report measure capable of gathering the same or similar information would be a valuable assessment tool.

Information regarding appropriate assessment procedures is limited in comparison to the amount of phonological assessment information available for monolingual English speakers. Most SLPs receive little or no training on how to assess linguistically diverse children, and very few SLPs speak Spanish proficiently enough to be able to assess Spanish speaking children in that language (Roseberry-McKibbin, O'Hanlon, & Brice, 2004; Shewan & Malm 1989). In addition, SLPs cannot rely on the services of interpreters as issues of cost, training, and availability often limit or prohibit interpretation (Roseberry-McKibbin, Brice, & O'Hanlon, 2005).

Spanish Phonology

In contrast to the amount of information that exists describing phonological development in monolingual English speaking children, there is a paucity of developmental data for typical Spanish phonological development (Goldstein, 1995). Most studies of Spanish phonological development examine Mexican-American dialect in a small number of children. Small sample sizes as well as the existence of a wide variety of dialectal differences limit the usefulness of existing studies of typical Spanish phonological development. This lack of developmental data makes it difficult for SLPs to diagnose disorder in this population.

Standard Spanish

In examining the consonants and vowels of Spanish, many researchers choose to examine the phonemes of standard Spanish. Standard Spanish is a version of Spanish devoid of dialectal variation, which is commonly taught in the American educational system (Goldstein & Iglesias, 1996). Standard Spanish is composed of five vowels /a, e, i, o, u/, voiceless unaspirated stops /p, t, k/, voiced stops /b, d, g/, voiceless fricatives /f, x, s/, the affricate /tʃ/, glides /w, j/, the lateral /l/, the tap /ɾ/ and trill /r/, as well as the nasals /m, n, ŋ/. The voiced stops /b, d, g/, are often replaced by their fricative, allophonic equivalents /β, ð, ɣ/, and /x/ is often replaced by /h/. (Goldstein & Iglesias, 1996; Kayser, 1995). The use of standard Spanish provides a common understanding that facilitates the discussion of dialectal variations (Kayser, 1995).

Spanish Dialects

It is important to consider dialect in phonological analyses. Failure to recognize dialectal features as such may result in misdiagnosis, including inaccurate severity ratings, and inappropriate and/or unnecessary treatment (Goldstein & Iglesias, 2001). While English dialectal differences tend to affect vowels, differences in Spanish dialects often affect consonant sound classes, especially fricatives, liquids, glides, and nasals at the segmental and utterance level (Goldstein & Iglesias, 2001; Kayser, 1995). Unfortunately, very little descriptive data exist outlining specific features of Spanish

dialects commonly spoken in the United States. In addition, features of the English language may affect Spanish, further complicating the picture (Goldstein, 2001). Nevertheless, dialect must be taken into consideration when assessing spontaneous speech samples as failure to consider dialect may result in an inaccurate severity rating and/or misdiagnosis (Yavas & Goldstein, 1998).

The two major Spanish dialects spoken in the United States are Caribbean (Puerto Rican and Cuban), and Southwestern United States (Mexican and Mexican-American) (Goldstein & Iglesias, 1996; Kayser, 1995). Many features of Caribbean Spanish could easily be mistaken for phonological errors by SLPs only familiar with standard Spanish. For example, word-final and syllable-final /s/ is deleted by many speakers of Puerto Rican Spanish (Goldstein & Iglesias, 1996). In addition, /d/ may be deleted in the medial position, /tʃ/ may be replaced by /ʃ/ in the medial position, and /ɲ/ may be replaced by /ɲ/ in the final position of words (Goldstein, 2001). Speakers of Caribbean dialects may also substitute /r/ with /l/ in the medial position of words (Goldstein, 2001).

Southwestern United States dialect could also be easily mistaken for disordered Spanish by SLPs who are not familiar with its features. The bilabial /b/ is often replaced with /v/ in this dialect (Goldstein, 2001). In addition, /k,g/ may be deleted in the medial position of words, and /s/ may be deleted in the final position (Goldstein, 2001).

Spanish Phonological Development

Existing literature in the area of Spanish phonological development focuses on the order of acquisition of Spanish phonemes, as well as the use of phonological error patterns. Studies of phonological development in Spanish speaking children from Mexico, Puerto Rico, Venezuela, and the United States, reveal that most Spanish phonemes are accurately produced by 4-years of age (Acevedo, 1989; Goldstein, 2001; Jimenez, 1987; Linares, 1981). Researchers agree that the last Spanish phonemes acquired are /j, l, r, r, s / and /tʃ/ (Acevedo, 1989; Goldstein, 2001; Jimenez, 1987; Linares, 1981). By the time children are 4-years-old, they should be accurately producing more than half of the Spanish phonemes, as well as two syllable words (Goldstein, 2001; Jimenez, 1987).

As is the case with English speaking children, younger Spanish speaking children use more error patterns than older children (Jimenez, 1987). Common error patterns in Spanish speaking 4- year-olds include: cluster reduction, final consonant deletion, and unstressed syllable deletion (Goldstein & Washington, 2001; Goldstein & Iglesias, 1996; Yavas & Goldstein, 1998).

'Best Practices' in Assessment

Given the lack of reliability and validity of formal, published assessment instruments designed to measure Spanish articulation and phonology, information derived from standardized assessment tools should be used cautiously. In cases where

a child or a population of children are not represented in the standardization sample, standardized assessment tools should be used informally, and should be combined with other nonstandardized measures of phonology such as a spontaneous speech sample (Goldstein, 2001; Kayser, 1995; Yavas & Goldstein, 1998). As is the case when assessing monolingual English speakers, a thorough assessment of Spanish speakers should include: a case history, a spontaneous speech sample, an oral-peripheral examination, and a hearing screening. In addition, the child's dialect must be taken into consideration in order to ensure accurate assessment and diagnosis (Yavas & Goldstein, 1998).

Working with an interpreter

In cases where the SLP does not speak the home language of the child and his/her family, he/she will need to assess the child with the help of an interpreter. If possible, the interpreter should be a native speaker of the child's home language, and should also be familiar with the child's culture. The interpreter should be familiar with ethnographic interviewing techniques, professional ethics and terminology, as well as confidentiality issues. Interpreters should also be trained in basic assessment and intervention techniques (ASHA, 2004).

Phonological Analyses

Ideally, a spontaneous speech sample is analyzed, and yields a description of the child's phonological system that includes independent and relational analysis (Goldstein, 2001). Spontaneous speech samples and phonological analysis should be conducted in the child's native language (Goldstein, 2001). If the correct adult dialect target is used, these may be the best measures of speech development in populations for whom no standardized assessments exist. However, analyzing spontaneous speech samples conducted in the child's native language can be a lengthy and difficult process requiring resources that are often unavailable.

Independent analysis describes the child's speech productions regardless of whether or not the productions resemble adult targets. An inventory of the child's consonant productions is organized according to place of articulation, manner of articulation, and voicing. Consonants, consonant clusters, and vowels are also organized according to their positions within words or syllables (initial, medial, final). In addition, phonotactic information is examined according to the number of syllables per word, as well as word shape (Goldstein, 2001).

In the relational analysis, the child's productions are compared to adult target productions (Goldstein, 2001). Relational analysis provides the clinician with information regarding error patterns, substitutions, omissions, additions, and their position of occurrence within words or syllables (Goldstein, 2001). Errors in word shape are also documented (Yavas & Goldstein, 1998). The percentage of occurrence of each error

pattern can be calculated allowing the clinician to compare the child's use of error patterns to developmental norms. Commonly occurring error patterns have already been discussed. In addition, the percent of consonants correct (PCC) can be calculated by dividing the number of correctly produced consonants by the total number of consonants produced and multiplying by 100. The resulting percentage is commonly used as a measure of speech intelligibility, and phonological development (Shriberg, Austin, Lewis, McSweeney & Wilson, 1997).

In ideal assessment situations, independent and relational analyses yield the data that are necessary for diagnosis and treatment. However, when the child's language differs from that of the speech language pathologist, and trained interpreters are not readily available, it may not be possible to gather and analyze a single word or spontaneous speech sample (Roseberry-McKibbin, O'Hanlon, & Brice, 2004). Even in cases where an interpreter is available to gather a spontaneous speech sample, analyzing the sample is time consuming, and therefore not a feasible option for many SLPs. In these cases, it would be useful to know if it is possible to gather similar information with the use of a parent report protocol. Information provided by parents may serve as a screening tool that could help identify children who are in need of a more thorough speech assessment.

Parent Report

Parent reports have been shown to be valid and reliable sources of information on children's communicative abilities (Dale, 1991; Girolametto, 1997; Thal, O'Hanlon, Clemmons, & LaShon, 1999; Thal, Jackson-Maldonado, & Acosta 2000; Rescorla & Alley, 2001; Restrepo, 1998). Vocabulary, syntax, and language development in both English and Spanish speaking toddlers and preschoolers have been validly measured using parent report surveys and protocols (Dale, 1991; Thal et al 1999; Thal, Jackson-Maldonado, & Acosta 2000; Rescorla & Alley, 2001). The MacArthur Communicative Developmental Inventory is an example of a parent report measure which is commonly used to assess communicative development in preschool children. The Spanish version of the MacArthur Communicative Developmental Inventory; Inventario del Desarrollo de Habilidades Comunicativas, has also been shown to be valid, and is widely used (Thal, Jackson-Maldonado, & Acosta, 2000).

Studies of parental judgments of children's speech skills are rare, however Hadley and Rice (1993), designed a parent report protocol aimed at assessing the speech and language of preschool children. In a study involving 34 participants, they found a high degree of correlation between the Goldman-Fristoe Test of Articulation, parents' judgments of their children's articulation skills, and the results of informal observation of the same skills by an SLP (Hadley & Rice, 1993).

In the case of linguistically diverse children, parent reports are an important supplement to published assessments tools which are often biased. Restrepo (1998),

used a parent report protocol to identify language impairment in Spanish speaking 5 to 7-year-old children. Restrepo's (1998) findings confirm previous studies validating the use of parent reports as measures of children's linguistic competence (Dale, 1991; Thal et al 1999; Thal, Jackson-Maldonado, & Acosta 2000; Rescorla & Alley, 2001).

However, apart from parent report tools designed to measure speech and language in toddlers, no research has been conducted on the use of parent report to identify preschool age children with speech disorders. In many cases, a valid screening tool that could be used to identify non-English speakers with speech disorders could eliminate unnecessary, and time consuming in depth assessments.

Research Hypothesis

In summary, parent report protocols have been shown to be valid measures of speech and language in young children, as well as language disorder in linguistically diverse children ages 5 to 7-years. Research examining the use of parent report protocols to identify speech disorders in preschool age children is extremely rare. Given the dearth of valid screening and assessment tools for linguistically diverse students, a parent report protocol capable of identifying linguistically diverse students with potential speech disorders could be a valuable time saving tool for school based SLPs. To examine the relationship between parent report and the phonological skills of non-English speaking preschool age children, independent and relational analyses of single word speech samples were compared to parent questionnaire responses.

I hypothesized the result of this comparison would reveal parents are sensitive judges of their children's speech skills. I expected a positive correlation between accuracy of production in single word speech samples and parent questionnaire responses, at a level above that of chance. I expected the correlation would not be strong enough to justify the use of parent report protocols as the sole measure of preschoolers' speech skills. However, a moderately strong positive correlation could serve to justify the use of parent report as a screening tool of preschoolers' speech.

Methods

Participants

A group of 24 Spanish speaking children enrolled in two Spanish only classrooms at Mount Hood Community College Head Start Program participated in this study. The children are from Spanish home environments, and are in their first or second year of preschool. The children ranged in age from 3:0 to 4:11 years in the fall of 2004. A background survey was used to determine children's home language, as well as gather information about developmental milestones, incidence of otitis media, and communicative partners (see Appendices A and B)¹. The background survey information was collected in the fall of 2004 as part of a larger study investigating speech development, conducted by Christina Gildersleeve-Neumann, Ph.D., Department of Speech and Hearing Sciences, Portland State University.

Recruiting of Participants

Faculty and staff at Mount Hood Community College Head Start Program have created two Spanish only head start classrooms with the support of the Multnomah Educational Service District (MESD). The program is designed to provide educational services for children of families employed in seasonal labor. A letter explaining the study was sent home to all parents of children in the Spanish classrooms, at the beginning of the academic school year (see Appendices C and D). In addition, Portland State University Speech and Hearing Sciences faculty members and graduate students

¹ All appendices are shown in their original format and their English translation.

explained the study (in both English and Spanish) to groups of parents at two parent meetings in November and December, 2004. Interested parents signed consent forms indicating their willingness to permit their children to participate in the study (see Appendix C and D).

Materials

Background surveys were given to participant families by each child's individual classroom teacher (see Appendix A and B). The surveys, and all other documents pertaining to the study were available in both English and Spanish versions. Background surveys were used to gather information about participants' general developmental history, family structure, and language background. In addition, background surveys included ten questions based on existing questionnaires (Restrepo, 1998) designed to gather information about possible speech delay and/or disorder (see Appendix E and F). Questions pertaining to language background and possible speech disorder were in a Likert scale format in order to allow comparison between responses. Gift certificates in the amount of \$5 were sent home with the background surveys, as a token of appreciation for families who participated in the study. Parents were encouraged to return the surveys to a faculty member or graduate student via their child's classroom teacher. In cases where the surveys were not returned, parents were contacted by phone and the information was gathered through a telephone interview.

Surveys were administered in Spanish, or English, the parents' dominant home language.

A list of 115 Spanish words (see Appendix G), was developed from the Mexican-Spanish version of the Communicative Development Inventory (Jackson-Maldonado et al, 2003), as well as The Usborne Book of Everyday Words in Spanish (Treays, Needham, Miles & Seay, 1999). Words in the list encompass all Spanish phonemes in multiple positions, as well as a wide variety of word shapes. Both monosyllabic and multisyllabic (up to 4 syllables) words were included. Culturally appropriate color pictures selected from Boardmaker software were used to elicit each of the 115 single words. The picture stimuli were culturally appropriate, and suitable for preschool age children. The stimuli were printed on white paper measuring 4.24 by 5.5 inches, and were laminated. Each card provided a clear stimulus for the target production.

Single word articulation samples were video taped and audio recorded using digital technology. Two Sony DCR-PC101 video cameras with external microphones, and two Tascam DA-PI digital audio tape recorders were used.

Procedures

A 115 item single word articulation test was administered using picture stimuli. Assessments were conducted during school hours in a quiet area outside of individual classrooms at Knott Center Head Start, within a 3 week period of time in December, 2004. Elicitation of all target word productions was completed within 15 minutes.

Participants were assessed in Spanish, by fluent Spanish speaking faculty and graduate students from the Portland State University Speech and Hearing Sciences department. Stimulus items were presented one at a time, and participants were asked to identify the item or action depicted. When participants were unable or unwilling to identify a stimulus item, it was elicited using delayed imitation. In cases where delayed imitation was unsuccessful, direct imitation was used. Items that could not be elicited were skipped. Examiners made note of items that were elicited using delayed or direct imitation.

Examiners did not transcribe participants' productions during data collection. The desire to keep testing time as short as possible, and concerns about differing transcription skills among examiners led to the decision to transcribe from digital audio and video recordings posttesting.

Immediately after testing each participant, examiners completed a short checklist outlining information about distractions or interruptions, the participants' intelligibility, response language (whether the participant responded to any of the stimulus items in English), and atypical characteristics that may indicate the presence of a disorder (see Appendix H).

Data Analysis

Single words elicited during the articulation test were narrowly transcribed from audio and video recordings by a Spanish speaking graduate student. Careful consideration was given to the transcription of vowels, because vowel errors have a

negative impact on intelligibility, and are often indicative of severe disorder (Pollock, 2003). Interrater reliability was calculated after a Spanish speaking faculty member transcribes a selection of the single word articulation tests. Interrater reliability was found to be 95%.

Narrow transcriptions were entered into Logical International Phonetic Program (LIPP) software for phonetic analysis (Oller & Delgado, 2000). Comparison was made to adult target transcription based on Spanish spoken in the Mexican American dialect. Phonetic analysis determined percent consonants correct (PCC), and percent vowels correct (PVC). Percent consonants correct (PCC) was calculated by dividing the number of incorrectly produced consonants by the total number of consonants in the sample and multiplying by 100. PVC was calculated by dividing the number of incorrectly produced vowels by the total number of vowels in the sample and multiplying by 100.

Statistical Analysis

Individual responses to Likert scale questions on the parent report questionnaires were assigned a number 1-5. Responses to each question were compared to PVC and PCC data, using Pearson correlation. A level of significance of $p = .05$ was adopted.

Threats to validity

General threats to the validity of this study include small sample size. Threats to internal validity include participants' performance during the single word articulation test, as well as parent responses on background surveys. It is possible that parents who feel their children's speech and language skills fall within the typical to advanced range answered survey questions more honestly than parents who feel their children are struggling in the areas of speech and language. Also, three of the children who participated in the current study had been previously diagnosed with speech and/or language disorders, and were receiving speech treatment services as outlined by Individualized Family Service Plans (IFSP). It is possible that parents whose children had been previously diagnosed responded to survey questions based on the diagnosis made by their child's SLP, rather than their own judgment.

It should be noted that the correlation in the current study examined the relationship between Likert-scaled parent report questions which are ordinal variables, and the percentage of vowels and consonants produced correctly by participants, which are ratio level variables. It is common to treat Likert-scaled nominal variables as continuous for ease of comparison with other continuous variables (Babbie, 1998). Likert-scaled parent report responses were treated as continuous variables in this study.

Results

This study examined the relationship between the accuracy of preschool children's production of single words and parents' responses to survey questions regarding their children's speech skills. Both typically developing children, and three children with disorders were included in the analyses.

Overall Analysis Results

Table 1 reports Pearson correlation results between parent responses to survey questions, and the accuracy of participants' vowels and consonants in single word utterances. The results indicate a range in the strength of the relationships between questions and speech productions. The mean of the percentages of vowels correct is 92.1%, and the range is 65.1% to 98.5%. For vowels, seven of ten questions showed a statistically significant correlation to phoneme accuracy. Question 3 asked if other people find the child's pronunciation difficult to understand. For PVC, it yielded a correlation of $+0.84$ with participants' phoneme accuracy. Similarly, question 10 asks if other people think the child has speech problems, and at $+0.69$, it yielded the second strongest correlation with single word articulation task results. Questions 5 and 6 ask parents if their child has difficulty producing certain sounds, and if he/she leaves sounds out when speaking. These questions showed the weakest correlation to phoneme accuracy.

Table 1. Pearson correlation between parent questionnaire responses and percentage of vowels (PVC) and consonants (PCC) produced correctly with corresponding r^2 values.

Survey Questions	PVC	r^2	PCC	r^2	Mean	Range
1. Is your child's pronunciation difficult to understand?	+ .40 (pos. weak)	16%	+ .30 (pos. weak)	9%	4.0	1-5
2. In comparison to other children his/her age, do you think your child is difficult to understand?	+ .61** (pos. moderate)	37%	+ .60** (pos. moderate)	36%	4.2	2-5
3. Do other people think your child is difficult to understand?	+ .84** (pos. strong)	71%	+ .81** (pos. strong)	66%	4.6	2-5
4. Does your child have difficulty pronouncing words?	+ .68** (pos. strong)	46%	+ .57** (pos. moderate)	32%	3.9	1-5
5. Does your child have problems producing certain sounds?	+ .39 (pos. weak)	15%	+ .44 (pos. moderate)	19%	4.3	3-5
6. Does your child leave out sounds when he/she speaks? For example, saying "ca" for "cat", or "tar" for "star"?	+ .39 (pos. weak)	15%	+ .38 (pos. weak)	14%	3.9	2-5
7. Does your child change sounds when he/she speaks? For example, saying "too" for "shoe" or "wun" for "run"?	+ .43* (pos. moderate)	18%	+ .48* (pos. moderate)	23%	4.2	2-5
8. Is your child frustrated when he/she speaks?	+ .65** (pos. strong)	42%	+ .75** (pos. strong)	56%	4.5	2-5
9. In comparison to other children his/her age, do you think your child has speech problems?	+ .60** (pos. moderate)	36%	+ .55** (pos. moderate)	30%	4.2	1-5
10. Do other people think your child has speech problems?	+ .69** (pos. strong)	48%	+ .78** (pos. strong)	61%	4.5	1-5

**Correlation is significant at the .01 level

* Correlation is significant at the .05 level

For consonants, seven of ten questions yielded statistically significant correlations to phoneme accuracy. The mean of the percentages of consonants correct is 79.8% and the range is 33.6% to 93.6%. Once again, question 3 showed the strongest correlation at +.81, and question 10 yielded the second strongest relationship at +.78. Question 1 asked parents to indicate how difficult it is to understand their child's

pronunciation, and it yielded the weakest relationship with participants' phoneme accuracy.

When parent responses to all 10 questions were summed and correlated to the percentage of vowels produced correctly (PVC), and the percentage of consonants produced correctly (PCC) by participants, statistically significant relationships of $r = .70$ for PVC ($p < .01$), and $r = .69$ for PCC ($p < .01$) resulted. When the three questions without statistically significant correlations were excluded from the analysis, the sum of the seven remaining questions yielded strong positive correlations of $r = .73$ for PVC ($p < .01$), and $r = .74$ for PCC ($p < .01$).

Age Specific Results

To determine if correlation strengths differed by age, subgroups of participants consisting of seven 3-year olds, thirteen 4-year olds, and four 5-year olds were analyzed. Notable differences in the strength of the correlations resulted when participants were grouped in this manner.

Table 2 outlines correlations between speech productions and parent report data for 3-year old participants. The mean of the PVC for 3-year old participants is 89.3% and the range is 65.1% to 96%. The mean of the PCC for 3-year olds is 76.3% and the range is 33.6% to 89.8%. The results yielded stronger relationships for six of ten questions in comparison to the correlations that included all participants. Once again, questions 3 and 10 produced the strongest correlation to single word articulation test

results. In fact, the strength of both relationships increased in the 3-year-old group. The strength of the relationship between survey questions and speech productions increased significantly for question 10 in the 3-year old group, where $r = .99$ ($p < .01$) for the percent of phonemes produced correctly (PCC). Questions 3 and 10 account for 88 and 97% of the variance of single word articulation results for 3-year-olds.

Table 2. Pearson correlation between parent questionnaire responses and percentage of vowels (PVC) and consonants (PCC) produced correctly with corresponding r^2 values for 3-year-old participants. (N =8)

Survey Questions	PVC	r^2	PCC	r^2	Mean	Range
1. Is your child's pronunciation difficult to understand?	+ .35 (pos. weak)	12%	+ .31 (pos. weak)	10%	3.6	3-5
2. In comparison to other children his/her age, do you think your child is difficult to understand?	+ .71 (pos. strong)	50%	+ .67 (pos. strong)	45%	3.9	2-5
3. Do other people think your child is difficult to understand?	+ .96** (pos. strong)	92%	+ .92** (pos. strong)	85%	4.5	2-5
4. Does your child have difficulty pronouncing words?	+ .79* (pos. strong)	62%	+ .73 (pos. strong)	53%	3.6	1-5
5. Does your child have problems producing certain sounds?	+ .62 (pos. moderate)	38%	+ .55 (pos. moderate)	30%	4.3	2-5
6. Does your child leave out sounds when he/she speaks? For example, saying "ca" for "cat", or "tar" for "star"?	+ .40 (pos. moderate)	16%	+ .33 (pos. weak)	11%	3.8	2-5
7. Does your child change sounds when he/she speaks? For example, saying "'too" for "shoe" or "wun" for "run"?	+ .84* (pos. strong)	71%	+ .79* (pos. strong)	62%	4.4	2-5
8. Is your child frustrated when he/she speaks?	+ .87* (pos. strong)	76%	+ .89** (pos. strong)	79%	4.3	2-5
9. In comparison to other children his/her age, do you think your child has speech problems?	+ .69 (pos. strong)	48%	+ .59 (pos. moderate)	35%	3.9	1-5
10. Do other people think your child has speech problems?	+ .99** (pos. strong)	97%	+ .98** (pos. strong)	96%	4.5	1-5

**Correlation is significant at the .01 level

* Correlation is significant at the .05 level

An examination of the correlation between the two sets of data for 4-year old participants also revealed some intriguing differences. Table 3 outlines these differences. The mean of the PVC for 4-year olds is 93.6% and the range is 84.3% to 98.5%. The mean of the PCC for 4-year olds is 81.3% and the range is 69% to 93.6%. The strength of the correlation weakened for nine of ten questions for 4-year olds in comparison to 3-year olds, and the group as a whole. Question 6 is the only question that showed a stronger relationship between speech productions and parent report data for 4-year-olds. Again, questions 3 and 10 produced moderate to strong, statistically significant relationships.

Table 3. Pearson correlation between parent questionnaire responses and percentage of vowels (PVC) and consonants (PCC) produced correctly with corresponding r^2 values, mean, and range for 4-year-old participants. (N=13)

Survey Questions	PVC	r^2	PCC	r^2	Mean	Range
1. Is your child's pronunciation difficult to understand?	.46 (pos. moderate)	21%	.21 (pos. weak)	4%	4.2	1-5
2. In comparison to other children his/her age, do you think your child is difficult to understand?	.63* (pos. moderate)	40%	.54 (pos. moderate)	29%	4.4	3-5
3. Do other people think your child is difficult to understand?	.77** (pos. strong)	59%	.61* (pos. moderate)	37%	4.6	3-5
4. Does your child have difficulty pronouncing words?	.55* (pos. moderate)	30%	.32 (pos. weak)	10%	4.1	3-5
5. Does your child have problems producing certain sounds?	.16 (pos. weak)	3%	.30 (pos. weak)	9%	4.4	3-5
6. Does your child leave out sounds when he/she speaks? For example, saying "ca" for "cat", or "tar" for "star"?	.62* (pos. moderate)	38%	.50 (pos. moderate)	25%	3.9	2-5
7. Does your child change sounds when he/she speaks? For example, saying "too" for "shoe" or "wun" for "run"?	.13 (pos. weak)	2%	.15 (pos. weak)	2%	4.0	2-5
8. Is your child frustrated when he/she speaks?	.42 (pos. moderate)	18%	.58* (pos. moderate)	34%	4.6	3-5
9. In comparison to other children his/her age, do you think your child has speech problems?	.65* (pos. strong)	42%	.44 (pos. moderate)	19%	4.2	2-5
10. Do other people think your child has speech problems?	.65* (pos. strong)	42%	.58* (pos. moderate)	29%	4.4	2-5

**Correlation is significant at the .01 level

* Correlation is significant at the .05 level

The mean of the PVC for 5-year olds is 93% and the range is 91% to 94.4%.

Table 4 outlines these findings. The mean for the PCC for the 5-year old group is 82.3% and the range is 79.8% to 85.6%. As was the case with the 3-year old group, an examination of the strength of the correlation results for 5-year olds revealed relationships that are stronger for nine of ten questions in comparison to the group as a

whole. However, the 5-year old group also yielded negative relationships for eight of ten questions for PVC. The 5-year old group did not yield any statistically significant relationships.

Table 4. Pearson correlation between parent questionnaire responses and percentage of vowels (PVC) and consonants (PCC) produced correctly with corresponding r^2 values, mean, and range for 5-year-old participants. (N = 3)

Survey Questions	PVC	r^2	PCC	r^2	Mean	Range
1. Is your child's pronunciation difficult to understand?	.35 (pos. weak)	12%	.16 (pos. weak)	3%	4.7	4-5
2. In comparison to other children his/her age, do you think your child is difficult to understand?	-.10 (neg. weak)	1%	.66 (pos. strong)	44%	4.3	4-5
3. Do other people think your child is difficult to understand?	-.55 (neg. moderate)	30%	.89 (pos. strong)	79%	5	5-5
4. Does your child have difficulty pronouncing words?	.35 (pos. weak)	12%	.16 (pos. weak)	3%	3.7	3-4
5. Does your child have problems producing certain sounds?	-.32 (neg. weak)	10%	.54 (pos. moderate)	29%	4.3	4-5
6. Does your child leave out sounds when he/she speaks? For example, saying "ca" for "cat", or "tar" for "star"?	-.05 (neg. weak)	>1%	.41 (pos. moderate)	17%	4.0	3-5
7. Does your child change sounds when he/she speaks? For example, saying "too" for "shoe" or "wun" for "run"?	-.25 (neg. weak)	6%	.69 (pos. strong)	48%	4.7	4-5
8. Is your child frustrated when he/she speaks?	-.55 (neg. moderate)	30%	.89 (pos. strong)	79%	5	5-5
9. In comparison to other children his/her age, do you think your child has speech problems?	-.55 (neg. moderate)	30%	.89 (pos. strong)	79%	5	5-5
10. Do other people think your child has speech problems?	-.55 (neg. moderate)	30%	.89 (pos. strong)	79%	5	5-5

Discussion

The results of this study indicate parents of preschool children are able to reliably report valuable information regarding their children's speech skills. Statistically significant correlations between the information reported by parents and articulation test results gathered by speech professionals indicate parent report questionnaires might be used to screen and identify speech disorders in preschool children. These results are consistent with similar studies designed to examine the validity of parent report measures of speech and language skills in children (Dale, 1991; Girolametto, 1997; Thal et al 1999; Thal, Jackson-Maldonado, & Acosta 2000; Rescorla & Alley, 2001; Restrepo, 1998).

Both typically developing and disordered children were included in the current study, and results suggest the parent questionnaire is a sensitive screening tool. Parents of children with disorders indicated their concerns on the report, which corresponded to articulation test findings and yielded a positive screening result. The findings also indicate the screening tool is specific, as parents of typically developing children indicated their lack of concern regarding their children's speech. These negative screening results were in accordance with articulation test findings.

The questionnaire as a whole accounts for 51% of the variance of single word articulation test results. That is, a speech language pathologist's ability to predict a student's performance on a single word articulation assessment is improved by 51% over no prediction ability. The questionnaire's ability to account for the variance of

speech accuracy improves to 57% when it is shortened to include only the seven questions that produced statistically significant correlations. Evidence from similar studies suggests that when the parent survey is combined with other diagnostic measures, such as family history, its prediction ability will increase (Restrepo, 1998). The parent report makes it possible for school-based speech language pathologists to gather valuable diagnostic information about the speech of linguistically diverse students using a screening method that is quick, easy to use, and doesn't require a lot of time. In addition, the parent report questionnaire could be translated into students' home language(s), and sent home to parents along with other required paperwork, allowing speech screenings to be completed via correspondence. Speech screenings conducted in this manner are cost effective because they eliminate the need for translation services.

Despite the questionnaire's strengths as a whole, it is interesting to examine how individual question content affected the strength of correlation results. Questions that asked parents to report the emotions and opinions of others consistently yielded the strongest relationship to articulation test data. For example, the two questions that yielded the strongest correlation to articulation test data across all age groups were question 3, "Do other people think your child is difficult to understand?" and question 10, "Do other people think your child has speech problems?" Both questions ask parents to report others' impressions of their children's speech. Similarly, the question that yielded the third strongest relationship with articulation test data was question 8 which asks "Is

your child frustrated when he/she speaks?" All three questions require parents to report something other than their own opinions, allowing them to impart information that may be more objective than their own personal experiences with their children's speech.

In contrast, the question that consistently yielded the weakest relationship with articulation test data asked parents if they found their child's speech difficult to understand. These findings suggest parents are able to understand their children's speech even in the presence of a speech disorder. The results suggest parents' familiarity with their children's speech error patterns allows them to comprehend their children's speech even if it is unintelligible to other, less familiar listeners.

The perceptions, emotions, and opinions of parents' friends and other family members appear to be the key to identifying a child's speech difficulties when using a parent report as a screening tool. Parents' familiarity with their children makes them unreliable reporters of their children's speech skills. However parents are still able to report valuable information when they are asked to relate the opinions of others.

The perceptions and emotions of friends and family members seem to be especially important for the identification of 3-year olds with speech disorders. The strength of the relationships between speech productions and parent report data increased for nine of ten questions for 3-year olds compared to the group as a whole, however questions 3 and 10 still yielded the strongest relationships. For example, question 10 on the parent report survey asks parents if other people think their child has speech problems, and it is able to account for 97% of the variance of articulation test

results. This single survey question is highly predictive of articulation test results for 3-year old children.

While the strength of the relationships were slightly weaker in the Pearson correlation results for 4-year olds, the questions that ask parents to report the perceptions of others (questions 3 and 10), still yielded the strongest relationships, and still accounted for 47% and 40% of the variance of articulations test results. The difference in the strength of the correlations may be due to the larger sample size. The 4-year old group included two participants with previously diagnosed speech disorders, and eleven typically developing participants. While parents of the participants with speech disorders indicated their concern in their answers to all survey questions, parents of typically developing participants also indicated concern in their answers to some survey questions. Overall, the surveys of parents of typically developing participants who indicated concern were still very different from the surveys of parents whose children presented with speech disorders. The average of all ten Likert-scaled survey answers for typically developing 4-year olds whose parents indicated concern was 3.6, while the average for 4-year olds with disorders was 3. This discrepancy between potential false positive screenings and screenings that accurately yield positive results should be large enough to preserve the specificity of the survey. However this hypothesis should be tested with a larger sample size.

In the 5-year old age group, nine negative relationships resulted when the percent of vowels correct (PVC) was correlated to parent report responses. However

the analyses also yielded strong positive correlations between parent report responses and the percent of consonants correct (PCC). Negative relationships in the area of vowel productions appears to be an artifact of the small sample size of this group. The average of the PVC for 5-year olds was comparable to the average of the group as a whole, while the parent report scores for 5-year olds were slightly lower. Negative correlations did not result in the PCC correlations because vowel productions are generally more accurate than consonant productions, which creates a larger disparity between PVC and parent report data.

The results for 5-year olds also showed that in addition to questions 3 and 10, questions 8 and 9 also resulted in strong positive correlations for PCC. These results are consistent with the results for 3 and 4-year olds. The consistency across age groups suggests the best way to identify preschoolers who are in need of a more in-depth speech assessment is to ask parents to report the opinions and impressions of “others”.

According to a recent study administered by the U.S. Department of Education’s Office of English Language Acquisition, the percentage of linguistically diverse students enrolled in public schools represents approximately 9.6% of total school enrollment, and is rapidly increasing in most states (OELA, 2002). However, a number of studies indicate that speech language pathologists do not feel comfortable assessing and treating linguistically diverse students (Roseberry-McKibbin, Brice, & O’Hanlon, 2005; Kritikos 2003; Kohnert et al., 2003). According to 1,842 SLPs surveyed in two separate studies, the two most commonly perceived problems encountered when providing

assessment and treatment for linguistically diverse students are 1) the inability to speak the student's language, and 2) the lack of unbiased assessment materials (Roseberry-McKibbin, Brice, & O'Hanlon, 2005; Kohnert et al., 2003). Parent report surveys that have been translated into students' home languages allow school-based SLPs to identify linguistically diverse students who are in need of more in-depth evaluations while addressing both of these areas of need. The parent report questionnaire provides valuable diagnostic information without necessitating costly interpretation services. It allows monolingual English speaking SLPs to assess the communicative abilities of children on their caseloads in their native language as mandated by public law 94-142 (Turnbull & Turnbull, 2000).

The use of parent reports also allows school systems to address the need for assessment materials that are unbiased. Parent report protocols are inherently less biased because they draw information from students' natural language environments, rather than from standardization samples which are often compiled in separate geographic regions and/or from differing dialects. Parent report surveys compare children to peers in their own community, making use of parents' knowledge of 'local norms.'

Limitations of the study

As mentioned previously, small sample size limits the validity of this study. Results for age groups (3, 4 and 5-year olds) should be interpreted with caution as they

divide a small group of participants into even smaller subgroups. In addition, parents of three children who had been diagnosed with speech and/or language disorders before the study may have reported the impressions of their child's SLP in the parent report survey, rather than their own impressions.

Conclusion

Speech disorders affect the educational experiences of a large percentage of preschool and school age children. Assessing the speech of linguistically diverse students is a challenge for speech language pathologists because of the general lack of interpreters and nonbiased assessment tools. Using parent report surveys to screen the speech skills of linguistically diverse students is a solution that addresses many of the challenges speech language pathologists face in providing services for diverse student populations.

In order to improve the quality of services provided to English language learners in public schools nationwide, more research is needed to examine the validity of parent report as a measure of speech disorders in linguistically diverse children. Future studies should include a larger number of participants with a wider age range, who are from a variety of language backgrounds. Future research should also focus on the clinical significance of the information parents provide when asked to report the perceptions, concerns, and opinions of friends and family members in their community who regularly come into contact with their children.

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Appendix A
CUESTIONARIO SOBRE EL DESARROLLO DEL NIÑO

Estudio sobre el desarrollo del lenguaje en niños
que hablan sólo inglés o son bilingües

Por favor, llene este cuestionario y devuélvalo al maestro de su hijo/a en el sobre que adjuntamos. Si prefiere, podemos llenar este cuestionario por teléfono. Le llamaremos en pocos días para ver si tiene dudas o preguntas. Muchas gracias por su colaboración.

Nombre de su Hijo/a: _____

Su Nombre: _____ Relación con el niño: _____

Sección 1. EL DESARROLLO DE SU HIJO.

Estas preguntas nos ayudarán a comprender el desarrollo de su niño. Si tiene dudas sobre cualquier pregunta, no tiene que contestar la pregunta o puede pedir que la clarifiquemos.

1. ¿Cuál es la fecha de nacimiento de su hijo/hija?
2. ¿Dónde nació su hijo/a?
3. ¿Dónde nacieron los padres del niño?
4. ¿Qué idioma(s) hablan los padres del niño?
5. ¿Qué edad tenía su bebé cuando comenzó a balbucear? (por ejemplo, "ba ba ba", "pa pa ba")
6. ¿Qué edad tenía su hijo/hija cuando dijo las **tres** primeras palabras que usted pudo distinguir?
¿Cuáles fueron estas palabras?
1. ¿Qué edad tenía su hijo/hija cuando comenzó a decir oraciones de 2 ó 3 palabras de forma regular?
2. ¿Qué edad tenía su hijo/hija cuando comenzó a hablar en oraciones completas, aunque le haya faltado una u otra palabra?
3. ¿Le han hecho a su hijo/hija un examen para ver si oye bien? ¿Cuáles fueron los resultados?
4. ¿Ha recibido su hijo/hija tratamiento por infecciones del oído? ¿Cuántas veces? ¿Cuándo?
5. ¿Ha sufrido su hijo/hija de enfermedades serias o ha sido alguna vez hospitalizado(a)? Por favor, explique.
6. ¿Tiene su hijo/hija alguna condición médica o enfermedad que le haya sido diagnosticada? Por favor, explíquelo.
7. Haga una lista de los miembros de la familia de su hijo/hija. (papá, mamá, hermanos, etc).
8. ¿Cuáles son las personas con las que su hijo/hija pasa la mayor parte del tiempo?
9. ¿Tiene usted alguna preocupación sobre el desarrollo en general de su hijo/hija? ¿Cuáles son estas dudas?

Appendix A

SECCION 2. CUESTIONARIO DEL LENGUAJE. Tenemos algunas preguntas que nos ayudarán a comprender mejor como su hijo/a está aprendiendo a hablar, especialmente con qué frecuencia y con quién su niño/a habla español o inglés. Si no está seguro/a sobre cualquiera de estas preguntas, no la conteste, o pregúntennos y con mucho gusto le ayudaremos. Muchas gracias por su colaboración.

1. ¿Por cuántos años ha estado su hijo/hija expuesto al español (o cualquier otro idioma)?
2. ¿Qué dialecto de español (o cualquier otro idioma) habla su hijo/hija?
3. ¿Qué idioma escucha su hijo/hija hablar en casa? Si es más de un idioma, por favor, indique horas al día que escucha cada idioma.
4. ¿Cuándo comenzó su hijo/hija a escuchar inglés por primera vez?
5. ¿Utiliza su hijo/hija palabras en inglés cuando habla en casa? ¿Con qué frecuencia?
6. ¿Existen otras fuentes donde su hijo/hija está expuesto al inglés? Indique las horas por semana:
 - ___ Televisión
 - ___ Radio
 - ___ Otro (Por favor, describa) _____
 - ___ Otro (Por favor, describa) _____

7. ¿Con quiénes pasa su hijo/hija la mayor parte del tiempo?

Indique a continuación en los espacios

apropiados la cantidad de tiempo que su niño(a) pasa con diferentes personas.

	Menos de 1 hora/d a	1-4 hrs/d a	4-8 hrs/d a	Ms de 8 hrs/da	
					Qu idioma hablan cuando estn con su hijo o hija?

- ___ Madre _____
- ___ Padre _____
- ___ Niñera _____
- ___ Hermanos _____
- ___ Otros _____
- parientes
- ___ Maestros _____
- ___ Amigos _____
- ___ Otro _____

Appendix A

Por preguntas 8 a 15, por favor marque el número apropiado por cada pregunta.

8. ¿Qué tan bien **comprende** su hijo/a el **inglés**? 9. ¿Qué tan bien **comprende** su hijo/a el **español**?
- | | |
|---|---|
| 1 Unas pocas palabras. | 1 Unas pocas palabras. |
| 2 Un poco de lo que le dicen. | 2 Un poco de lo que le dicen. |
| 3 En general comprende lo que le dicen. | 3 En general comprende lo que le dicen. |
| 4 Mucho de lo que le dicen. | 4 Mucho de lo que le dicen. |
| 5 Casi todo de lo que le dicen. | 5 Casi todo de lo que le dicen. |
10. ¿Qué tan bien **habla** su hijo/hija el **inglés**?
- 1 – No puede hablar el idioma, pero sabe algunas palabras.
 - 2 – No puede hablar el idioma, pero sabe algunas palabras y frases.
 - 3 – Puede hablar un poco, pero con muchos errores de gramática y poco vocabulario.
 - 4 – Puede hablar bien, pero con algunos errores de gramática y con una cantidad moderada de vocabulario.
 - 5 – Puede hablar tan bien como cualquier persona nativa del idioma con pocos errores y buen vocabulario.
11. ¿Qué tan bien **habla** su hijo/hija el **español**?
- 1 – No puede hablar el idioma, pero sabe algunas palabras.
 - 2 – No puede hablar el idioma, pero sabe algunas palabras y frases.
 - 3 – Puede hablar un poco, pero con muchos errores de gramática y poco vocabulario.
 - 4 – Puede hablar bien, pero con algunos errores de gramática y con una cantidad moderada de vocabulario.
 - 5 – Puede hablar tan bien como cualquier persona nativa del idioma con pocos errores y buen vocabulario.
12. ¿Con qué frecuencia su hijo/a **habla Inglés**? 13. ¿Con qué frecuencia su hijo/a **habla Español**?
- | | |
|-------------------------------|-------------------------------|
| 1 – Nunca | 1 – Nunca |
| 2 – Un poco | 2 – Un poco |
| 3 – A veces | 3 – A veces |
| 4 – La mayor parte del tiempo | 4 – La mayor parte del tiempo |
| 5 – Todo el tiempo | 5 – Todo el tiempo |
14. ¿Con qué frecuencia su hijo/a **escucha Inglés**? 15. ¿Con qué frecuencia su hijo/a **escucha Español**?
- | | |
|-------------------------------|-------------------------------|
| 1 – Nunca | 1 – Nunca |
| 2 – Un poco | 2 – Un poco |
| 3 – A veces | 3 – A veces |
| 4 – La mayor parte del tiempo | 4 – La mayor parte del tiempo |
| 5 – Todo el tiempo | 5 – Todo el tiempo |

Appendix B

BACKGROUND SURVEY

Study of Language Development in English-Only and Bilingual Children

Please fill this out and return it to me, Christina Gildersleeve-Neumann, through your child's teacher. If you prefer, you can complete these questions with me over the phone. I or one of my students **will call in a few days to see if you have questions. Thank you for your help!**

Child's Name: _____

Your Name: _____ Your Relationship to Child: _____

Section 1. DEVELOPMENT HISTORY.

These questions help us understand your child's development. If you have questions or concerns about a question, please feel free to not answer or to ask for clarification.

What is your child's birthdate?

10. Where was your child born?
11. Where were the child's parents born?
12. What language(s) do the child's parents speak?
13. How old was your child when he or she first babbled (eg., say *bababa* or *dadada*)?
14. How old was your child when he or she first spoke three different words? What were they?
15. How old was your child when he or she started saying 2 and 3 word sentences on a regular basis?
16. How old was your child when she or he first spoke in sentences, even though some of the words in the sentence may have been missing?
17. Has your child ever had his or her hearing checked? What were the results?
18. Has your child been treated for ear infections? If yes, how many times? When were they?
19. Has your child ever had a serious illness or been hospitalized? If yes, please explain.
20. Does your child have any diagnosed medical conditions? If so, please explain.

Who are the members of your child's family? Please note ages of sisters and brothers.

21. Who are the main people with whom your child interacts?
22. Do you have any concerns about your child's general development? If so, what are they?
- 23.

Appendix B

SECTION 2. LANGUAGE SURVEY. The questions below help us understand your child's language development, particularly how often and with whom your child speaks English and other languages. **If your child does not speak Spanish, only answer question 1 of this section and move on to Section 3.** If you have questions or concerns about a particular question, please feel free to not answer, or to ask me for clarification.

1. Does your child speak and hear only English? If no, please complete the questions below. **If yes,** skip to Section 3 of this survey.
2. For how many years has your child been exposed to Spanish (or other language)?
3. Which dialect of Spanish (or other language(s)) does your child speak?
4. What language(s) does your child hear at home? If more than one, give approximate hours/day.
5. When and what was your child's first exposure to English?
6. Does your child use any English words at home? If so, how often?
7. What other exposure does your child have to English? Please list about how many hours in a week for each:

_____ Television
 _____ Radio
 _____ Other (Please describe) _____
 _____ Other (Please describe) _____

8. Whom does your child spend time with in a typical week? Please check the appropriate boxes below to indicate amount of time spent together.

	Less than 1 hr/day	1-4 hrs/day	4-8 hrs/day	More than 8 hrs/day		What languages do they speak when they are around your child?

___ Mother _____
 ___ Father _____
 ___ Babysitter _____
 ___ Siblings _____
 ___ Other _____

relatives

___ Teacher

___ Friends

Appendix B

On questions 9-16, please circle the appropriate number for each question.

9. How well does your child understand **English**? 10. How well does your child understand **Spanish**?

- | | |
|--|--|
| 1 - A few words. | 1 - A few words. |
| 2 - A little of what is said. | 2 - A little of what is said. |
| 3 - Generally what is said. | 3 - Generally what is said. |
| 4 - A lot of what is said. | 4 - A lot of what is said. |
| 5 - Almost all or all of what is said. | 5 - Almost all or all of what is said. |

11. How well does your child speak **English**?

- 1 - Child cannot speak the language but knows a few words.
- 2 - Child cannot speak the language well but knows some words and phrases.
- 3 - Child speaks the language a little but with many grammatical errors and a limited vocabulary.
- 4 - Child speaks the language well but with some grammatical errors and a moderate vocabulary.
- 5 - Child speaks the language like a native English speaker with very few errors and a good vocabulary.

12. How well does your child speak **Spanish**?

- 1 - Child cannot speak the language but knows a few words.
- 2 - Child cannot speak the language well but knows some words and phrases.
- 3 - Child speaks the language a little but with many grammatical errors and a limited vocabulary.
- 4 - Child speaks the language well but with some grammatical errors and a moderate vocabulary.
- 5 - Child speaks the language like a native Spanish speaker with very few errors and a good vocabulary.

13. How often does your child speak **English**? 14. How often does your child speak **Spanish**?

- | | |
|----------------------|----------------------|
| 1 - Never | 1 - Never |
| 2 - A little | 2 - A little |
| 3 - Sometimes | 3 - Sometimes |
| 4 - Most of the time | 4 - Most of the time |
| 5 - All of the time | 5 - All of the time |

15. How often does your child hear **English**? 16. How often does your child hear **Spanish**?

- | | |
|----------------------|----------------------|
| 1 - Never | 1 - Never |
| 2 - A little | 2 - A little |
| 3 - Sometimes | 3 - Sometimes |
| 4 - Most of the time | 4 - Most of the time |
| 5 - All of the time | 5 - All of the time |

Appendix C

Formulario de Consentimiento para los Padres

PARTICIPE EN UN PROYECTO IMPORTANTE:
El desarrollo del lenguaje en niños bilingües

La Dra. Christina Gildersleeve-Neumann, profesora de Ciencias del Habla y Audición, de Portland State University, quiere estudiar como los niños bilingües aprenden hablar dos idiomas. Queremos invitarle a participar por que su hijo o hija es de la edad pre-escolar, habla español o inglés (o ambas lenguas) en la casa, y asiste al programa de Knott Head Start, donde vamos a hacer este estudio.

¿Sí Decido Que Mi Hijo o Hija Participe, Qué Tenemos Que Hacer?

Si deciden participar en este proyecto:

- Ud. llenaría un cuestionario sobre su hijo o hija. Este cuestionario es sobre el desarrollo de su niño, particularmente el desarrollo de la lengua. Ud. puede llenar este formulario, o Christina u otra maestra puede hacerle las preguntas y llenarlo. Esta parte dura aproximadamente 10 minutos.
- Cada 6 meses, su niño va a hablar con Christina (o una maestra que le ayuda) por 15 minutos en inglés y 15 minutos en español. Cada vez, le preguntaremos a su hijo si quiere participar, y su hijo sólomente participará si él o ella nos da permiso. Tendremos estas reuniones en la escuela cada 6 meses, hasta que su hijo o hija cumpla 6 años. Durante la reunión, su hijo verá dibujos y nombrará las figuras en los dibujos en inglés o español. Si su hijo o hija es bilingüe, tendremos dos reuniones cada seis meses: una reunión será en inglés, y la otra reunión será en español. Las reuniones serán grabadas por audio y video para que Christina pueda escribir precisamente la que su hijo ha dicho.
- En septiembre del próximo año, y cada año después, Christina o su asistente le llamarán con preguntas sobre la lengua y el desarrollo de su hijo o hija. Esta llamada durará aproximadamente 5 minutos y es sólo para saber si algo en el desarrollo de su hijo o hija ha cambiado, o para contestar cualquier pregunta que Ud. tenga.
- Ud. no tiene que dar permiso si no quiere. Y si su hijo o hija no quiere participar, no está obligado a hacerlo. Su hijo puede perder unos minutos de clase por este proyecto; Christina trabajará con el maestro o maestra de su niño para escoger una hora apropiadamente y conveniente para hablar con su hijo.
- **Que Recibo Por Participar?**
- El beneficio más grande de este estudio no es directo. El estudio puede aumentar el conocimiento sobre personas bilingües, y la información puede ayudar a maestros y otros profesionales a entender como los niños aprendan dos lenguas. Ahora sabemos mucho sobre como los niños aprenden inglés, un poco sobre como los niños aprenden español, pero casi nada sobre como un niño aprende dos lenguas al mismo tiempo. Queremos entender mejor para que los maestros sepan cuando es normal que un niño bilingüe no hable claramente por que todavía esta aprendiendo, y cuando un niño no habla claramente y se beneficiaría de servicios de terapia.
- Ud. recibirá un certificado de regalo de cinco dolares cada año para llenar el cuestionario del desarrollo.
- Su hijo o hija recibirá un regalo pequeño cada 6 meses, probablemente un libro.
- Saber mas sobre el habla bilingüe va a ayudar a los maestros y a las escuelas servir mejor a sus hijos.

Appendix C

¿Que Hace Ud. Para Proteger Nuestra Privacidad?

Su privacidad es importante para nosotros. Hacemos muchas cosas para proteger su privacidad.

- Toda la información que obtengamos de este estudio y que pueda ser conectado a Ud. o su hijo o que puede identificarlos será totalmente confidencial. Esto quiere decir que los nombres de las personas conectadas con este estudio no serán dadas a ningún otra persona. Nadie más tiene acceso a esta información.
- Todos los videos, audios, y papeles escritos serán guardados en un archive con seguro en Portland State University. Sólo usaremos la información recibida de participantes para esta investigación.

¿Y Sí Tengo Preguntas?

Si Ud. tiene dudas o problemas sobre su participación en este estudio o sus derechos como una persona que participa en investigaciones, por favor llame: The Human Subjects Research Review Committee, Office of Research and Sponsored Projects, 111 Cramer Hall, Portland State University, (503) 725-4288. Si tiene preguntas sobre el estudio en si, contacte a Christina Gildersleeve-Neumann, por correo: Speech and Hearing Sciences Department, Portland State University, PO Box 751, Portland, OR 97207, por teléfono: (503) 725-3230, o por correo electrónico: cegn@pdx.edu.

¿Por Qué Tengo Que Firmar Esta Forma?

Esta es una forma de permiso. Su firma a continuación indica que:

- Ud. ha leído esta forma, o alguien se le ha leído a Ud., y que Ud. comprende su contenido.
- Ud. y su hijo quieren participar en este estudio.
- Ud. sabe que no tiene que participar en este estudio. Y aunque Ud. nos dé permiso hoy, Ud. sabe que puede cambiar su decision de participar en cualquier momento.
- Ud. recibirá una copia de esta forma.

_____	_____
Firma	Fecha
_____	_____
Testigo	Fecha

Appendix D

Informed Consent for Parents

BE PART OF AN IMPORTANT PROJECT Speech Development in Spanish-English Bilingual Preschoolers

Christina Gildersleeve-Neumann is conducting a study to learn more about how bilingual children learn to speak two languages. You and your child were selected as possible participants in this study because your child is of preschool age and has been exposed to Spanish and/or English in their home, and are participating in Head Start at the Knott site, where this study will be conducted.

If I Agree to Participate, What Will I Have To Do?

If you decide to take part in this project,

- You will be asked to fill out a two-part language and developmental history questionnaire about your child. You can fill this out yourself, or I can ask the questions and fill it out for you. This should take about 10 minutes.
- Every 4 months, your child will meet with me and another teacher for 15 minutes in English, and 15 minutes in Spanish as appropriate. (Please note that each time your child will be asked if they want to participate, and they will only participate if they verbally agree to do participate). These meetings will happen until your child turns 6. These meetings could be at the school, at a time when he/she is normally in class, or they could be scheduled separately. During the meeting, your child will be encouraged to speak in English or in Spanish while looking at various pictures and books. If your child is bilingual, one session will be conducted in English and another in Spanish. The sessions will be audio- and video- recorded so that the researcher can write down words your child said at a later time.
- At the beginning of next year, and the year after, I will contact you through a phone call to ask a few questions about your child's language and development. This will be about 5 minutes, just to see if there are any changes in language use or development, and to check to see if you have any questions.
- You don't have to agree to do this if you don't want to. And if your child doesn't want to, they won't be pushed to participate.

Although your child may miss some class time for this project, the researcher will work with the classroom teacher to find appropriate and convenient times within the classroom schedule for children to participate in the research.

What Will I Get In Return?

- You will receive a gift certificate of \$5 for completing the language questionnaire every year.
- The greatest benefit of this study is indirect as it may help to increase knowledge on bilinguals, which may help teachers and other professionals understand how children learn two languages. Right now, we know a lot about how children learn English, some about how children learn Spanish, but very little about how children learn both at the same time. We want to understand this better so teachers know when it's normal for bilingual children to speak unclearly because they're still learning, and when a child is very unclear and would benefit from speech therapy.

Your child will receive a small gift each time they participate, a book or a gift certificate.

- More complete knowledge about language development in Spanish/English bilingual children will also help schools better serve your children.

Appendix D

What Are You Doing To Protect Our Privacy?

Your privacy is very important to us. We have done many things to protect you:

- Any information that is obtained in connection with this study and that can be linked to you or identify will be kept confidential. This means that the names of people who take part in the study will not be given to anyone else. No one other than the researcher will have access to the information.
- All videotapes, audiotapes, and written records will be stored in a locked file cabinet at Portland State University. Information collected from participants will be used for research purposes only.

What if I have questions?

If you have concerns or problems about your participation in this study or your rights as a research subject, please contact the Human Subjects Research Review Committee, Office of Research and Sponsored Projects, 111 Cramer Hall, Portland State University, (503) 725-4288. If you have questions about the study itself, contact Christina Gildersleeve-Neumann by email at cegn@pdx.edu, or by mail at the Speech and Hearing Sciences Department, Portland State University, PO Box 751, Portland, OR 97207 or by phone, (503) 725-3230.

Why do I sign this form?

This is a consent form. Your signature below means that:

- You have read it or it has been read to you, and understand what it says.
- You and your child are willing to take part in the study by the researcher.
- You know that you do not have to take part in this study. And even if you agree, you can change your mind and stop at any time.
- You will get a copy of this form to keep for yourself.

_____ Signature _____ Date

_____ Witness _____ Date

Appendix E

Sección 3. PREGUNTAS SOBRE EL DESARROLLO DEL HABLA. Las siguientes preguntas ayudarán a comprender que tan clara su hijo puede hablar, como también si Ud. tiene dudas sobre como su hijo está aprendiendo hablar. Por favor, marque una respuesta por pregunta.

1. ¿Le es difícil comprender la pronunciación de su hijo/a? (marque uno)

Nunca Rara vez A veces Con frecuencia Todo el tiempo.

2. Si compara a su hijo/a con otros niños de la misma edad, ¿cree que su hijo/hija es difícil de entender? (marque uno)

Nunca Rara vez A veces Con frecuencia Todo el tiempo.

3. ¿Existen otras personas en la familia o amigos que piensan que su hijo/a es difícil de entender? (marque uno)

Nunca Rara vez A veces Con frecuencia Todo el tiempo.

4. ¿Cree que su hijo/a tiene dificultad pronunciando palabras? (marque uno)

Nunca Rara vez A veces Con frecuencia Todo el tiempo.

5. ¿Tiene su hijo/a problemas diciendo ciertos sonidos? (marque uno)

Nunca Rara vez A veces Con frecuencia Todo el tiempo.

6. Cuando su hijo/a habla, ¿**deja fuera** algunos sonidos de palabras? Por ejemplo, dice “so-” en vez de “sol” o “ota” en vez de “bota”? (marque uno)

Nunca Rara vez A veces Con frecuencia Todo el tiempo.

7. Cuando su hijo/a habla, ¿**cambia** sonidos en palabras? Por ejemplo, dice “tucio” en vez de “sucio”? (marque uno)

Nunca Rara vez A veces Con frecuencia Todo el tiempo.

8. Cuando su hijo/a habla, ¿se le nota frustrado?

Nunca Rara vez A veces Con frecuencia Todo el tiempo.

9. Si compara a su hijo/a con otros niños de la misma edad, ¿cree usted que tiene problemas al hablar? (marque uno)

No Probablemente no Tal vez Es posible Sí

10. ¿Hay personas en su familia o amigos que piensan que su hijo/hija tiene problemas con su idioma? (marque uno)

No

Probablemente no

Tal vez

Es posible

Sí

Appendix F

1. Is your child's pronunciation difficult to understand? (*Circle one*)

Never Rarely Sometimes Frequently All the time.

2. In comparison to other children his/her age, do you think your child is difficult to understand? (*Circle one*)

Never Rarely Sometimes Frequently All the time.

3. Do other people think your child is difficult to understand? (*Circle one*)

Never Rarely Sometimes Frequently All the time.

4. Does your child have difficulty pronouncing words? (*Circle one*)

Never Rarely Sometimes Frequently All the time.

5. Does your child have problems producing certain sounds? (*Circle one*)

Never Rarely Sometimes Frequently All the time.

6. Does your child leave out sounds when he/she speaks? For example, saying "ca" for "cat", or "tar" for "star?" (*Circle one*)

Never Rarely Sometimes Frequently All the time.

7. Does your child change sounds when he/she speaks? For example, saying ""too" for "shoe" or "wun" for "run?" (*Circle one*)

Never Rarely Sometimes Frequently All the time.

8. Is your child frustrated when he/she speaks? (*Circle one*)

Never Rarely Sometimes Frequently All the time.

9. In comparison to other children his/her age, do you think your child has speech problems? (*Circle one*)

No Probably not Maybe Probably Yes

10. Do other people think your child has speech problems? (*Circle one*)

No Probably not Maybe Probably Yes

agua
amarillo
anaranjado
anillo
araña
arco iris
ardilla
aspiradora
aviones
azul
bebe
bicicleta
blanco
caballo
camión
casa
arbol
cepillo
felíz
chaqueta
chico
grande
pequeño
pelotas
chocolate
cierre
cinco
seis
coche
cocina
columpio
crayola
verde
uno
dos
cuatro
cuchara
cuerda
dedo

Appendix G

dientes
diez
dinosaurio
doctor
ducha
elefante
escoba
escuela
espejo
estrella
flor
flores
siete
fresa
fruta
galletas
gallo
girafa
guitarra
hamburguesa
helado
helicóptero
hoja
huevos
humo
iglesia
jabón
juguetes
jugo
labios
lámpara
lápiz

leche
lentes
libro
luna
maestro/a
manzana
mariposa
martillo
montaña
naranja
negro
niño
nubes
ojo
oruga
oveja
pájaro
pan
pantalones
papas fritas
pelota
perro
pescado
pie
brazo
pierna
plátano
pluma
ratón
reloj
resbaladero
sapo

serpiente
silla
sol
sonrisa
tambores
tenedor
tigre
tijeras
tractor
triste
uvas
zanahorias

Appendix H

Please comment on the following if noteworthy. Just put a "check" if nothing is unusual.

Setting Comments (i.e., noise level, interruptions)

Child Behavior/Emotional Comments (shy, mad, other)

Factors Impacting Intelligibility (Loudness, Other)

Vocabulary & Language Comments

Did child attempt any English words for Spanish vocabulary?

Does child appear to you to have a speech delay or disorder?

Does the child appear to be atypical in any way? (Language, physical, IQ, etc.) Please comment.