

**SFF/RRG COVER SHEET**

Application Receipt Deadline: 4:00 p.m. Monday, October 2, 2006

Type of application:    SFF            RRG            Both

Name:                    Brenda Kaye Gorman, Ph.D.

Department:            Speech Pathology and Audiology

Phone and email:        288-1528, brenda.gorman@marquette.edu

Academic Rank:        Assistant Professor            MU Hire Date: 8/21/2006  
                              Associate Professor  
                              Full Professor

Descriptive Project Title (Limited to 120 characters, including spaces)  
Memory and language mechanisms underlying phonological awareness development: Evidence from sequential bilinguals

Have you searched for external funding?        Yes            No  
If yes, explain how you searched for external funding (even if your efforts were not successful)

What other support are you currently receiving?  
Start-up funds

This project involves (check all that apply):  
Human Subjects    Vertebrate animals    Recombinant DNA    Radioactive Materials  
Attach appropriate protocols or IRB/IACUC/IBC approval letters to your application package.  
**(Application submitted)**

Does this SFF/RRG application request graduate student support?        Yes            No

Have you ever applied for a SFF and/or RRG in the past?  
No.            Yes, I last applied for a SFF    RRG in October \_\_\_\_\_(year)

Date and type of your last COR Award:  
SFF \_\_\_/\_\_\_/\_\_\_            RRG \_\_\_/\_\_\_/\_\_\_            Did not receive award.

Title of your last COR award:  
N/A

Applicant signature and date  
*Brenda K. Gorman*    10-2-06

Chair/Unit Administrator signature and date  
*[Signature]*    10-2-06

### SFF/RRG PROJECT BUDGET

Name: Brenda K. Gorman  
Department: Speech Pathology and Audiology  
Project Title: Memory and language mechanisms underlying phonological awareness development: Evidence from sequential bilinguals

#### SFF/RRG BUDGET TABLE

Item	Funds Requested from the Committee on Research	Funds Requested from Other Sources (Name the Source)
SFF (\$5,500)	\$5,500	
RRG		
Other Personnel Salary (List)		
Equipment		
Supplies		
Travel		
Other (specify)		
<b>TOTAL:</b>	<b>A. \$5,500</b>	<b>B. \$</b>
<b>Total Project Cost (A+B)</b>	<b>\$ \$5,500</b>	

## ABSTRACT

The importance of phonological processing skills to literacy acquisition is well-established. Phonological awareness, the ability to reflect on and manipulate the sound components of language, is one phonological processing skill that has been shown to be a stronger predictor of reading development than IQ, language proficiency, and other conventional tests of reading readiness. Low phonological awareness is strongly associated with reading deficits and is even thought to cause reading failure in some children. Although there is extensive documentation of the role of phonological awareness in literacy acquisition, the basis for individual differences in and mechanisms underlying phonological awareness development are poorly understood. Language knowledge and working memory skills have been proposed as two possible underlying mechanisms. Current research provides conflicting support for the language-based versus the memory-based models of phonological awareness development. As a result, other ways of testing these models are necessary. Sequential bilingual children, who begin learning a second language after developing relative proficiency in their first language, present a natural experiment for examining the influence of language-specific knowledge and working memory processes on phonological awareness development.

The primary purpose of this study is to bridge the phonological awareness research conducted with monolingual and bilingual children and to extend the research on bilingual development in order to evaluate whether specific language knowledge or working memory processes provide the underlying support for phonological awareness development. The secondary goal is to compare the effects of instruction provided in children's first and second language on their phonological awareness growth.

In the present study, bilingual preschool children's phonological awareness performance will be measured in their first language, Spanish, and their second language, English, before and after receiving phonological awareness instruction in either Spanish or English. A significant difference between children's phonological awareness gains in Spanish and English would be expected according to the language-based model. If working memory skills predict children's phonological awareness growth in their more developed language, Spanish, and also in their less developed language, English, this would provide support for role of memory processes in phonological awareness at both earlier and later stages of language development. Thus, sequential bilingual children provide the unique opportunity to examine potential developmental trends in the relationships between working memory, language knowledge, and phonological awareness.

Results from this study will have theoretical implications regarding how children develop phonological awareness skills and why some children have more difficulty acquiring these skills than others. Practically, such information may facilitate early identification of children at risk for literacy difficulties. This research will also have implications for effective instructional approaches for bilingual children. Findings of forward transfer of phonological awareness skills from Spanish to English following instruction provided in Spanish would provide strong support for the proposal that building on children's skills in their first language, Spanish, would support their literacy acquisition in English. It is also possible that instruction in English will lead to backward transfer of skills from children's second language, English, to their first language, Spanish. A comparison of the outcomes of these instructional approaches is of significant interest in the field.

## PROJECT DESCRIPTION

### a) Research Objectives

The primary purpose of this study is to bridge the phonological awareness research conducted with monolingual and bilingual children and to extend the research on phonological awareness development in bilinguals in order to evaluate whether specific language knowledge or working memory processes provide the underlying support for phonological awareness development. The secondary goal is to compare the effects of phonological awareness instruction provided in children's first (L1) and second language (L2).

The specific research questions are: 1) Does phonological awareness instruction provided in Spanish (L1) lead to increased phonological awareness skills in English (L2), a process referred to as *forward transfer*? 2) Does phonological awareness instruction provided in English (L2) lead to increased phonological awareness skills in Spanish (L1), a process referred to as *backward transfer*? 3) Is there a significant difference between children's phonological awareness gains following instruction provided in L1 versus L2? 4) Which language of instruction leads to greater transfer of skills from one language to the other, a process called *cross-language transfer*? 5) How well does performance on measures of working memory predict children's phonological awareness growth? 6) Which working memory task, nonword repetition (a storage task) or the Complex Span Task-Early Spanish (a simultaneous storage and processing task) better predicts children's phonological awareness growth?

### b) Background and Significance

The importance of phonological processing skills to literacy acquisition is well-established. **Phonological awareness (PA)**, the ability to reflect on and manipulate the sound components of language (Gillam & van Kleeck, 1996), is a phonological processing skill that has been shown to be a stronger predictor of reading development than IQ, language proficiency, and other conventional tests of reading readiness (Adams, 1990; Juel, Griffith, & Gough, 1986; Manis, Seidenberg, & Doi, 1999; Muter, Hulme, Snowling, & Taylor, 1998; Stanovich, Cunningham, & Cramer, 1984; Wagner, Torgesen, & Rashotte, 1994). Low phonological awareness is strongly associated with reading deficits and is even thought to cause reading failure in some children (Kamhi & Catts, 1999). Although there is extensive documentation of the role of phonological awareness in literacy acquisition, the basis for individual differences in and mechanisms underlying phonological awareness development are poorly understood. Language knowledge and working memory skills have been proposed as two possible underlying mechanisms, each of which will be evaluated further in this study.

#### *Language knowledge and phonological awareness*

Some scholars have proposed that language-specific knowledge provides the underlying support for the development of phonological awareness. According to this position, phonological awareness involves analysis of words that have been stored in long-term memory. Some evidence suggests that young children store their first words holistically (Ferguson, 1986; Studdert-Kennedy, 1986; Walley, 1993). As they add more words to their repertoire, lexical restructuring occurs as long-term neural representations of words become more segmentalized (e.g., cat → c-at → c-a-t). Consistent with this language-driven view of phonological awareness development, Metsala and Walley (1998) argue that this gradual whole to part-word processing occurs on a word-by-word basis. Words that are more familiar, acquired at an earlier age, or have many similarly sounding neighbors (e.g., *cat*, *cap*, *cab*, *can*) should be stored in more

segmented form than other words, and thus, should be easier to analyze during PA tasks. Currently, some research provides supporting evidence for this language-based model (DeCara & Goswami, 2003; Metsala, 1999), while other research provides evidence against this model (Garlock, Walley, & Metsala, 2001; Gathercole, Willis, & Baddeley, 1991). Because there is conflicting evidence, other ways of evaluating this model are necessary.

### *Memory and phonological awareness*

An alternative view of the mechanisms underlying phonological awareness emphasizes the role of memory processes. This theoretical perspective is based on the well-known model of working memory proposed by Baddeley and Hitch (1974). The central executive and the phonological loop are thought to play important roles in the development of phonological awareness. The central executive is a limited capacity system that is responsible for control and regulation of cognitive processes. The phonological loop includes a short-term storage system that temporarily holds auditory information in memory and a subvocal rehearsal system that keeps that information active. These systems work together to encode acoustic, temporal, and sequential characteristics of sounds as stable phonological representations in long-term memory. PA may be dependent on working memory skills because the ability to reflect on sounds in words first requires activation of phonological representations, and these representations must then remain active long enough for the child to manipulate the sounds (Gillam & van Kleeck, 1996; Mann & Liberman, 1984). The short-term storage function of the phonological loop is critical to coding stable phonological representations (Gathercole, 1993). Consequently, limitations in working memory “may make it more difficult to discover and master” phonological awareness skills (Brady, 1991, pp. 130-131). There is evidence that supports (Mann & Liberman, 1984; Oakhill & Kyle, 2000; Wagner & Torgesen, 1987) and contradicts (Gillam & van Kleeck, 1996; Snowling, Hulme, Smith, & Thomas, 1994) the memory-based model of PA. Consequently, other ways of evaluating this model are necessary.

### *Phonological awareness development in bilinguals*

The majority of research specifically exploring underlying mechanisms of phonological awareness has been conducted with monolingual speakers. However, research with bilingual speakers may provide insight into this issue. Research with bilinguals has focused on exploring the relationship between PA skills in L1 and literacy acquisition in English. Cross-language transfer between Spanish and English is of particular interest, given that Spanish is the most common first language of students classified as Limited English Proficient in the U.S. (Kindler, 2002). Despite numerous differences in the phonologies of Spanish and English (for a review, see Gorman & Gillam, 2003) research indicates forward transfer of PA skills from Spanish to English (August, Calderon, & Carlo, 2002; Cisero & Royer, 1995; Durgunoglu, Nagy, & Hancin-Bhatt, 1993). This cross-language transfer may indicate that PA is not dependent on language-specific factors. Rather, such transfer may implicate the role of a general underlying cognitive mechanism, such as working memory, rather than language-specific skills per se.

Because current research provides conflicting support for the language-based versus the memory-based theories of phonological awareness development, other ways of testing these two models are necessary. Children who begin learning L2 after developing relative proficiency in L1 are referred to as *sequential bilinguals*. Given the differences in vocabulary knowledge, word familiarity, and age-of acquisition between L1 and L2, sequential bilinguals provide a natural

experiment for examining the influence of language-specific knowledge on phonological awareness. According to the language-based model, a significant difference between PA development in sequential bilinguals' first language (L1) and a less familiar second language (L2) would be expected. Bilinguals can also provide a natural experiment for examining whether working memory skills underlie development of phonological awareness. If working memory skills predict children's PA growth in both their more developed language (L1) and also their less developed language (L2), this would provide support for role of memory processes in phonological awareness at both earlier and later stages of language development. Moreover, bilinguals provide the unique opportunity to examine possible developmental trends in the relationships between working memory, language knowledge, and phonological awareness.

In the present study, I will examine children's phonological awareness performance in both Spanish (L1) and English (L2) before and after receiving PA instruction in either Spanish or English. Findings of forward transfer from L1 to L2 following L1 instruction would support Durgunoglu and her colleagues' (1993) proposal that building on children's skills in Spanish (L1) would support their literacy acquisition in English (L2). Manis, Lindsey, and Bailey (2004) noted that the correlations documented in previous longitudinal studies between L1 skills and later L2 skills may be mediated by English language growth over the course of the intervention period. In the current study, children's performance will be measured in both languages both before and after instruction, thereby addressing this methodological issue. As a result, the current study may offer stronger evidence that gains in English are a direct outcome of training in Spanish, and thus, a more direct measure of cross-language transfer than correlations reported previously. This pre-post instructional design will also provide an experimental condition of PA growth in which to evaluate the language-based and memory-based models of PA development. It is quite plausible that instruction in English would lead to *backward transfer* from L2 to L1 (Bates & MacWhinney, 1989). These findings would have interesting practical implications for pedagogical approaches. Theoretically, findings of backward transfer following training in English may also be interpreted as counter evidence to the language-based theory. In regards to testing the memory-based model, Oakhill and Kyle (2000) have cautioned against the exclusive use of simple storage tasks to measure working memory, as has often been the case in previous research. Rather, memory tasks should tap simultaneous storage and complex processing demands (Daneman & Carpenter, 1980). This methodological issue will be addressed in the present study by using the Complex Span Task-Early Spanish developed by the first author (Gorman & Gillam, in preparation) in addition to nonword repetition.

### **c) Relation to Applicant's Work in Progress and Long-term Goals**

This project is a critical next step in my line of research, the focus of which is phonological awareness development and cross-language transfer of language and literacy skills in bilingual children. In a preliminary study, I provided a short, intense period of phonological awareness instruction in Spanish (L1) to 25 sequential bilingual kindergartners. The instruction was developed based on a review of relevant phonological awareness tasks for Spanish-speaking children (Gorman & Gillam, 2003). Results of the preliminary study indicated that children made equivalent phonological awareness gains in L1 and L2 (Gorman, in preparation). These results appeared to provide contradictory support for the language-based model of PA. Performance on the Complex Span Task-Early Spanish was a strong predictor of Spanish gains and a moderate predictor of English gains, while performance on the nonword repetition task was a moderate predictor of gains in both Spanish and English (Gorman & Gillam, in

preparation). These results appeared to support the memory-based model over the language-based model of phonological awareness.

The next steps to be taken in the current project are to increase the duration of instruction to yield greater effect sizes, to examine backward transfer as well as forward transfer of PA skills, and to broaden the scope by examining a younger cohort in earlier stages of language and PA development in order to make more confident conclusions regarding these two models. Goals for future research include further examining the differences in children's memory skills and processing strategies in L1 and L2, analyzing the potential interaction between memory and vocabulary skills in phonological awareness development, identifying the level of these skills necessary to support forward and backward transfer of phonological awareness and other literacy strategies, and then, to carry out a more comprehensive early literacy intervention program for bilingual children based on accumulated knowledge regarding effective pedagogical approaches.

#### **d) Research Methods and Work Plan**

Thirty sequential bilingual preschoolers enrolled in local Head Start programs will participate in the study. Participants will be randomly assigned to receive PA instruction in either Spanish or English. Two clinicians will provide instruction in small groups for 20 minutes each day for six weeks during the summer of 2007. Pre-test and post-test measures will include the Receptive and Expressive One-Word Picture Vocabulary Tests- Bilingual Edition, the Complex Span Task-Early Spanish, a nonword repetition task, four age-appropriate subtests of the Test of Phonological Processing in Spanish, and their equivalent English subtests on the Comprehensive Test of Phonological Processing.

A three-way repeated measures analysis of variance will be performed with Instruction (Spanish, English) as the between-group variable and Time (Pre-test PA, Post-test PA) and Language (Spanish PA, English PA) as within-group variables. The main effect for Time will address whether training leads to a general increase in PA skills across both languages. A main effect for Language would indicate that children perform better in one language than the other across testing times. A significant Time by Language interaction would indicate that children make greater gains in one language than the other, supporting the theory that language-specific knowledge drives PA development. A nonsignificant Time by Language interaction would suggest that children make similar gains in L1 and L2, seriously challenging this theory. The Instruction by Time by Language interaction would indicate if one language of instruction yields significantly greater gains than the other. Follow-up analyses and effect sizes will be used to determine whether and the extent to which children in one instruction group benefit more than the other. An effect size of .2 will be considered small, .5 medium, and .8 large (Cohen, 1988).

To determine if working memory skills predict PA growth, multiple regression analyses will be performed with the two working memory measures (the Complex Span Task-Early Spanish and the nonword repetition task) as the independent variables and phonological awareness gains in Spanish and English as the dependent variables. R-squared values will specify how much variance in phonological awareness is accounted for by the working memory measures, indicating the level of power with which working memory performance predicts children's PA gains. A significant relationship between working memory and performance on PA tasks in both languages would provide support for the memory-based model of PA. A nonsignificant result would challenge this theory.

Finally, because it is possible that both memory and language knowledge contribute to PA development, hierarchical regression analyses will be performed to compare the predictive power of vocabulary and memory skills on PA growth and to then weigh the evidence.

**BRENDA KAYE GORMAN, Ph.D., CCC-SLP**

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College of Health Sciences  
Speech Pathology and Audiology  
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Phone: 414.288.1528

**EDUCATION**

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Ph.D.

The University of Texas at Austin, Department of Communication Sciences and Disorders, 2006

M.A.

The University of Texas at Austin, Department of Communication Sciences and Disorders, 1998  
Specialization in Bilingual/Multicultural Speech-Language Pathology

B.A.

University of Wisconsin-Madison, Department of Latin American & Iberian Studies, 1994

**HONORS AND AWARDS**

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Jamail Endowed Presidential Scholarship, The University of Texas at Austin, 2005

David Bruton Fellowship, The University of Texas at Austin, 2004

Research Grant Award, Department of Communication Sciences and Disorders, The University of Texas at Austin, 2003

Student Fellowship Award, US Department of Education, Multicultural Leadership Grant (Principal Investigator - Thomas Marquardt, PhD) 2001-2004

ABC Award, "Above and Beyond the Call" in Speech-Language Pathology, 1999

Student Fellowship Award, US Department of Education, Multicultural Training Grant (Principal Investigator - Elizabeth Peña, PhD), 1996-1998

**RESEARCH INTERESTS**

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Cross-language transfer of language and literacy skills in bilinguals

Processing-based measures of language assessment

Evidence-based language intervention

**RESEARCH**

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Research Assistant, Measurement of stuttering, PI - Dr. Ronald Gillam, The University of Texas at Austin, 2005-2006.

Principal Investigator, The relationships between working memory, language, and phonological processing: Cross-linguistic evidence. The University of Texas at Austin, 2004-2006.

Research Assistant, Phonological and morphological influences on early word learning. PI - Dr. Lisa Bedore, The University of Texas at Austin, 2003.

Research Assistant, A bilingual language assessment tool. PI - Dr. Elizabeth Peña, The University of Texas at Austin, 2002.

Research Assistant, Comparison of language intervention programs. U01 DC04562, PI - Dr. Ronald Gillam, The University of Texas at Austin, 2001-2002.

Research Assistant, Dynamic assessment of bilingual preschoolers. PI - Dr. Elizabeth Peña, The University of Texas at Austin, 1996.

## TEACHING

Instructor: Issues in Child Language Intervention, a graduate course in the department of Speech Pathology and Audiology at Marquette University, Fall, 2006.

Teaching Assistant: Fluency Disorders, a graduate course in Communication Sciences and Disorders at the University of Texas at Austin, Spring, 2006.

Instructor: Introduction to Speech and Language Assessment and Intervention in Children, an undergraduate course in Communication Sciences and Disorders at the University of Texas at Austin, Summer, 2004.

Teaching Assistant: Introduction to Speech and Language Assessment and Intervention in Children, a writing-intensive undergraduate course in Communication Sciences and Disorders at the University of Texas at Austin, Spring, 2004.

Teaching Assistant: Sociocultural Bases of Communication, an undergraduate course in the School of Communication at the University of Texas at Austin, Spring, 2003.

Guest Lecturer: "Best Practices in Multicultural Language Assessment" for Language Disorders in School-Age Children, a graduate course in Communication Sciences and Disorders at the University of Texas at Austin, Spring, 2003.

Guest Lecturer: "Language Diversity and Individual Differences" for Acquisition of Communication Abilities in Children, an undergraduate course in Communication Sciences and Disorders at University of the Texas at Austin, Summer, 2002.

Guest Lecturer: "Literacy Acquisition: The Role of the Speech-Language Pathologists" for Language Disorders in School-Age Children, a graduate course in Communication Sciences and Disorders at the University of Texas at Austin, Spring, 2002.

Instructor: Bilingual Methods in Speech-Language Pathology, a class series for graduate clinicians and clinical supervisors in Communication Sciences and Disorders at the University of Texas at Austin, Fall, 2001.

## PUBLICATIONS

Gorman, B. K., & Aghara, R. G. (2004). Conceptualizing bilingualism: Defining the standard for child language assessment. *Perspectives on Communication Disorders and Sciences in Culturally and Linguistically Diverse Populations*, 11(2), 19-24.

Gillam, R. B., & Gorman, B. K. (2004). Language and discourse contributions to word recognition and text interpretation: Implications of a dynamic systems perspective. In E. R. Silliman & L. C. Wilkinson (Eds.), *Language and literacy learning in schools* (pp. 63-97). New York, NY: Guilford Press.

X Gorman, B. K., & Gillam, R. B. (2003). Phonological awareness in Spanish: A tutorial for speech-language pathologists. *Communication Disorders Quarterly*, 25(1), 13-22.

Gorman, B.K., Clark, M., Fiestas, C., Peña, E. (in preparation). Creative and stylistic devices in storybook narratives: A cross-cultural study.

X Gorman, B.K., & Gillam, R.B. (in preparation). A memory-based model of phonological awareness: Evidence from Spanish speakers and cross-language transfer of skills. (Note: this manuscript will be submitted to the *Journal of Memory and Language*. Estimated submission date: October 9, 2006).

X Gorman, B.K. (in preparation). Dynamic assessment of phonological awareness in Spanish and cross-language transfer to English. (Note: this manuscript will be submitted to *Language, Speech, and Hearing Services in Schools*. Estimated submission date: November 15, 2006).

## PRESENTATIONS

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X  
Gorman, B.K. (June, 2006). The Relationships between Working Memory, Language, and Phonological Processing: Evidence from cross-language transfer in bilinguals. Poster presentation: Symposium of Research in Child Language Disorders, Madison, WI.

Gorman, B.K. (June, 2006). Bilingual assessment and the use of conceptual scoring. Presentation: Austin Area Association of Speech-Language Pathologists, Austin, TX.

Gorman, B.K., & Kester, E.S. (February, 2006). Minimizing over-identification of children in dual-language environments. Presentation: Austin Independent School District, Austin, TX.

Gorman, B.K., Aghara, R.G., Jacks, A.P., Fiestas, C.E., Fleming, V.B. (January, 2004). Communication makes the world go 'round. Recruitment presentation: Del Valle High School, Del Valle, TX.

Gorman, B.K., Clark, M., Fiestas, C.E., & Peña, E.D. (November, 2003). Creative and stylistic devices in storybook narratives: A cross-cultural study. Poster presentation: American Speech-Language-Hearing Association Conference, Chicago, IL.

Gorman, B.K., Clark, M., Fiestas, C.E., & Peña, E.D. (February, 2003). Cultural influences on children's use of creative and stylistic narrative devices. Poster presentation: Texas Research Symposium on Language Diversity, The University of Texas at Austin, Austin, TX.

Gorman, B.K. (April, 2002). Assessment of phonological awareness in Spanish. Presentation: Department of Communication Sciences and Disorders Research Colloquium Series at the University of Texas at Austin, Austin, TX.

Gorman, B.K. (March, 2001). Non-Biased Assessment for Culturally and Linguistically Diverse Students. Presentation for speech-language pathologists: Round Rock Independent School District, Round Rock, TX.

Nett, K.L., Gorman, B.K., White, M.D., Rambusch, B. (April, 1998). Multicultural training for SLPs. Presentation: Department of Communication Sciences and Disorders, the University of Texas at Austin, Austin, TX.

## CLINICAL MATERIALS

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Gorman, B.K., & Kester, E.S. (2003). Language assessment of bilingual children: Meeting the challenge. Multimedia online course and CD-ROM.

Gorman, B.K., & Kester, E.S. (2003). Spanish-influenced English: Typical phonological patterns in the English language learner. Online continuing education course.

Kester, E.S., & Gorman, B.K. (2003). Spanish-influenced English: Typical patterns of semantics and syntax in the English language learner. Online continuing education course.

Gorman, B.K. (1996). Providing culturally-sensitive speech and language services to Hispanic migrant students.

## PROFESSIONAL SERVICE

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Reviewer: American Journal of Speech-Language Pathology, Language, Speech & Hearing Services in Schools, Communication Disorders Quarterly, TEJAS.

## **CLINICAL EXPERIENCE**

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### **Bilingualistics Speech and Language Services (2001-2006)**

Austin, TX

- Co-Founder and Director.
- Provide consultation and speech-language services for Austin area schools and Early Childhood Intervention agencies.
- Develop and teach Continuing Education Courses.  
Supervise bilingual speech-language pathologists.

### **The University of Texas Speech and Hearing Clinic (Fall, 2001)**

Austin, TX

- Supervised graduate clinicians in speech-language pathology.

### **Capital Area Speech Language and Educational Services (2000-2001)**

Austin, TX

- Provided speech-language therapy and assessments for children with various communication disorders.

### **Round Rock Independent School District (2000-2001)**

Round Rock, TX

- Provided speech-language therapy and assessments for preschool, elementary, and middle school children in Spanish and English.
- Consulted other therapists in provision of appropriate services to culturally and linguistically diverse students.
- Supervised graduate student in clinical practicum.
- Member of the Preschool Transdisciplinary Play-Based Assessment Team.
- Participated in development and implementation of a Transdisciplinary Intervention curriculum for the bilingual preschool program.

### **Peninsula Associates (1999-2000)**

Menlo Park, CA

- Provided speech-language therapy and assessments for children and young adults with various communication needs at the Peninsula Associates office, Early Intervention Agencies, Head Start Centers, San Mateo-Foster City and South San Francisco School Districts.
- Conducted parent training to enhance their children's communication abilities.

### **TheraCare Rehabilitative Services (1998-1999)**

Manhattan, NY

- Provided home-based Early Intervention services and parent training for families from diverse cultural and linguistic backgrounds.
- Collaborated with physical therapists, occupational therapists, and special educators to carryover goals and maximize intervention effectiveness.

### **Migrant Head Start/United Migrant Opportunity Services (Summer, 1997)**

Wautoma, WI

- Internship to provide speech-language services in Spanish and English to children of migrant farmworking families.

### **University of Texas Speech and Hearing Center (1996-1998)**

Austin, TX

- Clinical rotations at the UT Speech and Hearing Center, Austin Independent School District, and Head Start centers.
- Provided evaluations and therapy for clients of bilingual/multicultural backgrounds; individual and group aphasia therapy; fluency and accent training.

**PROFESSIONAL CERTIFICATIONS**

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Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP), American Speech-Language Hearing Association #12019584

Speech-Language Pathology License, State of Wisconsin Department of Regulation and Licensing #2890-154

Texas Oral Proficiency in Spanish Certification

Teaching of English as a Foreign Language Certificate

**PROFESSIONAL MEMBERSHIPS**

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American Speech-Language-Hearing Association

American Speech-Language-Hearing Association Special Interest Division, Communication Disorders and Sciences in Culturally and Linguistically Diverse (CLD) Populations

American Speech-Language-Hearing Association Special Interest Division, Fluency and Fluency Disorders