

University of Minnesota Graduate School Doctoral Dissertation Fellowship Application
Personal Statement

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My initial decision to pursue a masters' degree in speech-language pathology was fueled by a passionate interest in human language and by the potential to apply that interest to the provision of a clinical service. Though I accrued research experience in the area of cognitive skills in children with language impairments during my M.A. studies, and enjoyed that experience, it was important to me to gain clinical experience in the field. After receiving my M.A., I began practice as a clinical speech-language pathologist working with children with communication disorders.

Three years later, I chose to return to the University of Minnesota as a doctoral student. Although I truly enjoyed the work as a clinical speech-language pathologist, I had become acutely aware of the need for greater knowledge about the clinical services I was providing. Do our systems of assessment accurately classify speech-language pathology clients and ultimately provide benefit to them? How and why do speech-language treatments work? The need for improved answers to these questions was apparent to me as a clinician; so also was the realization that those answers would lie in the pursuit of well-designed research. I was also excited by the opportunity to develop expertise in a specialized area and to be part of an intellectually stimulating community.

My doctoral program has been designed to develop my knowledge about accurate evaluation of intervention programs and about the interactions between cognitive and linguistic skills in children with developmental communication disorders. Thus, it is a natural continuation of both the work I undertook as an M.A. student and the clinically-driven questions that helped motivate my return to graduate school. My work on research projects during my M.A. degree and my first year of doctoral study provided me with a solid foundation in many research skills, including group experimental designs, data collection and analysis, and dissemination of results; however, the development of research interests that were truly my own accelerated during the second semester of my doctoral program.

During that second semester, my course in Single Subject Experimental Design (SSED) provided me with the tools to design intervention studies within the SSED paradigm. Using my knowledge from this course, I then developed an SSED intervention study exploring the effects of a nonlinguistic cognitive treatment for children with primary language impairment. I completed this project during the summer of 2007 with the assistance of a Graduate Research Partnership Program award from the Graduate School. This project has become the foundation of my dissertation study, which will evaluate a similar treatment using a group experimental design.

Since the summer of 2007, I have completed a second independent research project related to treatment in speech-language pathology; I used survey data to explore the characteristics of effective speech-language clinicians. I also was able to use the opportunity provided by my preliminary exams during the fall of 2008 to explore the literature regarding treatment of speech-sound disorders in children as well as the role of the Evidence-Based Practice movement in speech-language pathology. Each of these experiences has contributed to the design of my dissertation study, which I feel is truly the culmination of all of my doctoral work.

Upon completion of my doctoral program, I would like to find a faculty position in an environment that allows me to continue to develop a line of research devoted to assessing how and why treatments for developmental speech-language disorders work. The field of speech-language pathology is sorely in need of quality research to demonstrate the efficacy of its interventions, and I look forward to the opportunity to help fill this need. Completion of my dissertation project will provide me with optimal preparation for the role.

A Comparison Between Nonlinguistic Cognitive Processing Treatment and Traditional Language Treatment for Bilingual Children with Primary Language Impairment

2. Background

Primary Language Impairment (PLI; also known as Specific Language Impairment) is a developmental communication disorder that affects approximately 7% of children in the U.S. and is defined by delays in the acquisition of language alongside typical development of cognitive, neurological, and sensory skills (Tomblin et al., 1997). Thus, children with PLI are slower to learn grammar and vocabulary than their same-aged peers but have no obvious cause (such as a cognitive delay or a hearing loss) for their deficits. However, children with PLI do show subtle deficits in processing nonverbal information. Despite scoring within the average range on standardized tests of nonverbal intelligence, these children are slightly slower to complete many tasks that do not involve language – such as searching a computer screen for a specific shape or number, or pushing a button as fast as possible when a shape appears on a computer screen (Kohnert, Windsor, & Ebert, in press). Children with PLI also have more trouble maintaining attention to a task than their typically-developing peers (Spaulding, Plante, & Vance, 2008). These subtle deficits in processing speed and attention have been called cognitive processing weaknesses. Though it is debated, one hypothesis is that these cognitive processing weaknesses are an underlying cause of the language learning problems in PLI (e.g., Leonard et al., 2007).

Typically, PLI is treated by attempting to improve children's language skills such as vocabulary and grammar. However, if cognitive processing weaknesses do contribute to the language learning problems in PLI, treating these weaknesses could be another way to improve language skills in children with PLI. While a treatment that addresses cognitive processing weaknesses could benefit all children with PLI, the benefits may be particularly notable for bilingual children with PLI. These children need to be able to communicate in both English and their home language but in practice receive language treatment solely in English. In contrast, treating underlying cognitive processing deficits could lead to gains in both languages, supporting successful communication in both school and community settings.

In addition to the potential practical benefits of developing this treatment, examining the effects of treating cognitive processing weaknesses in children with PLI can provide a unique perspective on the longstanding theoretical debate regarding the relationship between cognition and language in this population. Bilingual children present an ideal population for examining this relationship, because the effects of treating cognitive processing weaknesses can be observed in two separate languages.

3. Goals and Objectives

The proposed study would explore the relationship between cognitive processing skills and language skills by attempting to change cognitive processing skills in children with PLI. More specifically, the purpose of the proposed study would be to evaluate the outcomes of a treatment for bilingual children with PLI that is designed to improve two specific cognitive processing skills, attention and processing speed. Treatment outcomes of interest include the targeted cognitive processing skills, language skills in the home or first language, and language skills in the second language. The experimental treatment would be compared to a more traditional treatment based on training English language skills and to no treatment. The study would seek to answer three research questions:

1. Does the cognitive processing treatment improve attention and processing speed in comparison to no treatment and in comparison to a language-based treatment?

The answer to this question will indicate whether attention and processing speed are directly

modifiable in children with PLI, and also whether traditional language-based treatments may influence them indirectly.

2. Does the cognitive processing treatment improve children's home or first language skills in comparison to no treatment and to language-based treatment?

The answer to this question will help to inform the theoretical debate over whether cognitive processing skills underlie language skills in PLI or are separate from them. It may also suggest a viable method for addressing first language skills in bilingual children with PLI when the clinician does not speak the first language.

3. Does the cognitive processing treatment improve children's second language skills in comparison to no treatment and to language-based treatment?

The answer to this question will further inform the debate over the relationship between language and cognitive processing skills in children with PLI, and also indicate whether nonlinguistic and linguistic treatments for PLI are complementary approaches.

4. Design and Methodology

Participants

Thirty Spanish-English bilingual children aged 6;0-8;11 will participate in the study. Participants will reside in households that speak primarily Spanish and attend schools that instruct primarily in English. All participants will demonstrate PLI. Children will be identified from those currently receiving special education services for language disorder, indicating that they demonstrate depressed scores on standardized language testing. They must also pass a hearing screening and score within the average range on a test of nonverbal intelligence.

Procedures

Children will be randomly assigned to one of three groups: an experimental cognitive processing treatment group, a traditional language treatment group, or a delayed treatment control group. Study participants assigned to one of the two active treatment groups will complete a total of 20 sessions over a period of 6 weeks, including 2 sessions of study qualification and pre-testing, 16 sessions of treatment, and 2 sessions of post-testing. Participants assigned to the delayed treatment group will complete only the 4 pre- and post-testing sessions during the 6-week experimental period (but will be offered the opportunity to complete either of the active treatments following the post-testing sessions).

During the pre-testing sessions, participants will complete a set of standardized and nonstandardized language assessments in both Spanish and English. They will also complete nonstandardized assessments of three areas of cognitive processing skills: sustained selective attention, nonlinguistic cognitive processing speed, and visual working memory. Treatment sessions for participants in the 2 active treatment groups will be scheduled 4 days per week for 3 hours per session, over a course of 4 weeks. Within each session, 2 hours will be devoted to treatment activities, with the remaining time devoted to transitions between activities and a 30 minute break. In the post-testing sessions, children will repeat the tests given during pre-testing to measure change in language and cognitive processing skills during the experimental period.

Treatment Conditions: Experimental Treatment

Participants assigned to the experimental treatment group will receive a nonlinguistic cognitive processing treatment program. Treatment activities will require speeded responses and sustained selective attention in order to target the proposed cognitive skills. All 6 activities were used successfully in a preliminary treatment study (Ebert & Kohnert, 2008) and all 6 activities use nonlinguistic stimuli (e.g., shapes, abstract symbols, musical noises). Examples of treatment activities include rapidly sorting cards based on the number or symbol on them; finding a target

symbol in a visual array; and replicating a sequence of tones.

Treatment Conditions: Traditional Treatment

Participants assigned to the traditional treatment group will receive an English language-based treatment involving a combination of currently used language therapy activities. The focus of treatment will be expanding vocabulary, practicing grammatical constructions, and following directions. Example treatment activities include answering riddles, completing sentences with grammatically appropriate word forms, and identifying pictures of new vocabulary items.

Analyses

To compare groups on treatment outcomes post-test scores will be analyzed using pre-test scores as the covariate. Effect sizes will be calculated. In addition, the study design will allow for a more detailed, descriptive analysis of the characteristics of children who appeared to demonstrate change as well as the types of language and cognitive measures that appeared most sensitive to change following the treatments.

5. Potential Significance of the Research

As the answers to the research questions outlined in Section 3 demonstrate, the proposed project has the potential for both theoretical and practical impact. It tests a crucial hypothesis about the relationship between cognitive processing deficits and language delays in PLI using an innovative approach. It may also provide insight into the mechanisms of change in more traditional language-based treatments for PLI; the current evidence base regarding traditional treatments for PLI is weak and this type of evidence is sorely needed. Finally, the research project may provide evidence in support of a promising new treatment for PLI.

6. Progress to Date and Schedule for Completion

To date, the project has been developed and proposed to the dissertation committee. All nonstandardized assessment tasks are prepared for use, except for the measure of attention. Treatment activities are already owned or have been identified for purchase. Efforts to determine the best site for the treatment to take place are underway and introductory portions of the dissertation will be written this spring. I will be taking a maternity leave during Fall 2009. Final study preparations, including recruitment and screening of potential participants, training of research assistants, and preparation of all necessary materials will take place in Spring 2009 so that data collection can begin in June 2010 and be completed by August 2010. Fall 2010 will be devoted to data analysis, writing the remainder of the dissertation, and dissertation defense.

7. Key References

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