

*Journal of the National Black Association  
for Speech-Language and Hearing*

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# *Journal of the National Black Association for Speech-Language and Hearing*

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# *Journal of the National Black Association for Speech-Language and Hearing*

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## *About the Editor*

**Kenyatta O. Rivers, Ph.D.**, CCC-SLP, *JNBASLH*'s Editor, is an Associate Professor in the Department of Communication Sciences and Disorders at the University of Central Florida in Orlando, Florida. Dr. Rivers teaching, research, and clinical interests include language/literacy disorders in children and adolescents, pragmatic language differences and disorders in African American children and adolescents, cognitive-communication disorders in children, adolescents, and adults, and evidence-based practice in schools. He is an ASHA Fellow and a Board Member of the National Black Association for Speech-Language and Hearing. He is an editorial reviewer for a number of journals, including *Language, Speech, and Hearing Services in Schools*, the *American Journal of Speech-Language Pathology*, the *Journal of Speech-Language-Hearing Research*, and *Aphasiology*, and an Associate Special Issue Editor for *Topics in Language Disorders*. In addition, Dr. Rivers is a Member of the Communication Sciences and Disorders Clinical Trials Research Group and the ASHA SIG 14 (Communication Disorders and Sciences in Culturally and Linguistically Diverse Populations). E-mail address: kenyatta.rivers@ucf.edu.

## *About the Associate Editor*

**Robert Mayo, PhD**, CCC-SLP, *JNBASLH*'s Associate Editor, is a professor in the Department of Communication Sciences and Disorders at The University of North Carolina at Greensboro. Dr. Mayo has served as Associate Editor for *JNBASLH* and as an editorial reviewer for journals published by the American Speech-Language-Hearing Association such as the *Journal of Speech-Language-Hearing Research and Language, Speech, and Hearing Services in Schools*. He has published and presented papers in his primary areas of scholarly interest: fluency disorders, craniofacial anomalies, and public perceptions of communication disorders and differences. E-mail address: r\_mayo@uncg.edu.

## *Contributing Editors*

The following individuals served as reviewers or otherwise contributed, editorially, to this issue of *JNBASLH*. We thank them for their contributions to the journal (any omissions were certainly unintentional):

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## About the Journal

The *Journal of the National Black Association for Speech-Language and Hearing (JNBASLH)* is a peer-reviewed, refereed journal that welcomes submissions concerning communication and communication disorders from practitioners, researchers or scholars that comprise diverse racial and ethnic backgrounds, as well as academic orientations.

The *JNBASLH* welcomes submissions from professionals or scholars interested in communication breakdown and/or communication disorders in the context of the social, cultural and linguistic diversity within and among countries around the world.

The *JNBASLH* is especially focused on those populations where diagnostic and intervention services are limited and/or are often provided services which are not culturally appropriate. It is expected that scholars in those areas could include, but not limited to, speech-language pathology, audiology, psychology, linguistics and sociology. Articles can cover any aspect of child or adult language communication and swallowing, including prevention, screening, assessment, intervention and environmental modifications. Special issues of *JNBASLH* concerning a specific topic may also be suggested by an author or through the initiation of the editors.

## Aims & Scope

Topics accepted for publication in *JNBASLH* could include, but is not limited to, the following:

- Communication breakdowns among persons due to culture, age, race, background, education, or social status
- Use of the World Health Organization's International Classification of Functioning, Disability, and Health (ICF) framework to describe communication use and disorders among the world's populations.
- Communication disorders in underserved or marginalized populations around the world
- Service delivery frameworks for countries' minority populations, including those who are minorities for a variety of reasons including race, religion, or primary language spoken.
- Dialectical differences and their effects on communication among populations
- Evidence base practice research with culturally and linguistic diverse populations
- Provision of communication services in low income/resource countries
- Provision of communication services in middle income/resource countries
- Provision of communication services to immigrant and/or refuge populations
- Effects of poverty on communication development and the provision of services
- Education/training issues in serving diverse populations
- Ethical issues in serving diverse populations
- Role of religion in views of communication disability and its effect on service delivery

Submissions may include:

- research papers using quantitative or qualitative methodology
- description of clinical programs
- theoretical discussion papers
- scientifically conducted program evaluations demonstrating
- clinical forums
- works using disability frameworks or models effectiveness of clinical protocols
- critical clinical literature reviews
- case studies
- tutorials
- letters to the editor.

# Submission of Manuscripts

All manuscripts should be accompanied by a cover letter (e-mail) in which the corresponding author:

- Requests that the manuscript be considered for publication;
- Affirms that the manuscript has not been published previously, including in an electronic form;
- Affirms that the manuscript is not currently submitted elsewhere;
- Affirms that all applicable research adheres to the basic ethical considerations for the protection of human or animal participants in research;
- Notes the presence or absence of a dual commitment;
- Affirms that permission has been obtained to include any copyrighted material in the paper; and
- Supplies his or her business address, phone and fax numbers, and e-mail address.

All manuscripts must be submitted electronically and should follow the style and preparation presented in the *Publication Manual of the American Psychological Association* (Sixth Edition, 2010; see Journal for exceptions to APA style). Particular attention should be paid to the citing of references, both in the text and on the reference page. Manuscript submissions and inquiries should be addressed to: [nbaslh@nbaslh.org](mailto:nbaslh@nbaslh.org).

# Preparation of Manuscripts

Manuscripts must be written in English. Authors are referred to recent copies of the journal and are encouraged to copy the published format of papers therein.

Text should be supplied in a format compatible with Microsoft Word for Windows (PC). All manuscripts must be typed in 12pt font and in double-space with margins of at least 1-inch. Charts and tables are considered textual and should also be supplied in a format compatible with Word. All figures, including illustrations, diagrams, photographs, should be supplied in .jpg format.

Authors must write clearly and concisely, stating their objectives clearly, defining their terms, and substantiating their positions with well-reasoned, supporting evidence. In addition, they are encouraged to review articles in the area they are addressing which have been previously published in the journal and, where they feel appropriate, to reference them. This will enhance context, coherence, and continuity for readers.

All submissions are considered by the editorial board. A manuscript will be rejected if it does not fall within the scope of the journal or does not meet the submission requirements.

Manuscripts deemed acceptable will be sent to a minimum of two reviewers. The Editor and Associate Editor will consider the reviews and make a decision regarding a manuscript. Decisions are made on a case-by-case basis, typically within 6 weeks from submission, and the Editor's decision is final.

## *Disclaimer & Ethics Statement*

The *JNBSALH* is not responsible for the claims and findings that researchers and others make, or imply, or the accuracy and authenticity of information that is released in the journal. Authors are expected to have research data that substantiates their claims. The editorial board reserves the right to refuse, reject, or cancel an article for any reason at any time without liability.

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## *Sponsoring Organization*

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# *Journal of the National Black Association for Speech-Language and Hearing*

## *Editor's Note*

As I come onboard as Editor of the *ECHO: Journal of the National Black Association for Speech-Language and Hearing*, I would like to say that it is a tremendous honor and privilege for me to serve the readership in this role. Clearly, the journal is a testament to the forward-thinking, cutting-edge vision of a small group of scholars in the professions of audiology and speech-language pathology who recognized and understood the need for a journal that focuses on the “. . . *communication and communication disorders within and among the social, cultural and linguistically diverse populations, with an emphasis on those populations who are underserved.*” In fact, I read with great respect and admiration the Editor's Note that Dr. Ronald Jones, Managing Editor, wrote when the journal was first launched in the spring of 2005. He wrote: “*As an electronic journal, ECHO provides a no to low cost vehicle for disseminating relevant and timely articles addressing the interests and concerns of CSD professionals serving Black and other ethnic group populations. . .*”

Much has certainly changed in the professions of audiology, speech-language pathology, and speech, language, and hearing sciences since the journal was first launched, including, but not limited to, the roles and responsibilities of audiologists and speech-language pathologists as it pertains to the prevention, assessment, and management of communication disorders in the clinical populations served. Yet, some things have remained the same in the professions, including, but not limited to, the need for high-quality qualitative and quantitative research that allows practitioners and researchers to more effectively identify, describe, and manage communication disorders and differences in children, adolescents, and adults from culturally and linguistically diverse backgrounds. From my perspective, *ECHO: Journal of the National Black Association for Speech-Language and Hearing* has been instrumental in meeting some, if not many, of those needs over the years.

Who am I to take on the editorship of *ECHO: Journal of the National Black Association for Speech-Language and Hearing*? I bring to the table more than 25 years of research, teaching, and clinical experiences in pragmatic language development/disorders in children and adolescents from culturally/linguistically diverse backgrounds, child language-based reading disabilities and differences, evidence-based assessment and intervention, and other related areas. I graduated in 1988 and 1990 with a bachelor's and master's degree in communicative disorders, respectively, from the University of Central Florida and in 1994 with a Ph.D. in Speech-Language Pathology from the University of Florida. I am an Associate, tenured faculty member at the University of Central Florida, where I have been employed for the last 22+ years. I have served as a Special Issue Editor for *Topics in Language Disorders* and an editorial reviewer for a number of regional, national, and international peer-reviewed journals, including, the *American Journal of Speech-Language Pathology, Language, Speech, and Hearing Services in Schools, Journal of Speech, Language, and Hearing Research, the International Journal of Communication and Language Disorders, Aphasiology, eHEARSAY Journal of the Ohio Speech-Language-Hearing Association*, and, of course, *ECHO: Journal of the National Black Association for Speech-Language and Hearing*. In addition, I have served as a Board Member of, but not limited to, the National Black Association for Speech-Language and Hearing (NBALSH), the Central and North Florida Chapter of the Alzheimer's Association, and the Communication Sciences and Disorders Research Group (CSDRG).

My vision for *ECHO: Journal of the National Black Association for Speech-Language and Hearing* is pretty straightforward: (1) to increase the number of articles published in each issue of the journal; (2) to encourage the submission of thought-provoking, impactful articles; (3) to increase the number of scholars who publish in and serve as reviewers for the journal, including younger scholars; (4) to have the journal indexed in selected databases; and (5) to process and review manuscript submissions in a timely fashion. In accordance with long-standing editorial policy, the journal will continue to focus on “. . . *communication and language/literacy development, disorders, and differences in the context of the social, cultural, and linguistic diversity within and among countries around the world. . . (and) . . . on those populations where assessment and intervention services are limited and/or are administered in ways that are not culturally-sensitive and culturally-fair. . .*”

Thankfully, I will not be working to bring this vision to fruition on my own. Dr. Ron Jones, my predecessor, deserves special recognition for launching and bringing *ECHO: Journal of the National Black Association for Speech-Language and Hearing* to its current height as Managing Editor from 2005 through 2016 and for his willingness to assist others and me of the editorial board in whatever ways he can to ensure that the journal's purpose continues to be achieved. In addition, Dr. Robert Mayo, the journal's former Executive Editor, has agreed to stay on the editorial team and serve as our Associate Editor. As you may already be aware of, Dr. Mayo brings invaluable experience in scholarly publication, clinical practice, and postsecondary administration; thus, we can expect to make even bigger gains with the journal in the issues to come.

With this Editor's note, a change to the journal's title is introduced. Specifically, it will change from *ECHO: Journal of the National Black Association for Speech-Language and Hearing* to the *Journal of the National Black Association for Speech-Language and Hearing* (JNBASLH) with this issue. From my point of view, the decision to change the title is not an easy one, and I know that there is a sentimental element involved when a journal that has been in existence for more than a decade undergoes a title change. Discussions, however, have occurred a number of times in recent years among editorial board members and others as to whether a title change might increase the journal's recognition and competitiveness nationally and internationally.

For some time, the number of manuscripts that have been submitted and accepted for publication has waxed and waned, and there still is confusion in the scientific community and elsewhere with regards to the whether the name *ECHO* refers to the peer-reviewed journal or the old NBASLH periodical/newsletter that had the same name. It, therefore, has become clear to past and current editorial board members and others that a change in the journal's title to *JNBASLH* will increase its recognition and perception in the scientific community as a fitting venue for research. Moreover, it will most likely increase the recognition and visibility of NBASLH. Although the journal's title is changing to *JNBASLH*, it should be noted that the journal's successes and achievements in the past will not be left behind as the editorial board moves forward with increasing its recognition and competitiveness in the scientific community!

Similar to previous issues of the journal, this issue of *JNBASLH* contains a range of articles on topics that speech-language pathologists, audiologists, and related professionals may encounter as they work with children, adolescents, and adults from culturally and linguistically diverse backgrounds and other backgrounds. In their article, Chakraborty, Domsch, and Gonzales explored examined the influence of age of academic second language exposure on mazes, Mitchell and Wyre explored students' perceptions of collaborative testing in introductory courses at two universities, and Resendiz, Bedore, Peña, Fiestas, Gonzales, and Schwarz compared measures of syntactic complexity in the narrative productions of children from culturally and linguistically diverse backgrounds after two intervention sessions. On the other hand, Schwarz, Gonzales, Resendiz, and Abdi surveyed bilingual speech-language pathologists who treat Spanish-English preschoolers to identify the complex relationships that exist among the book, adult, and child. Finally, Schwarz, Resendiz, Hervey, and Matson analyzed the transcription accuracy of undergraduate students majoring in communication disorders.

Finally, as I assume the role of Editor of *JNBASLH*, I welcome input from all, including our readers and contributors. I also look forward to working the editorial board and staff as we take the journal to the next level of excellence!

Kenyatta O. Rivers, Ph.D., CCC-SLP  
Editor

# *Journal of the National Black Association for Speech-Language and Hearing*

***GREAT MINDS DON'T THINK ALIKE, THEY COMMUNICATE TO COLLABORATE***

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## **ABSTRACT**

Historical and contemporary studies focusing on collaborative learning have cited benefits regarding student performance and retention of course content. However, few researchers have focused on the usage of collaborative testing in introductory courses and more specifically the perceptions of the experience as communicated by students. To help address this gap in the literature, the authors explored students' perceptions of collaborative testing in introductory courses (communication sciences and disorders and human resource development) at two universities. Study results indicate usage of collaborative testing in introductory courses helps students to process course information at a deeper level and learn effective communication strategies to work cooperatively with peers. Implications for instructors are also addressed to aid in effective implementation of this learner-centered teaching strategy in introductory courses.

**KEYWORDS:** Collaborative learning; collaborative testing; group testing; learning strategies; introductory courses, scholarship of teaching and learning

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## **INTRODUCTION**

As the workplace continues to become more focused on technology, resources, budgets, and efficiencies, collaborative and group efforts are more commonly used to complete tasks and accomplish goals. Employers not only anticipate but expect employees to work together in teams or groups to meet and exceed performance goals. Interestingly, instructors often choose to integrate learning strategies focusing on individual efforts when preparing students (future employees) for their roles in the workplace. Such learning strategies do not necessarily require students to interact, engage, and collaborate with their peers. Recognizing this, one may ponder whether collaborative learning strategies or individual learning strategies are more effective in preparing students to work in contemporary work environments. As experimental and longitudinal research may be needed to explore these phenomena, the usage of collaborative learning strategies, such as collaborative testing, should not be shelved in anticipation of collective academic resolve.

### **Connected Literature**

Literature pertinent to learning theory, learner-centered instruction, and collaborative learning and testing in higher education settings was reviewed for this research. Each of these facets of literature regarding learning provides the framework for the importance of focusing on the learners' needs and keeping them as the focal point of instructional methods. Learner-centered approaches allow students to become partners in their learning experience, while exploring with the instructor what will help them better understand and enhance learning (Weimer, 2013). Collaborative learning involves inclusive efforts of the instructor and students to create knowledge (Davidson & Major, 2014). Interconnected is collaborative testing, which is fundamentally rooted in reflection about what has been learned while engaging and soliciting the same from classmates or peers.

### **Related Theories**

Two underpinning theories were primarily utilized for this study of collaborative testing. The first of which was the theory of student involvement (Astin, 1984). The theory of student involvement adheres to a psychological viewpoint, wherein student involvement and the

investment of energy are essential to bring about the desired learning and development in a particular curriculum. The second foundational theory is the social constructivist theory credited to Lev Vygotsky (1978). Social constructivist theory, also known as the social development theory, stresses the fundamental role of social interaction in the development of cognition and focused on the significant role that community plays in the process of generating knowledge. This concept is referred to as co-operative or collaborative dialogue by Vygotsky. Vygotsky's work is based on two main principles of cognitive development: a) the more knowledgeable other (MKO) and b) the zone of proximal development (ZPD). The more knowledgeable other refers to someone who has a better understanding of a higher ability level than the learner with respect to a particular task, process, or concept (Vygotsky, 1978). Newer perspectives have been cited in the literature e.g., the cognitive developmental perspective which draws heavily on the constructivist theory and purports that ideas revealed in groups help individuals to discuss pros and cons to test their ideas. There is also the Positive Interdependence Theory (Johnson, Johnson & Smith, 1998) which specifies that students may be motivated to unite around a common goal.

### **Learner-Centered Instruction**

Learner-centered experiences integrated early in the curriculum, particularly in introductory courses, are associated with long-term improvements in learning (Derting & Ebert-May, 2010). Additionally, implementation of learner-centered experiences may also provide benefits to students which extend beyond the class where the learner-centered experience occurred (Derting & Ebert-May, 2010). Bearing these things in mind, introductory course instructors choosing to adopt learner-centered instruction have a unique opportunity to shape the students' viewpoint regarding their success in the major or discipline.

Regarding class size, smaller classes were determined to be associated with more learner-centered instruction and delivery (Walczyk & Ramsey, 2003). As a result, Walczyk and Ramsey (2003) advocate scaling down large introductory courses, specifically in science and math, to smaller classes in order to provide students with more

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positive experiences. However, larger classes are also conducive to learner-centered experiences and instructors can successfully implement such strategies therein (Blumberg, 2009).

Researchers have asserted that commitment, willingness, and risk are associated with implementing learner-centered strategies in undergraduate courses (Walczyk & Ramsey, 2003). Commitment and risk enter the dialogue surrounding learner-centered instruction because learner-centered instruction comprises a variety of instructional methods and shifts the role of the instructor from teacher to facilitator (Blumberg, 2009). To aid instructors in this paradigm shift, Blumberg (2009) provides a comprehensive guide for faculty seeking to implement learner-centered instruction in college courses. Embracing learner-centered instruction requires instructors to: change their teaching method; focus more on pupils' needs; incorporate opportunities for feedback and reflection; partner with students; and enlighten students to become intrinsically motivated to learn (Blumberg, 2009; Weimer, 2013).

## **Collaborative Learning & Testing**

The purpose of collaborative learning is to enable students to unite and work towards a common academic goal (Gokhale, 1995). As previously stated, collaborative learning involves the combined efforts of students and instructors. As such, these collective efforts may be applied in multiple forms. Student interactions perpetuate collaborative learning; hence, the application to the learning environment may come in the form of various group activities. Instructor and student partnerships also promote collaborative learning; these may be applied to the learning environment through the usage of learning contracts (Sheridan, Byrne, and Quina, 1989). Collaborative learning strategies may be applied in any area of study, as Sheridan, Byrne, and Quina (1989) provided clear examples of application in economics, zoology, chemistry, and English.

While research on collaborative learning often focuses on the positive aspects, there are dissenting views on the topic. For example, Shea (1995) describes various issues with collaborative learning from both the instructor's and students' points of view. Regarding students, Shea asserts that the prevailing issue is they dislike the difficulty of working in groups and would rather work solo. Shea further cites resentment for carrying along weaker students, lazy students or colleagues failing to do their

share, and inability to make scheduled meetings as issues for students engaging in collaborative learning. Shea (1995) additionally maintains that learning is not necessarily automatic, as groups tend to partition work rather than work collaboratively throughout the entire project/assignment. Hence, students typically work on aspects of the project they feel most comfortable addressing. Dressler, Matthews, and McDown (2009) identify issues similar to those identified by Shea (1995). However, Dressler, et al. (2009) asserts that students shifting from a competitive nature to a collaborative nature, along with having to take increased responsibility for their own learning as issues needing attention.

Planning is required in order to implement collaborative learning strategies. However, it is essential for instructors to understand that there is no requirement regarding the extent to which these strategies must be implemented for learning to occur. Accordingly, the instructor's discretion and level of comfort determine the extent to which collaborative learning occurs in the classroom.

Although the concept of incorporating collaborative and group strategies in learning is not new, few contemporary writings focus on collaborative testing practices, student and instructor perspectives of collaborative testing, and collaborative testing outcomes (Clinton & Kohlmeyer, 2005; Srougi, Miller, Witherow, & Carson, 2013; Wiggs, 2011). Perhaps this is so because instructors customarily use individualized testing to assess learning. However, an alternative to the traditional, individual testing approach is collaborative testing. Collaborative testing allows students to work together to complete a test (Russo & Warren, 1999). Collaborative testing is a strategy used in collaborative learning environments. Collaborative testing has been used in various undergraduate courses including accounting, education, English, chemistry, molecular biotechnology, and nursing to name a few (Clinton & Kohlmeyer, 2005; Ley, Hodges, & Russ, 1995; Russo & Warren, 1999; Srougi, Miller, Witherow, & Carson, 2013, Wiggs, 2011).

There is no specific format when incorporating collaborative testing. The collaborative testing schema is determined by the instructor and testing may be completed in class or outside of the classroom. Collaborative testing may encompass a wide range of formats including: a) combinations of collaborative take-home tests and individual in-class tests (Srougi, Miller, Witherow, & Carson, 2013); b) collaborative essay tests

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(Muir & Tracy, 1999); and c) simultaneous collaborative and individual testing (Wiggs, 2011). In addition, the instructor determines if the groups are ad hoc or fixed and self-selected or instructor-selected (Clinton & Kohlmeyer, 2005).

Usage of collaborative testing has been found particularly useful in introductory courses, as instructors seek to reinforce core, foundational concepts in their respective disciplines (Allison, 2014; Pace, 2014; Shana, 2014). Although some students may be leery and doubtful of the nontraditional collaborative testing approach, prefer to work alone, and seek to avoid group work, doing so avoids and limits insight and perspective from other students. Solo practices such as these often do not reflect what is experienced and promoted in the present-day workplace. Students, as well as instructors, participating in collaborative testing responded favorably when questioned or given the opportunity to reflect on the experience (Muir & Tracey, 1999; Srougi et al., 2013). Even though the students' disposition towards collaborative testing has been favorable, Cortright, Collins, Rodenbaugh, and DiCarlo (2003) provide evidence that collaborative testing enhanced student performance and improved retention of course information. Further, Cortright et al. (2003) concluded that collaborative testing is useful for assessment and learning. Interestingly, the work of Cortright et al. (2003) also helps instructors to embrace collaborative testing by challenging the view of collaborative testing whereby the researchers emphasize that the approach can help teachers teach and students learn. Elsewhere, Leight, Saunders, Calkins, and Withers (2012) reported that collaborative testing improved student performance but did not improve content retention in a large-enrollment introductory biology course.

Closely related to collaborative testing is partner testing. Partner testing is an approach that allows a student to complete a test or examination with a partner. Partner testing may be particularly useful for developmental students and aids in learning by enhancing students' commitment to course material, creating study and dialogue opportunities outside the classroom, and helping students develop new learning and test-taking skills (Ley, Hodges, & Russ, 1995). Although implementing collaborative and partner testing can increase instructor preparation time, students perceived these testing methods as positive experiences aiding in understanding course content (Ley, Hodges, & Russ, 1995).

## **Cooperative Learning**

Whereas the connected literature primarily focuses on learner-centered instruction and collaborative learning, we cannot ignore cooperative learning. As cooperative learning is closely related to collaborative learning, Davidson and Major (2014) seek to distinguish cooperative learning and collaborative learning by identifying essential features and goals of each approach. Further it is the adeptness of Johnson, Johnson, and Smith (1998), as well as Davidson and Major (2014), which particularly help us recognize the juxtaposition of these two approaches. There are five elements that are critical to cooperative learning (Johnson, Johnson, & Smith 1998). These include positive interdependence, individual accountability, promotive interaction, social skills, and group processing. Accordingly, Johnson et al. (1998) provides clear guidance regarding how the instructor should proceed when integrating these elements into the collaborative learning process.

## **Purpose**

Two instructors of introductory courses, one in speech-language pathology and the other in human resource development, endeavored to find a way to engage students in a collaborative experience that would promote learning, compel focused discussion, and encourage peer communication and interactions. To meet these objectives, the instructors decided to implement collaborative testing as a means of reviewing and reinforcing foundational content taught at the beginning of the semester. The purpose of this study was to explore students' perceptions of collaborative testing in introductory courses at two universities. In this work we also seek to generate, expand, and share knowledge regarding collaborative testing, particularly students' perceptions, and its usage in introductory courses.

Whereas student learning outcomes are more likely perceived as a stronger indicator of the usage of collaborative testing in the introductory courses, this study examines students' perceptions of collaborative testing. This is due to the manner in which collaborative testing was utilized in the introductory courses. In both classes, the instructors used collaborative testing after the students had completed the test individually. In addition, the collaborative test did not replace the original test score earned by the students. Hence, in both classes collaborative testing was utilized as an auxiliary

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pedagogical strategy. Further, students engaged in collaborative testing in an effort to build foundational knowledge in introductory courses and to communicate ideas clearly to one another. Students' perceptions of this experience provide insight into how collaborative testing may be used in introductory classes. A profusion of feelings, interactions, self-examination, and suggestions emerged from the students' participation in collaborative testing. The research question formulated to execute this study was: What are the perceptions of students in introductory classes regarding collaborative testing?

## **METHODS**

### **Participants**

The population for this qualitative study consists of 33 students enrolled in an introductory course at a large university (15,000 students or more) in the Southeast, and 22 students enrolled in an introductory course at a medium sized university (5,000 – 15,000 students) in the Midwest. For identifying purposes of this study, the introductory course at the large university will be referred to as Class I with introductory course content focused on clinical practice in speech-language pathology and audiology. Accordingly, the introductory course at the medium sized university will be referred to as Class II throughout the study with course content focused on foundational principles and characteristics of human resource development. Approval for this study was obtained from the Institutional Review Board at both institutions. Students were not subject to harm or adverse action, and all information provided was voluntary.

### **Midterm Examination Instructions**

Collaborative testing was utilized with undergraduate students enrolled in introductory courses at the two universities after students individually responded to questions that were cumulative up to the mid-term of the semester. The midterm exam was a closed book exam that was timed and given electronically during the usual class meeting time. Both instructors proctored their exams at their respective universities. Students used their personal laptops to complete the individual exam. Both exams consisted of a total of 35 questions given in the format of multiple choice and true/false questions. Students received immediate electronic scores after completing the test sixty minute. Moreover, students were instructed to complete the exam individually without any study aids.

### **Group Collaborations**

After completing the individual exam, students in both Class I and Class II were given an opportunity to collaborate with their peers to enhance processing the course content at a deeper level of understanding. The collaborative exam in both Class I and Class II consisted of the same questions as the mid-term exam. Students in Class I and Class II were placed in instructor assigned groups to complete the collaborative group test.

Class I students were provided the collaborative group test in paper format while Class II students received the group test in an electronic format. They were instructed to select one group member to submit/record the group's answers. Both instructors provided no additional instructions regarding whom the groups should select to submit their answers. Students were given 20 minutes to work in groups to complete the collaborative test and were allowed to use aids (e.g., notes, etc.).

Upon completing the collaborative tests in Class II, each group received a score and was allowed to view the questions missed. After all groups completed the collaborative test, the instructor facilitated a class review of the collaborative test. During this review, all students were encouraged to participate by sharing their group's answers and the rationale for their answer choice. The correct answer was confirmed by the instructor and key points were reinforced.

After all students completed the individual exam in Class I, the students reviewed the exam questions with their assigned group members of the class. After the students completed the exam as a group, they turned in the answer sheets to the instructor. The answer sheets were dispersed to other group members to check for the correct answer choices while the instructor announced the answers by the number of the question. After all correct answers were read aloud to the class by the instructor and answer sheets were graded by their peers in other groups, discussion ensued about the reasoning used by those who selected the correct and/or incorrect answers. This approach was used to aid in student learning and development. The two primary differences in the processing of this collaborative testing was that Class I completed the individual and group testing on the same day as opposed to Class II completing the group testing on the subsequent class meeting. The second difference was that Class I received a hard copy of the exam during the collaboration and Class II used an electronic copy. Both exceptions were made due to cancellation of classes at the southeastern

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university due to weather conditions and the need to complete the process during one class session. Participation or non-participation in the group did not have a negative impact on individual grades of the students. However, students were able to add additional points to their mid-term grade by participating in this collaborative group learning experience. Further, students were not aware at the outset of this experience that additional points could be added because the instructors wanted them to freely express their views.

## **Evaluation**

An evaluation was given to the students to complete individually after the collaborative group testing exercise. Responses were recorded to determine if the exercise achieved the goal of the instructors based on the students' perceived efficacy of working in small groups to foster a deeper level of understanding key concepts covered in class and tested on the midterm exam. The following seven questions were asked immediately following the exercise: 1) How many group members did you have in your group? 2) Prior to this activity, have you ever been allowed to complete a test as a group? 3) Did you find working in a group to be helpful for this activity? 4) Did all members contribute equally? If no, please explain. 5) What did you like the most about this group testing activity? 6) What did you like least about this group testing activity? 7) In your opinion, what was your role in this group activity?

## **Students' Blogs**

Students were given the opportunity to voluntarily blog about their experiences in completing the collaborative group exercise in class. They were instructed to share additional thoughts and observations about the way the exercise was done in class as well as ways to improve it for future students. The instructors of Class I and Class II agreed on and shared the same instructions to students. They were given the following topics to further reflect on while blogging— (1) The presence or absence of leadership in your group, (2) How, if at all, did the exercise help you process the information at a deeper level, (3) What you would have done with additional time for the exercise, (4) How your group arrived at the group answers, (5) Any other pertinent points to the collaborative group testing exercise.

## **RESULTS**

### **Demographics**

There were 33 students in Class I and 22 students in Class II. The college classification of the students in Class I was as follows: 10% freshmen, 57% sophomores, 29% juniors and 5% seniors. One hundred percent of students in the Class I indicated that the class was required. In Class II, students were classified as follows: 28% freshmen, 28% sophomores, 11% juniors, and 28% seniors. Seventy-eight percent of students reported that the class was required of them.

Students were asked to respond to a post activity evaluation after the collaborative group testing exercise. The evaluation was voluntary with 65% of students in Class I and 77% of students in Class II responding to the evaluation. The average group size for both classes consisted of four students. Eighty-one percent of students in Class I vs. 67% in Class II indicated that they had not used collaborative group testing prior to this exercise. In addition, 100% of students in the Class I vs. 89% of students in Class II felt that the activities were helpful.

### **Students' Perceptions of Collaborative Testing**

Students were given the opportunity to respond to open ended questions on an evaluation and later blog about their perceptions of the collaborative effort. Twelve percent of students in Class I and 50% of students in Class II responded to the blog. Five themes were apparent based on the questions asked and responses received from the students. The themes were as follows: (1) group dynamics, (2) perceived benefits, (3) allotted time, (4) group strategies, and (5) future improvements. The following responses including examples from the evaluations, as well as the blog are provided to support these themes.

**Group dynamics.** Specific leadership instructions were not given to students in Class I or Class II but the instructors wanted to know whether a person emerged as a leader of the group. In sum, Class I students commented and/or blogged that they worked well together, helped one another and contributed equally. Regarding the emergence of a group leader, Class II students indicated that the student who had the laptop became the leader and kept the group on track. Class II students shared mixed views on group dynamics. Whereas some students were engaged in their groups' work and efforts to complete the collaborative group test, others were not and minimally contributed to discussions. Overall, Class II students were amenable to working in groups, had a positive

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experience, and felt group members contributed equally. However, when this was not the case (i.e., group member(s) not sufficiently contributing), some feelings of frustration emerged. Some of the specific comments made by students in the evaluation and blog responses were as follows:

There is a strong presence of leadership in our group from all of our members because we are all dedicated to succeeding in the class and want to put forth our full effort into doing well! (Class I blog response)

The group did not have one leader; therefore, I guess that means there was an absence of a leader in our group, but that worked to our advantage. If one of us had a different reasoning for a question, none of us were too shy to step up and explain our point of view on the question and in that way we all took turns leading the question discussion. (Class I blog response)

The leader of the group was subconsciously the person in charge of the laptop. That person set the pace of the test and took charge. (Class II blog response)

I feel that the three girls worked very well together. I don't really know if the boys knew what we were doing or really understood the information. I feel that we all wanted to contribute to the test and tried to. (Class II blog response).

**Perceived Benefits.** Overall, the Class I evaluation and/or blogs indicated an appreciation for being able to discuss responses with peers and to process the information at a deeper level. This is consistent with the Student Involvement theory described by Astin (1984). All of the students in Class I agreed that the exercise was helpful. They appreciated the ability to work with others in the class to hear their thoughts and reasoning and to discuss different concepts learned in class. Others expressed that it was great because of the varied ages and experiences in the class and that it allowed them to share thoughts and perspectives on each question. Students in Class II overwhelmingly perceived the collaborative testing activity beneficial, and even expressed a desire to be allowed to use this testing method in the future. The students' views of the perceived benefits align with previous research, as they expressed current and future benefits of participating in collaborative testing. Students' comments in the blog postings indicate the collaborative testing activity helped them in a variety of ways including: understanding the material, reaching goals, increasing professional skills (e.g., leading, solving

problems, and communication), sharing knowledge and ideas, gaining new perspectives, and offering a chance for redemption. Some students perceived the benefits as giving them a glimpse of their future workplace environments, acknowledging working with individuals from different cultures. Specific comments were made as follows:

We had all the information we each knew on the subject matter, and then combined, we knew more and had a better opportunity to answer the questions and were more confident that we got them right. (Class I evaluation response)

I think that talking it through as a group was very beneficial to all of us because we each had questions about certain topics that we didn't understand, but when we talked it through it made it clearer. (Class I blog response)

We were able to see what we really knew and what confused us... (Class II evaluation response)

The exercise did seem beneficial to the understanding of the content that I missed. It is easier to interact with others who may think about the questions differently than I do. (Class II blog response)

There are a lot of benefits of being one of the group members. However, sharing the ideas and opinions with your group members will help the group to reach their goals easily and save a lot of time. Also, it could help to increase a lot of the professional skills such as leading, solving problems, communication and a lot of skills that could help you while you are in the workplace... (Class II blog response)

**Allotted Time.** The collaborative test was timed; students were allowed 20 minutes to complete the test. Class I collective responses confirmed that enough time was allotted for this exercise. However, additional time would have been beneficial for greater discussion of each question. Students in Class II indicated the need for additional time and stressed how the additional time could have improved the collaborative testing experience. Even though students were given a specific timeframe to collaborate on the test, additional time was used to review the test *as a class after all groups completed*. Students did not consider the time used during the class review of their collaborative efforts as being time allowed to work or engage in the collaborative testing experience. Time was considered by the students to be an element impacting

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the collaborative testing experience. Consequently, Class II students stressed time to be one of the aspects of the collaborative group testing experience *least* liked.

With additional time for the exercise, we would have maybe gone through the tricky questions again and talked through them more. Also we would have discussed what was not on the exam and what we thought would have been good test questions. I think our group would have gone through the questions and picked out which ones were a good measure of how well we learned the material and which ones were not like that. (Class I blog response)

More time could have allowed my group the opportunity to go back over the questions and read them slowly because usually speed reading the questions and answers often leads to careless mistakes. Also, with more time we could have continued our discussions on the few we had answered differently. (Class I blog response)

I think the time allotted was sufficient. (Class I blog response)

...time restraint was pressuring. (Class II evaluation response)

Overall, I feel with that if we would have had more time each one in our group could have processed the information at a deeper level and did better on the test. (Class II blog response)

If I had been provided with a little extra time for the exercise, I would have taken that time to go back through and review each and every question and answer just to make sure that we had read all of the questions correctly and selected the right answer. (Class II blog response)

**Group strategies.** During the collaborative testing activity, groups were not allowed to collaborate with other groups. Therefore, collaborative groups employed various strategies to complete the test. Some groups held brief discussions before giving a final answer, while others approached each question individually then sought agreement on a final answer. Even though some Class II groups may have resorted to the divide and conquer method, some groups simply discussed answer options and eliminated wrong answers. Regardless of the strategy employed by each group, students in Class I consistently indicated the need for consensus or group agreement. Whereas, Class II students highlighted the value of discussions and sharing prior knowledge in their strategy. In addition, the interactions among peers in the group

were also indicated by Class II students to be an element *liked most* about the collaborative group testing experience.

My group members and I just talked through the answers together. We collectively eliminated answers we knew were incorrect, and we had discussion about possible correct answers. (Class I blog response)

The questions that were controversial in terms of differing opinions required looking at each of the options and working together to use the process of elimination which would then lead to consensus for the answer we would choose. (Class I blog response)

Group answers were reached by each person stating what they believed the answer was and why. (Class II blog response)

One of the group members had a good grade on the first test so she explained and helped us understand what we ended up doing wrong... we divide it up each one of us had a chapter... (Class II blog response)

**Future improvements.** Students in both classes provided input on how to improve the collaborative testing experience. Improvement suggestions ranged from transforming the activity to a game to increasing the amount of time to complete the activity. However, pragmatic, constructive suggestions focused on conducting the activity prior to the exam rather than afterwards.

I think this would have been more helpful as a review activity instead of a follow up to the test. (Class I evaluation response)

I think it would have been more helpful to do something similar before the exam (at an earlier date), rather than after. (Class I blog response)

Use as a method of review before an exam (Class II evaluation response)

## **Additional Comments**

When given the opportunity to provide *additional feedback* in the blog regarding their collaborative testing experience, some students in Class I expressed that this exercise would be helpful for other classes. Class I students also reiterated it would have been more helpful to do a similar activity before the exam. Moreover, Class II students reiterated their affinity for the collaborative

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testing experience, the benefits to them, and their preference of collaborative testing over individual testing.

## **DISCUSSION**

This study focused on student perceptions of collaborative group testing strategies utilized in two distinct classes (one in the health sciences and the other in human resource development) at different universities. Accordingly, the instructors endeavored to identify and explain the perceptions of students in introductory classes regarding collaborative testing in class settings with different foci. As students in both Class I and Class II gravitated to the approach and perceived collaborative testing as beneficial to learning, this study supports the finding of Cortright et al. (2003) that students retained course information significantly better when they were able to discuss questions and responses in small groups after taking individual exams (although we did not formally or statistically assess information retention in the present study). Further, the format (collaborative testing completed *after* individual testing) used in the study allowed students to receive timely feedback from peers and the instructor. The importance of timely feedback was also highlighted as important for retention of course content (Cortright et al., 2003), and likewise this format was used in the collaborative testing study of Cortright et al. (2003) wherein the connection to learning and retention was supported with evidence.

Five themes also emerged from student perceptions: (1) group dynamics, (2) perceived benefits, (3) allotted time, (4) group strategies, and (5) future improvements. One should recognize that group dynamics will vary (e.g., gender, leadership skills, cooperation); however, placing strict protocols on the groups may create an unnecessary barrier to groups determining their strategy for communicating and completing the collaborative test. Nevertheless, the benefits perceived by the students (e.g., gaining a perspective on the future work environment, working with and for persons from different cultural backgrounds, use of effective communication strategies) serve as a catalyst and motivator for the instructor and students to engage in the collaborative testing. The allotted time to complete the collaborative test was perceived as somewhat problematic. However, the allotted time should be carefully determined due to the fact that groups must stay on task and avoid getting entangled in discussion not germane to the course content. Group strategies may initially appear to be minor;

nevertheless, this element emerges as a critical component to the success of the group which can greatly impact group dynamics, communication, collaborative testing benefits (outcomes), and time used.

These themes help bring into focus how collaborative testing may be implemented in introductory courses across disciplines, as well as how students can take a more active role in their learning. As asserted by Johnson, et al. (1998), promoting positive interdependence is an essential element in cooperative and collaborative approaches. The future improvements articulated by the students in the study revealed their willingness to further engage in collaborative testing (and learning) in introductory courses and that modifications to the process could yield additional perceived benefits. In summary, these themes provide a deeper understanding of students' perceptions of working collaboratively and communication in groups when an assessment is involved.

## **Implications for Instructors**

Based on prior works of Blumberg (2009) and Weimer (2013), we consider collaborative testing a learner-centered approach. Additionally, this consideration takes into account that a collaborative testing experience can challenge students' self-efficacy. Moreover, we are led to this resolve because the collaborative testing activity permitted students to communicate and engage in work that allowed them to demonstrate success and it was reinforced by teaching that lets students acknowledge their responsibility for learning (Weimer, 2013). Implementing collaborative testing (a learner-centered teaching strategy) requires careful thought and deliberation. As a result, instructors may have to place students' needs in the classroom ahead of their own. Instructors should quickly be made aware of the time commitment and preparation needed to determine their desired collaborative testing. At a minimum they should consider:

- communicative intent (strategies for productive communication of ideas);
- format (e.g., combination group and individual testing, simultaneous individual and group testing, etc.);
- method (e.g., online/electronic, paper, oral, etc.);
- groupings (e.g., ad hoc or fixed; self-selected or instructor-selected); and
- timeframe

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Coupled with regard to the previously listed considerations, instructors are encouraged to evaluate the collaborative testing activity. Doing so will allow the instructor to gain insight into the students' reaction and future planned action. Additionally, insight into students' perceptions of what worked well and what could be improved to aid in their learning experience could also be gained through evaluation. We especially encourage evaluation if the instructor plans to conduct collaborative testing multiple times during the course.

Instructors considering collaborative testing should also consider working with a partner in this endeavor. Partnering with other instructors teaching different sections of the same course, instructors teaching courses at the same level (i.e., introductory courses), or interested colleagues can aid in generating ideas that support effective communication and implementation of collaborative testing. In addition, interdisciplinary partnerships are also encouraged when instructors are able to find common elements in the courses. An example of a common element in the present study was the courses were introductory courses in both disciplines. By partnering with a colleague(s), instructors are able to have synergistic dialogue and support from peers. Partnerships are helpful in classes of all sizes.

## **LIMITATIONS, FUTURE RESEARCH, AND CONCLUDING SUMMARY**

### **Limitations**

Limitations of the study were observed with Class I using a hard copy of the exam while Class II completed the collaborative exercise electronically. Secondly, Class I took the exam on the same date as the collaborative group testing activity while Class II completed the collaborative test on the following class period after the individual test was completed. It is noteworthy that Class I took the exam on the same day only because of weather conditions causing a class session to be cancelled. This, of course, was a necessary modification and beyond the control of the researchers. Even though Class I had more students to participate in the collaborative testing their blog responses were few. The instructors determined that these subtle differences were acceptable though not ideal for analyzing the similarities and differences between the perceptions of the students in Class I and Class II. The most rewarding aspect of this exercise to the instructors was to watch how the students deliberated about answers

and reasoned with one another to defend their perspectives.

### **Future Research**

We fully encourage future research on collaborative testing in introductory courses, primarily to address learning outcomes and to promote best practices among users. Based on the findings of this study, we recommend future research on collaborative testing further examine: a) learning outcomes in introductory courses; b) group dynamics and communication; c) the differences in student perspectives of collaborative testing using different testing methods (i.e., online/electronic, paper, oral, etc.); d) identification of the skills (e.g., communication, leadership, listening, etc.) students perceive collaborative testing helps to build or enhance that will aid in their success in the workplace; and e) how partnering with colleagues can aid instructors in implementing learner-centered approaches (e.g., collaborative testing). As these areas are researched and new knowledge is generated regarding the purpose, significance, and usage of collaborative testing, a greater appreciation for the practice will develop. Consequently, future research in the areas will enhance the practice and better address the learning needs of students and aid instructors in determining efficiencies when implementing collaborative testing. Student success is at the core of collaborative learning strategies and instructor awareness of these perceptions enables them to accomplish the core mission of teaching and learning.

### **Concluding Summary**

This study revealed that students enrolled in the introductory courses expressed highly favorable perceptions of the collaborative group testing process utilized in their respective disciplines. From the students' perspectives in Class I there were no leaders that emerged within the group. Conversely, in Class II, the person with the control of the computer functioned as a leader as they worked together with one person capturing group answers on the computer. Overall, students expressed the positive benefit of sharing ideas and opinions which led to a deeper understanding of the information. In addition, some even cited that they learned to understand and appreciate how their classmates thought through questions. When asked about the amount of time provided to complete the collaborative testing, the majority of the students in both classes indicated that more time would have been helpful. Students in Class I and Class II agreed

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that the exercise would be good to use in other classes and as a review method before an exam.

Although the findings of the current study are not universally generalizable, we conclude that the findings are significant to the practice of teaching and learning. Further, we perceive that this work may inspire educators to inherently seek to include more learner-centered activities in their pedagogy. As the usage of collaborative testing in introductory courses grows, further study can commence examining communicative intent, learning outcomes, and student success.

## REFERENCES

- Allison (n.d.). Group testing-taking options to consider. [Web Blog Comment]. Retrieved from <http://www.facultyfocus.com/articles/teaching-professor-blog/group-testing-taking-options-consider/>
- Astin, A. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, 25(4), 297–308.
- Blumberg, P. (2009). *Developing learner-centered teaching: A practical guide for faculty*. San Francisco, CA: Jossey-Bass.
- Clinton, B. D. & Kohlmeier, J. M. (2005). The effects of group quizzes on performance and motivation to learn: Two experiments in cooperative learning. *Journal of Accounting Education*, 23, 96-116.
- Cortright, R. N., Collins, H. L., Rodenbaugh, D. W., & DiCarlo, S. E. (2003). Student retention of course content is improved by collaborative-group testing. *Advances in Physiology Education*, 27(3), 102-108.
- Davidson, N., & Major, C. H. (2014). Boundary crossings: Cooperative learning, collaborative learning, and problem-based learning. *Journal on Excellence in College Teaching*, 25(3&4), 7-55.
- Derting, T. L., & Ebert-May, D. (2010). Learner-centered inquiry in undergraduate biology: Positive relationships with long-term student achievement. *Life Sciences Education*, 9, 462-472.
- Dressler, W., Matthews, C., & McDown, L. (2009). Collaborative learning: An innovative educational approach. University of Hawaii. Retrieved from <http://www2.hawaii.edu/~dressler/CLbenefits.html>
- Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education*, 7(1). Retrieved from <http://ClassIIholar.lib.vt.edu/ejournals/JTE/v7n1/gokhale.jte-v7n1.html>
- Gubera, C. Aruguete, M. (2013, December). A comparison of collaborative and traditional instruction in higher education. Retrieved from *Social Psychology of Education: An International Journal*, 16(4), 651-659.
- Johnson, D. W., Johnson, R. T., & Smith, K. A. (1998). Cooperative learning returns to college what evidence is there that it works? *Change: The Magazine of Higher Learning*, 30(4), 26-35. DOI: 10.1080/00091389809602629
- Leight, H. Saunders, C. Calkins, R., & Withers, M. (2012). Collaborative testing improves performance but not content retention in a large-enrollment introductory biology class. *Collaborative CBE Life Science Education*, 11(4), 392–401.
- Ley, K., & Hodges, R., & Young, D. (1995). Partner testing. *Research and Teaching in Developmental Education*, 12(1), 23-30.
- Pace, L. (n.d.). Group testing-taking options to consider. [Web Blog Comment]. Retrieved from <http://www.facultyfocus.com/articles/teaching-professor-blog/group-testing-taking-options-consider/>
- Russo, A. & Warren, S. H. (1999). Collaborative test taking. *College Teaching*, 47(1), 18-20.
- Shana (n.d.). Group testing-taking options to consider. [Web Blog Comment]. Retrieved from <http://www.facultyfocus.com/articles/teaching-professor-blog/group-testing-taking-options-consider/>
- Shea, J. H. (1995). Problems with collaborative learning. *Journal of Geological Education*, 43, 306-308.
- Sheridan, J., Byrne, A. C., & Quina, K. (1989). Collaborative learning: Notes from the field. *College Teaching*, 37(2), 49-53.
- Srougi, M. C., Miller, H. B., Witherow, D. S., & Carson, S. (2013). Assessment of a novel group-centered

# *Journal of the National Black Association for Speech-Language and Hearing*

testing scheme in an upper-level undergraduate molecular biotechnology course. *Biochemistry and Molecular Biology Education*, (41)4, 232-241.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Walczyk, J. J., & Ramsey, L. L. (2003). Use of learner-centered instruction in science and mathematics classrooms. *Journal of Research in science Teaching*, 40(6), 566-584.

Weimer, M. (2013). *Learner-centered teaching*. San Francisco, CA: Jossey-Bass.

Weimer, M. (2014, January 15). Group testing-taking options to consider. [Blog Post]. Retrieved from <http://www.facultyfocus.com/articles/teaching-professor-blog/group-testing-taking-options-consider/>.

Wiggs, C. M. (2011). Collaborative testing: Assessing teamwork and critical thinking behaviors in baccalaureate nursing students. *Nurse Education Today*, 31, 279-282.

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## **HOW DO LANGUAGE EXPERIENCE AND PROCESSING SPEED INFLUENCE THE ACQUISITION OF NARROW PHONETIC TRANSCRIPTION?**

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### **ABSTRACT**

Between 2010 and 2014, one-third of undergraduate and graduate students enrolled in Communication Disorders programs in California, Texas, and Florida were culturally and linguistically diverse (CLD). No published studies report on how CLD students acquire phonetic transcription of non-disordered and disordered spoken English, a critical skill for assessing and treating clients with articulation and/or phonological disorders. We tested whether language experience (i.e., monolingual English experience, early Spanish experience) and processing speed predict acquisition of narrow phonetic transcription. In this retrospective exploratory study, self-reported data on transcription accuracy across 15 periods from 44 undergraduates majoring in Communication Disorders were analyzed using growth curve models. For disordered spoken English, early Spanish experience students initially reported significantly lower transcription accuracy rates and grew at a faster rate than their monolingual English peers. The groups did not differ significantly in processing speed. For non-disordered spoken English, neither processing speed nor language experience predicts acquisition. Although narrow transcription of disordered spoken English is difficult for all students, it may tap a speech perception threshold for students with early Spanish experience.

**KEY WORDS:** Phonetics, phonetic transcription, bilingual, speech perception, speech-language pathology students

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## INTRODUCTION

Hispanics comprise 17% of the United States' population (Stepler & Brown, April 19, 2016), with over half residing in California, Texas, and Florida (Brown & Lopez, 2013). In these three states between 2010 and 2014, approximately 37% of undergraduate students and 36% of graduate students enrolled in Communication Disorders (CDIS) programs were members of a culturally and linguistically diverse (CLD) minority group (CAPCSD & ASHA, 2010-2014). All CDIS programs accredited by the American Speech-Language-Hearing Association (ASHA) include coursework in or coverage of the assessment and treatment of articulation and phonological disorders in English (Standards IV-B and IV-C of "the Standards and Implementation Procedures for the Certificate of Clinical Competence in Speech Language Pathology", ASHA, 2014). Phonetic transcription, a visual record of speech sounds using a phonetic writing system such as the International Phonetic Alphabet (IPA) (Shriberg & Kent, 2013; Small, 2015) is required for pre-professional students within either a dedicated course or as a learning module covered in another course (Lesser, 1992).

The small body of phonetic transcription research focuses on monolingual English service providers (Lockart & McLeod, 2013; Robinson, Mahurin, & Justus, 2011), so it does not address how CLD students acquire this skill. We examine whether language experience (i.e., monolingual English experience, early Spanish experience) and processing speed predicts acquisition of phonetic transcription. To explain how our preliminary findings inform clinical education and basic research, we define phonetic transcription and summarize its research basis. We discuss the formation of speech perceptual categories in infancy and we explain why phonetic transcription, though challenging for all students, is particularly challenging for CLD students.

### Phonetic Transcription

Two levels of analysis in phonetic transcription are broad transcription and narrow transcription. While broad transcription is a record of only the phonemes produced by a client, narrow transcription is a record of how the client actually produced the phonemes. Only narrow transcription is able to capture slight differences or allophonic variations in the client's production of a single phoneme because it includes a subset of special symbols

called diacritic markers that describe variations in phoneme production (Duckworth, Allen, Hardcastle, & Ball, 1990; Shriberg & Kent, 2013; Small, 2015). For example, if the client intends to say *dog* [dɔg] but actually produces the [d] speech sound with his tongue against the back of the upper teeth, the clinician will add the dentalization diacritic marker under the [d] to capture this variation [d̪ɔg]. Although narrow transcription is considered to be a much more demanding task than broad transcription (Howard & Heselwood, 2002), it is critical that students master narrow transcription so they can accurately diagnose disordered speech (Duckworth et al., 1990; Howard & Heselwood, 2002; McLeod, Verdon, Bowen, & the International Expert Panel on Multilingual Children's Speech, 2013; Teoh & Chin, 2008).

Knight (2010) summarizes factors affecting phonetic transcription accuracy in terms of Baddeley's (1986) model of working memory. First, the transcriber must receive the speech signal (and possibly the visual signal if the transcription is video-recorded). The speech signal is temporarily stored in the phonological loop—a specialized area in working memory responsible for retaining verbal information through rehearsal for very short periods of time. While the signal is stored in the phonological loop, it is automatically analyzed into segments and compared to representations stored in long-term memory. Once the representations of the signal are retrieved, they are paired with the appropriate IPA symbols so the transcriber can record them. Three issues related to processing speed and working memory that may affect students' accuracy when acquiring phonetic transcription are (a) the ability to inhibit English spelling ('orthographic') conventions, (b) differences in processing speed related to language experience, and (c) the tendency of students to falsely identify phonemes based on the categorical boundaries of their primary language.

Our experience teaching undergraduate students clinical phonetics indicates that, when initially learning to apply IPA symbols during live transcription, many students struggle to inhibit their selection of English spelling conventions in favor of the correct IPA symbols. They particularly struggle with: (a) vowel digraphs (two graphemes that represent one vowel sound) such as in the words *leisure*, *applesauce*, *lassoed*, and *great*, (b) consonant digraphs (two graphemes that represent one consonant sound) such as in the words *Churchill*, *finish*, *laughed*, *phonetics*, *the*, and *Martha*, (c) vowels

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preceding [r] such as in the words *here, sport, hair,* and *are,* (d) the graphemes *g* and *j* that represent the sound [dʒ] such as in the words *judge* and *jelly,* (e) the graphemes *q, x, c, ck,* and *ch* that represent the sound [k] such as in the words *quick, extra, cookie, clack* and *orchestrates,* (f) the grapheme *c* that represents the sound [s] such as in the word *recess,* and (g) the grapheme *y* in initial position that represents the sound [j] such as in the words *yellow* and *yucky.* Although we can find no studies that address whether or how English graphemic interference affects processing speed during narrow transcription, there is extensive evidence from cognitive psychology indicating that participants process information more slowly when they receive stimuli with distracting information than when they do not (see Hommel, 2011).

Another issue that may affect the accuracy of students when acquiring phonetic transcription is processing speed related to language experience. Although processing speed and language experience interact in children and older adults, with bilinguals achieving faster reaction times than monolinguals (Bialystok, Martin, & Viswanathan, 2005), processing speed and language experience do not interact in young adults in their twenties (Kousaie & Phillips, 2012). In fact, undergraduate university students specifically are at the “peak of cognitive efficiency” and no difference between monolingual and bilingual young adults is observed in processing speed as measured by the Simon Task, described later in this study (Bialystok et al., 2005, p. 110). For this reason, we do not hypothesize a difference in processing speed due to language experience.

A third issue that may affect the accuracy of students when acquiring phonetic transcription skill is the tendency of students to falsely identify phonemes based on the categorical boundaries of their primary language. In other words, the transcribers quickly and automatically filter the information they hear through the “phonological sieve” of their language and thus cannot help but misperceive sounds peripheral to their established categorical boundaries (Buckingham & Yule, 1987, p. 118). Existing research indicates that monolingual English students and clinicians tend to misperceive allophonic variations (different ways one phoneme can be spoken) as categorically different phonemes when transcribing disordered speech and speech from a foreign language.

To our knowledge, there have been no published studies that have directly compared the ability of students or professionals in speech language pathology (SLP) to transcribe non-disordered and disordered speech. Given that non-disordered speech does not include phonetic distortions that could cause transcribers to mis-classify a phonetic aberration as a phonemic substitution, we hypothesized that students will achieve higher accuracy rates when transcribing non-disordered speech than when transcribing disordered speech earlier in their phonetics training.

Very little evidence exists on how the SLPs’ language experience affects their ability to transcribe speech from a foreign language. Lockart and McLeod (2013) tested the ability of monolingual English SLP students, who had already been trained in IPA transcription of English, to transcribe Cantonese accurately. The students heard sets of five single syllable words with one set of non-disordered Cantonese spoken by an adult and one set of disordered Cantonese spoken by a child. Students could refer to a standard IPA chart and could replay the audio recordings as many times as they wanted while listening to the word lists. Students correctly transcribed 35% of the words (consonants only) from the adult non-disordered speech and 41% of the words (consonants only) from the child disordered speech. An error analysis showed that students were more likely to transcribe correctly consonants in common between the two languages and more likely to transcribe incorrectly consonants specific to Cantonese or consonants that were transcribed with diacritic markers. Lockart and McLeod (2013) establish that SLP students already trained in IPA achieved higher transcription accuracy on phonemes held in common between their language and the foreign language. Our interest is in how students from CLD backgrounds acquire phonetic transcription skills in English. To explain how false phonemic evaluation might differ based on the language experience of students, we next describe the differences in how the categorical boundaries of phonemes develop in monolingual and bilingual infants and how these differences extend into adulthood.

## **Differences in Monolingual and Bilingual Categorical Boundary Development**

Phonemic category boundaries are different for monolingual and bilingual infants. Bosch and Sebastian-Galles (2003) suggest that 8-month-old bilinguals acquire

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a shared perceptual space for phonemes common to both languages. For example, when presented with non-word minimal pairs based on Catalan that were differentiated by the /e/ and /ɛ/ phonemes, Spanish-Catalan simultaneous bilingual 8-month-olds were less accurate in differentiating the phonemes than Catalan monolingual 8-month-olds, possibly because /e/ and /ɛ/ could be grouped together as one vowel for Spanish speakers.

For simultaneous bilingual infants, this shared perceptual space for phonemes that is common to both languages has consequences for how these infants acquire new phonemes. For example, Fennell and Byers-Heinlein (2014) tested how English monolingual and French-English simultaneous bilingual 17-month-olds learned minimal pairs when the stimuli were presented by English monolingual adults and French-English bilingual adults. The infants learned minimal pairs only when the speakers matched the infants' language learning environment. So, monolingual English infants only learned minimal pairs produced by monolingual speakers and French-English bilingual infants only learned minimal pairs produced by French-English bilingual speakers.

Thus far, we have contrasted the differences in the speech perception categories of monolingual and simultaneous bilingual infants. What about sequential bilinguals who learn a second language later in childhood? Are their phonemic categories more similar to monolinguals or simultaneous bilinguals and do these differences extend into adulthood? It depends upon when the sequential bilinguals acquire their second language.

When sequential bilinguals acquire the second language early in childhood (by age 3 years), they tend to categorize speech sounds similarly to simultaneous bilinguals. For example, early sequential Spanish-Basque bilingual adults performed similarly to Spanish-Basque simultaneous bilingual adults when evaluating whether the second of three non-words had either an apical /s/ or a laminal /s/ that matched the first or third non-word (Larraza, Samuel, & Onederra, 2016). However, when sequential bilinguals do not acquire their second language until they enter school (at age 6), their phonetic boundaries for their first language develop similarly to monolinguals (Antoniou, Tyler, & Best, 2012). For example, on the evaluation of non-words including apical /s/ or laminal /s/, late sequential Spanish-Basque bilinguals, who learned Basque after the age of six years, did not evaluate phonemes as accurately as the

simultaneous and early sequential Spanish-Basque bilinguals. Therefore, the later the individuals learned Basque, the more difficult it was for them to differentiate the two phonemes in Basque (Larraza, et al., 2016).

Thus far, we have discussed the research basis for IPA transcription for clinical purposes, and how early language experience creates distinct phonetic boundaries that persist into adulthood. What about students who acquire a second language later in life? Can they create distinct phonetic boundaries that affect their ability to perceive phonetic boundaries? To answer this question, we turn to Flege's Speech Learning Model (SLM).

The SLM proposes that there is not a critical period for learning speech sounds and individuals have the ability to learn language-specific properties of another language across the lifespan (Flege, 2007). This means that individuals can form new categories for phonemes regardless of the age at which they learn a second language (Flege, 2007). Despite their ability to form new categories for phonemes from a different language, late language learners, in general, do not perceive vowels the same as native speakers of a language. However, some late language learners do learn how to perceive vowels similarly to native speakers of a language if the second language becomes their dominant language (Flege & MacKay, 2004). For example, using an oddity discrimination task in which the participants had to identify which vowel within nonsense words was unlike the others, Flege and MacKay (2004) found that adult English-Italian bilinguals who learned Italian early and used English later in life but within an educational setting perceived the English vowels /ɒ / vs /ʌ/, /ɛ/ vs /a/, /i/ vs /ɪ/ similarly to native speakers of English. These results suggest that CLD students educated in the United States in the process of acquiring IPA in a clinical phonetics class might achieve similar transcription accuracy rates as monolingual English students. However, one must remember that clinical phonetic transcription, particularly of disordered speech, is a much more complex task than an oddity discrimination task when participants simply have to determine which phoneme of a set is different from the others. To understand how task complexity might affect perception of category boundaries, we turn to Strange's (2011) Automatic Selective Perception Model (ASP).

## **The Automatic Selective Perception Model**

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The ASP model explains how the speech perception of adult non-native and second language learners (L2) is affected by stimulus complexity and task demands (Strange, 2011). Therefore, the ASP model describes speech perception of a very different population than CLD students enrolled in a clinical phonetics class who have matriculated in school systems that use English for instructional purposes. We turn to this model because it is the only model of speech perception that allows for the complex stimuli and task demands inherent in phonetic transcription of non-disordered and disordered speech.

In the ASP model, speech perception is conceptualized as a set of over-learned selective perception routines (SPRs) that “constitute mastery of phonological procedural knowledge” (p. 47). The ASP model also includes two modes of speech perception: the phonological mode and the phonetic mode. Adult listeners automatically access the phonological mode of their L1 when processing continuous speech. They access the phonetic mode when processing detailed allophonic information (such as the minimal pairs often used in speech perception discrimination tasks), particularly when learning a new language. Accessing the phonetic mode is less automatic and taxes cognitive resources. Adult L2 listeners gradually develop SPRs for the second language. When task demands are low, adult L2 listeners are able to make categorical discriminations of phonemes and allophones in the second language. However, when task demands are high, both non-native and adult L2 listeners, fall back on their over-learned L1 SPRs, which can cause them to falsely evaluate many phonemes in the second language. These false phonemic evaluations are most likely to occur when the adult L2 listener is processing non-native segments or segments that occur in both languages but are produced differently (Strange, 2011).

Although the ASP model does not address how early language experience of bilinguals effects their perception of spoken English, we suspect that (a) Spanish-English simultaneous bilinguals maintain strong SPRs for the shared phonemic perceptual space they acquired in infancy and that (b) early Spanish-English sequential bilinguals will maintain strong SPRs for Spanish. Also, because narrow phonetic transcription is a demanding perceptual task, we think it may activate the overlearned dominant language SPRs in Spanish-English simultaneous bilinguals and early sequential bilinguals. For this reason, we grouped Spanish-English simultaneous bilinguals and early sequential bilinguals

together in our study. Going forward, we refer to these two groups as students with early Spanish experience. Therefore, we are extending for descriptive purposes the ASP model to a new population, students with early Spanish experience, and to two new complex speech perception tasks, narrow phonetic transcription of non-disordered and disordered speech.

We view narrow phonetic transcription as essentially a speech perception task. We predicted that students with monolingual English experience will demonstrate higher levels of transcription accuracy initially and across time than students with early Spanish experience because of how the speech perception categories are formed in development. We also predicted that differences in the acquisition of phonetic transcription based on language experience would be more pronounced when the students transcribed disordered spoken English than when they transcribed non-disordered spoken English.

## **Summary and Research Questions**

For all students, acquiring narrow phonetic transcription in English is a challenging task because they have to quickly process the speech signal while overcoming the distractions of (a) English orthographic spelling conventions and (b) the tendency to process phonetic distortions as phonemic substitutions. Our experience teaching phonetics suggests that some students are better at overcoming these distractions than others, particularly early in the phonetics course. Secondary evidence from cognitive psychology suggests that tasks with distracting information reduce processing speed (see Hommel, 2011). Students with early Spanish experience may face an additional challenge. Evidence suggests that they, at least initially, formed different phonemic category boundaries than their monolingual English peers. However, evidence from Flege and MacKay’s (2004) phonemic discrimination tasks suggests that early Spanish experience students may perceive English phonemic category boundaries similarly to their monolingual English peers. Our experience teaching clinical phonetics suggests that the complexity of the task may cause these early Spanish experience students to draw on the phonemic category boundaries they formed early in life. Support for this possibility comes from Strange’s (2011) ASP model.

Thus, the purpose of this study was to test whether language experience (i.e., monolingual English experience, early Spanish experience) and processing

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speed predicts acquisition of narrow phonetic transcription ability in undergraduates when they transcribe *non-disordered* and *disordered* speech. For each data set, we asked the following question:

For undergraduate students learning to transcribe spoken English, will language experience (i.e., early monolingual English experience, early Spanish experience) or processing speed predict growth rates in narrow phonetic transcription at the word-level?

For both types of speech (non-disordered and disordered), we predicted that both processing speed and language experience would predict initial differences in transcription accuracy but only language experience would predict growth rates in transcription accuracy, with the early monolingual English experience group surpassing the early Spanish experience group. We also predicted that the effect would be larger for transcription of disordered speech because disordered speech often contains distorted sounds.

## **METHODS**

We conducted a preliminary retrospective exploratory study of self-reported transcription ratings for 15 time periods collected during an undergraduate clinical phonetics course. The original purpose of this data was to track two student learning outcomes over the course of one semester for accreditation through the Southern Association of Colleges and Schools (SACS). The learning outcomes were:

- Transcribe normal child and adult speech with 90% accuracy as measured by inter-scorer reliability (2014 ASHA Certification Standard IVB: Basic Human Communication Processes)
- Transcribe disordered child and adult speech with 90% accuracy as measured by inter-scorer reliability (2014 ASHA Certification Standard IVC: Articulation and Phonology)

Anecdotal evidence from class discussions and office hour meetings with monolingual English students and bilingual English-Spanish students suggested two error patterns. First, regardless of language experience, many students made transcription errors because they used English orthographic spelling conventions instead of IPA symbols. Second, many Spanish-English bilingual students made transcription errors because of phonemic interference from Spanish. In a very initial effort to discover whether the anecdotal evidence is in fact patterns

in the data, we conducted this retrospective exploratory study.

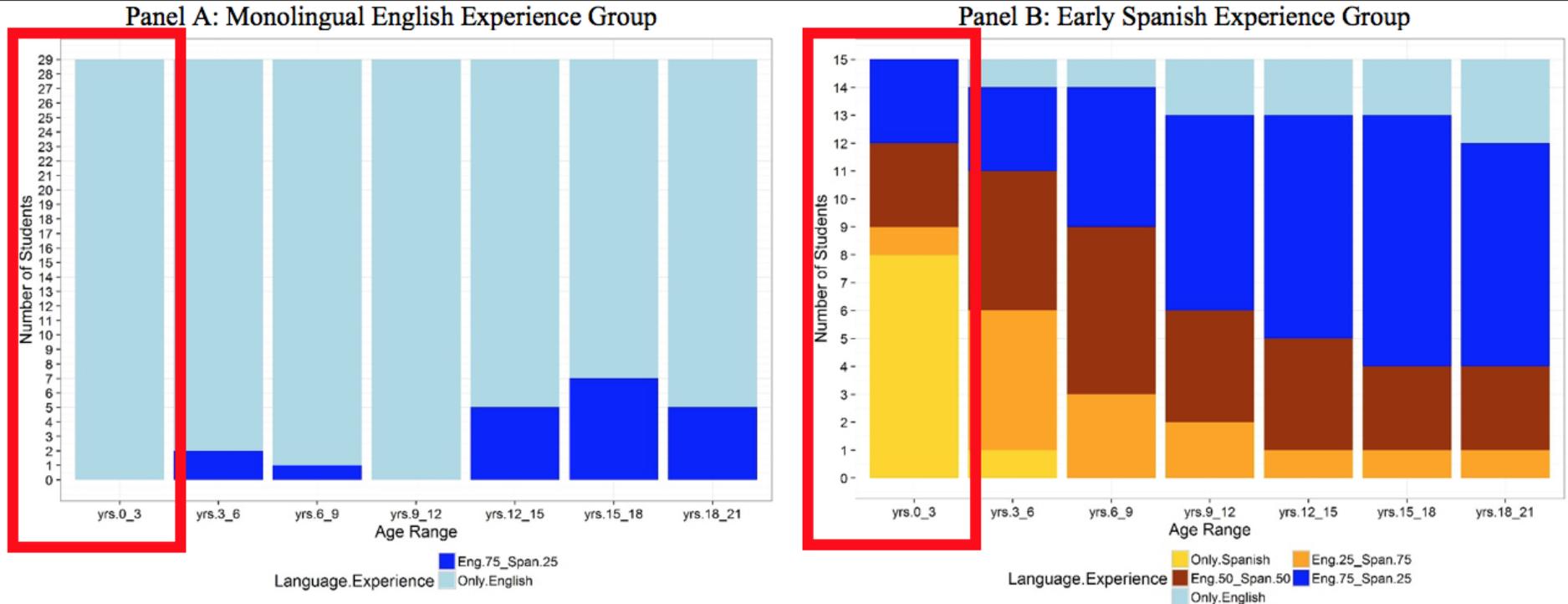
## **Participants**

Forty-seven upper-division undergraduate students ( $M = 22$  years, 2 male) majoring in Communication Disorders at a public university participated in this study. Three students were excluded because of hearing loss (two students) and prior knowledge of IPA (one student). To determine language use and proficiency, participants completed an adult language-use questionnaire (Kiran, Pena, Bedore, & Sheng, 2014). Spanish was the only other language these participants listed. Given that phonetic transcription is essentially a listening activity, we focused on the participants' receptive language abilities to determine the language experience groups. Participants who heard only English between birth and 3-years old were classified as the monolingual English experience group ( $n = 29$ ,  $M = 21.96$  years,  $SD = 2.97$  years). Participants who heard only Spanish or heard a combination of Spanish and English between birth and 3-years old were classified as the early Spanish experience group ( $n = 15$ ,  $M = 20.87$  years,  $SD = 1.19$  years, 1 male). Figure 1 graphs the composition of languages the participants heard most of the time from birth through age 21. Note that the language experience groups used in this study are based on the students' language experience in the first column marked by the red box (birth to 3 years). Given that the students were 18 years or older when enrolled in the phonetics course, we wanted to show how their language experience had changed over time as well as their language experience during the phonetics course.

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**Figure 1.**

**The composition of languages most heard across time by students in the monolingual English experience group (Panel A) and the early Spanish experience group (Panel B) during a 14-week undergraduate phonetics course.**



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For the Monolingual English group, Figure 1 shows that English was the language they mostly heard from birth through early adulthood. For the early Spanish experience group, Figure 1 shows that although they received a large amount of Spanish input from birth to 3 years of age, they received a large amount of English input as young adults.

To estimate the participants' processing speed when faced with distracting information, we used an online version of the Simon Task (Stoet, 2010) that the students took on their personal computers at the end of the course. In this task, participants saw a series of left-pointing arrows and right-pointing arrows presented on a computer screen. Participants were instructed to immediately press the "A" key on the keyboard when they saw left-pointing arrows and the "L" key when they saw right-pointing arrows. The placement of the arrows on either the left-hand side or right-hand side of the computer screen determined whether the information was distracting. When the placement of the arrow on the computer screen (e.g., left-hand side) matched the direction of the arrow (e.g., left-pointing arrow), the trial did not include distracting information. However, when the placement of the arrow on the computer screen (e.g., left-hand side) was different from the direction of the arrow (e.g., right-pointing arrow), the trial included distracting information. Participants tend to complete trials with distracting information more slowly than trials with non-distracting information (Hommel, 2011). For this study, processing speed for each student is the average response time for distracting information less the average response time for non-distracting information ( $M = 40.20$  ms,  $SD = 34.08$  ms, low = -24.98 ms, high = 127.33 ms).

## **Stimuli**

The stimuli (see the appendix) were 150 sentences, with 75 non-disordered ( $M = 3.38$  words, min = 1 word, max = 6 words) and 75 disordered sentences ( $M = 3.83$  words, min = 1 word, max = 5 words). The stimuli were created to highlight different aspects of transcription that were important to instruction. Note that the stimuli were not created in a controlled fashion and no systematic effort was made to control for difficulty level of the sentences across the 15 time periods. Although a weakness in our study, we believe the stimuli are adequate to explore, in a very preliminary fashion, whether the anecdotal evidence of differences in language experience and processing

speed describe student transcription accuracy rates when acquiring the skill.

Our interest was in capturing participants' word-level accuracy when transcribing casual continuous speech at the sentence level. This type of speech contains phonetic words, which do not conform to orthographic word boundaries (Shriberg & Kent, 2013). We defined word boundaries according to natural pauses in continuous speech. In other words, two or more words could be transcribed as one phonetic unit (Shriberg & Kent, 2013). For example, *the table*, would be transcribed as it is actually said in continuous speech:

[ðətēɪbəl]

An example of non-disordered speech stimuli is the sentence *I can go running*, which when said was transcribed narrowly as [aɪ kəŋgəʊ rʌnɪŋ]. An example of disordered speech stimuli is the sentence *Sam sure is surly*, which when said was transcribed as:

[s æm s ʒɪz s ʒɪl]

The diacritic marker used in the last example indicates that the speaker produced a whistling sound on the voiceless and voiced lingua-alveolar fricative consonants.

We conducted two post hoc descriptive analyses of the stimuli. In our first post-hoc analysis of the stimuli, we used Cummings (1998) and our own experience teaching phonetics to select English orthographic spelling conventions that were most likely to interfere with the acquisition of phonetic transcription. We estimated that English orthographic spelling conventions could interfere with the correct phonetic transcription of 22% of the phonemes in the non-disordered sentences and 25% of the phonemes in the disordered sentences. Vowel digraphs (e.g., *leisure*) and r-colored vowels (e.g., *here*) occurred in 10% of phonemes in the non-disordered and 10% of phonemes in disordered sentences. Consonant digraphs (e.g., *Churchill*) occurred in 7% of phonemes in the non-disordered and 10% of phonemes in disordered sentences. The remaining possible English orthographic intrusions were (a) the graphemes *g* and *j* that represent the sound [dʒ] (e.g., *judge*), (b) the graphemes *q*, *x*, *c*, *ck*, and *ch* that represent the sound [k] (e.g., *quick*), (c) the grapheme *c* that represents the sound [s] (e.g., *recess*), (d) the grapheme *y* in initial position that represents the sound [j]

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(e.g., yellow). These remaining intrusions occurred in 5% of non-disordered and 3% of disordered sentences.

In our second post-hoc analysis, we analyzed which vowel and consonant sounds in Spanish might have interfered with the students' ability to transcribe English, thus increasing the likelihood that the early Spanish experience students would falsely evaluate phonemes. Monophthongs that are present in English but absent in Spanish ([ɪ, ε, æ, ʊ, ʌ, ə, ɜ, ɝ]) occurred in 67% of the non-disordered and 61% of the disordered speech stimuli. The diphthongs that are present in English and absent in Spanish ([aɪ, əʊ, ɔɪ]; see Bauman-Waengler, 2012) occurred in 40% of the non-disordered and 27% of the disordered speech stimuli. Consonants that are present in English but absent in Spanish ([v, z, ð, θ, ʃ, ʒ, ʒʃ]; see Bauman-Waengler, 2012) occurred in 40% of the non-disordered and 24% of the disordered speech stimuli. Consonants that are alveolarized in English and dentalized in Spanish ([t, d, n]; see Bauman-Waengler, 2012) occurred in 66% of the non-disordered and 40% of the disordered speech stimuli. The [ŋ] consonant, which is velarized in English and palatalized in Spanish (see Bauman-Waengler, 2012), occurred in 5% of the non-disordered and disordered speech stimuli. The [tʃ] consonant, which has variable pronunciation in Spanish (see Bauman-Waengler, 2012), occurred in 3% of the non-disordered and 2% of the disordered speech stimuli. The diacritics used were:

- unreleased stop (intended [læp] but said [læp̚])
- nasalization (intended [bæd] but said [bæ̃ d])
- lengthening (intended [si] but said [si:] )
- syllabification (intended [fɪŋ] but said [fɪŋ<sub>1</sub> ])
- rising terminal juncture ([tʊdɛɪ<sub>+</sub>])
- dentalization (intended [widθ] but said [wid<sub>̣</sub> θ])
- palatalization intended [sil] but said [s<sub>j</sub> il])
- lateralization (intended [slip] but said [s<sub>̣</sub> lip])
- whistle (intended [si] but said [s<sub>ʷ</sub> i])

For non-disordered speech, only unreleased stop, pronounced nasalization, lengthening, syllabification, and rising terminal juncture occurred and had a frequency ranging from 2% to 5%. For disordered speech, all the diacritics except rising terminal juncture occurred with pronounced nasalization (12%) and lengthening (14%) occurring with the greatest frequency. The remaining diacritics occurred with a frequency ranging from 2% to 7%.

## **Procedure**

The phonetics class met bi-weekly for lecture for one hour and 20 minutes for 20 class periods and included a one-hour weekly transcription lab. Data were collected during 15 class periods of the lecture portion of the class beginning on the first day. The course instructor (first author) was the examiner. At the beginning of classes when data were collected, participants were instructed to only have a blank sheet of paper and a writing utensil in front of them. They were also instructed to narrowly transcribe the sentences spoken by the examiner. The examiner's voice was amplified using the built-in microphone attached to the podium that was positioned at the front of the classroom. The participants heard two blocks of sentences, with non-disordered sentences always preceding disordered sentences. Each sentence was said four times with a 15-second pause between sentences.

After transcribing all of the sentences, participants were shown the correct transcription for the 10 sentences that included the total number of phonemes, words, and diacritic markers for each sentence and for each block of sentences (i.e., non-disordered, disordered). Although there was no formal transcription instruction while the students corrected their transcriptions, the examiner answered any questions they had about transcription patterns they thought they saw in the sentences. To correctly transcribe a word, the word had to include: (a) all of the correct vowels and consonants, (b) the correct word boundary, and (c) the correct diacritic marker(s). Additionally, the sentence in which the words occurred had to be enclosed by square brackets to indicate narrow transcription. Each participant calculated his or her proportion of correctly transcribed words for both non-disordered and disordered sentences and entered those proportions on an excel spreadsheet that was submitted at the end of the semester. Importantly, the students were reminded regularly that they were not being graded on the

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accuracy of their transcription during these assignments and, therefore, had no incentive to inflate their self-graded scores. Students were encouraged to identify error patterns in their transcriptions to help them know where to invest their study time.

## **Data Analysis Plan**

We conducted growth curve analysis (a.k.a., multi-level modeling of time course data; Mirman, 2014) to test whether processing speed and/or language experience predicted the accuracy of narrow phonetic transcription over time at the word level for non-disordered and disordered speech. We selected growth curve analysis instead of traditional methods for repeated measures analysis (e.g., repeated measures analysis of variance, multivariate analysis of variance, raw and residual change scores) because growth curve analysis is particularly well-suited for data sets with partially missing data, unequally spaced time points, and complex non-linear trajectories (Curran, Obeidat, & Losardo, 2010).

The basic assumptions of growth curve modeling depend upon the complexity of the design, the number of nested variables, the number of participants, and the number of repeated measures. Our design was simple with only one nesting relationship (time) so having 44 participants was adequate to model change across time (see Curran et al., 2010). Our design included 15 repeated measure data points per participant, which surpasses the minimum requirement of three repeated measures per participant (see Curran et al., 2010). Growth curve modeling assumes that (a) the individual growth trajectories based on the residuals reflect the hypothesized growth pattern (i.e., functional form assumption), (b) the residuals for the whole data set and for any experimental groups are normally distributed (i.e., normality assumption), and (c)

the residuals for the experimental groups have equal variance (i.e., homoscedasticity assumption, Singer & Willett, 2003). Following Singer and Willett (2003), we checked the assumptions of growth curve modeling for each data set twice, first for the initial model that best described change over time without predictors and then for the final growth curve model that best explained the data sets when predictors were added to the models.

In models that included the language experience groups, the early Spanish experience group was treated as the reference category and parameters were estimated for the monolingual English experience group. In models that included either or both predictors (i.e., language experience, processing speed), the models also included random effects of participants on all time terms. The fixed effects of language experience (categorical variable) and processing speed (continuous variable) were evaluated using model comparisons. Improvements in model fit were evaluated using -2 times the change in log-likelihood, which is distributed as chi square with degrees of freedom equal to the number of parameters added. All analyses were carried out in R version 3.2.3 using the lme4 package version 1.1-11.

## **RESULTS**

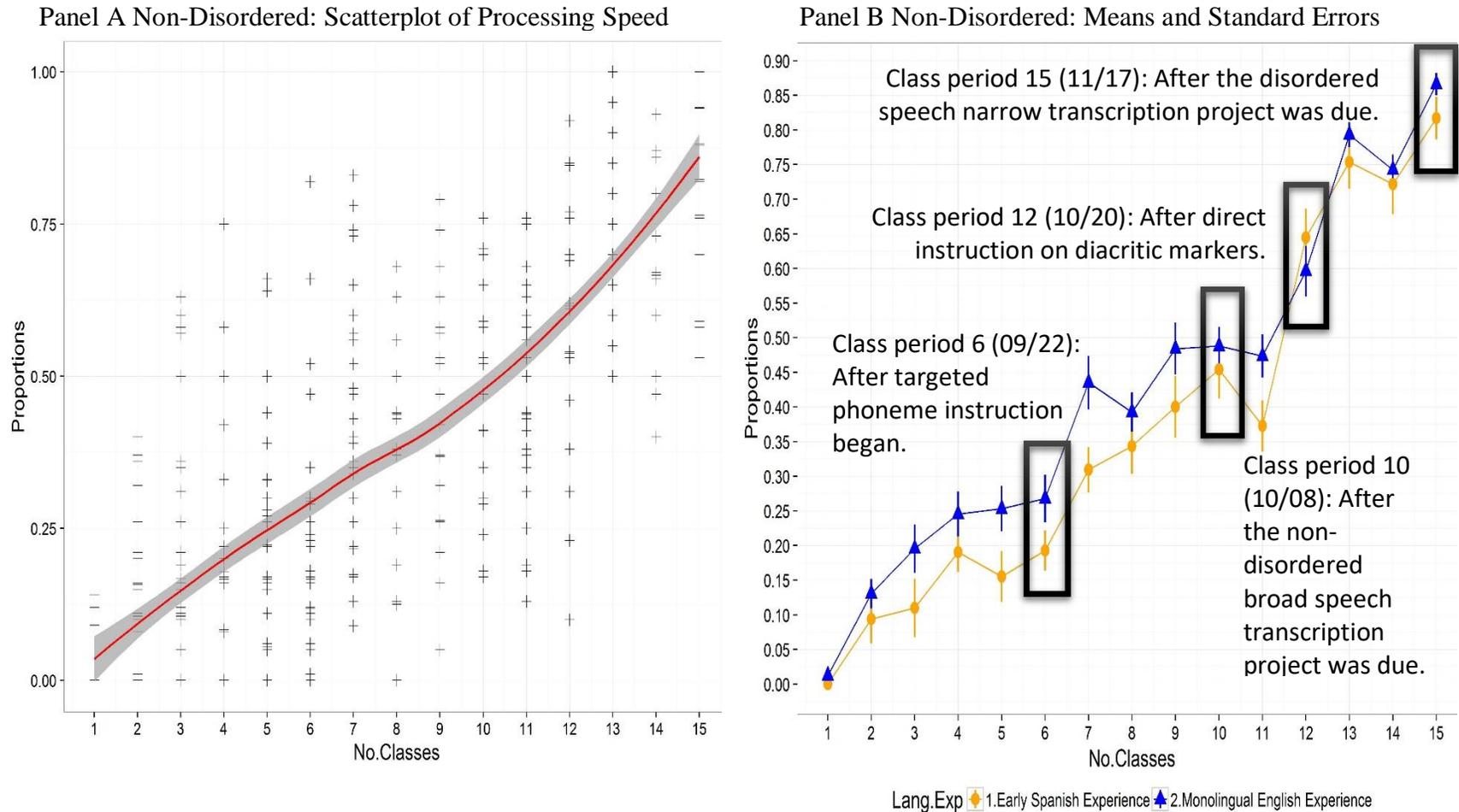
### **Transcription of Non-Disordered Speech**

**Descriptive statistics.** Panel A of Figure 2 displays a scatter plot of the participants' mean proportion of transcription accuracy against processing speed when presented with distracting information. Table 1 displays the means and standard deviations for the proportion of accurately transcribed English words across all time points for the non-disordered spoken English stimuli.

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**Figure 2.**

**Descriptive statistics for phonetic transcription of non-disordered speech for processing speed (Panel A) and language experience (Panel B) during a 14-week undergraduate phonetics course.**



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**Table 1.**

**Descriptive statistics for the proportion of accurately transcribed English words within sentences spoken with non-disordered speech.**

	Aug.27	Sept.03	Sept.08	Sept.10	Sept.15	Sept.22	Sept.24	Sept.29	Oct.01	Oct.06	Oct.13	Oct.27	Oct.29	Nov.03	Nov.17
<hr/>															
Monolingual English Experience Group															
Mean	0.01	0.13	0.20	0.25	0.25	0.27	0.44	0.39	0.48	0.49	0.47	0.60	0.79	0.74	0.87
SD	0.04	0.11	0.19	0.17	0.17	0.19	0.21	0.15	0.20	0.15	0.16	0.19	0.10	0.11	0.09
Minimum	0.00	0.00	0.00	0.00	0.05	0.05	0.09	0.00	0.05	0.17	0.13	0.10	0.60	0.47	0.53
Maximum	0.14	0.40	0.63	0.75	0.66	0.82	0.83	0.68	0.79	0.76	0.76	0.92	1.00	0.93	1.00
<hr/>															
Early Spanish Experience Group															
Mean	0.00	0.09	0.11	0.19	0.16	0.19	0.31	0.34	0.40	0.45	0.37	0.64	0.75	0.72	0.82
SD	0.00	0.14	0.16	0.11	0.14	0.11	0.13	0.16	0.17	0.16	0.14	0.16	0.14	0.17	0.12
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.13	0.21	0.18	0.18	0.31	0.50	0.40	0.58
Maximum	0.00	0.37	0.57	0.33	0.50	0.35	0.48	0.68	0.63	0.71	0.60	0.85	0.95	0.93	1.00

*Note.* SD = standard deviation

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The spread among data points and the shape of the regression line in Panel A of Figure 2 suggests: (a) a positive gradient with larger accuracy rates associated with higher processing speeds, (b) a basic linear shape, and (c) a weak association between transcription accuracy and processing speed because of how disperse the data points are in relation to the regression line. Panel B of Figure 2 displays the participants' mean proportion and standard error of transcription accuracy for the two language experience groups. The annotations in Panel B indicate the class period that occurred after key class lectures and assignments were due. Both groups were unable to accurately transcribe phonetically at the word level on the first day of class. Beginning the second class period, differences in the proportion of accurate phonetic transcription emerged. Students in the monolingual English experience group consistently reported higher proportions than students in the early Spanish experience group for the next 10 class periods (August 29<sup>th</sup> to October 13<sup>th</sup>) in which data were collected. During the last four class periods in which data was collected (October 27<sup>th</sup>, 29<sup>th</sup>, November 3<sup>rd</sup>, and 17<sup>th</sup>), the two groups of students generally reported similar proportions of accurate transcription.

**Growth curve analysis.** Linear and curvilinear growth curves were initially conducted to determine which type of curve best fit the data when no predictors were added. These initial models indicated that linear growth best described the non-disordered data set.

**Assumptions and initial models.** For both the initial linear model and the final linear models, the individual growth trajectories based on the residuals demonstrated upward growth. The residuals for both models were not normally distributed, but instead were left skewed. This is not surprising given that all students scored at least one zero at the beginning of data collection. When the model included language experience as a predictor, the residuals of the language experience groups had equal variance.

When processing speed was added to the model, the effect did not improve model fit  $X^2(1) = 1.60, p = .21$ . When the effect of processing speed was additionally allowed to effect growth rate, there was no significant effect on the growth rate (i.e., linear term,  $X^2(1) = 0.18, p = .67$ ). When language experience was added to the model, the effect also did not improve model fit  $X^2(1) = 2.88, p = .09$  and did not have a significant effect on the growth rate (i.e., linear term,  $X^2(1) = 0.43, p = .51$ ). In other words, neither processing speed nor language experience predicted student's acquisition of phonetic transcription at the word level when narrowly transcribing non-disordered speech.

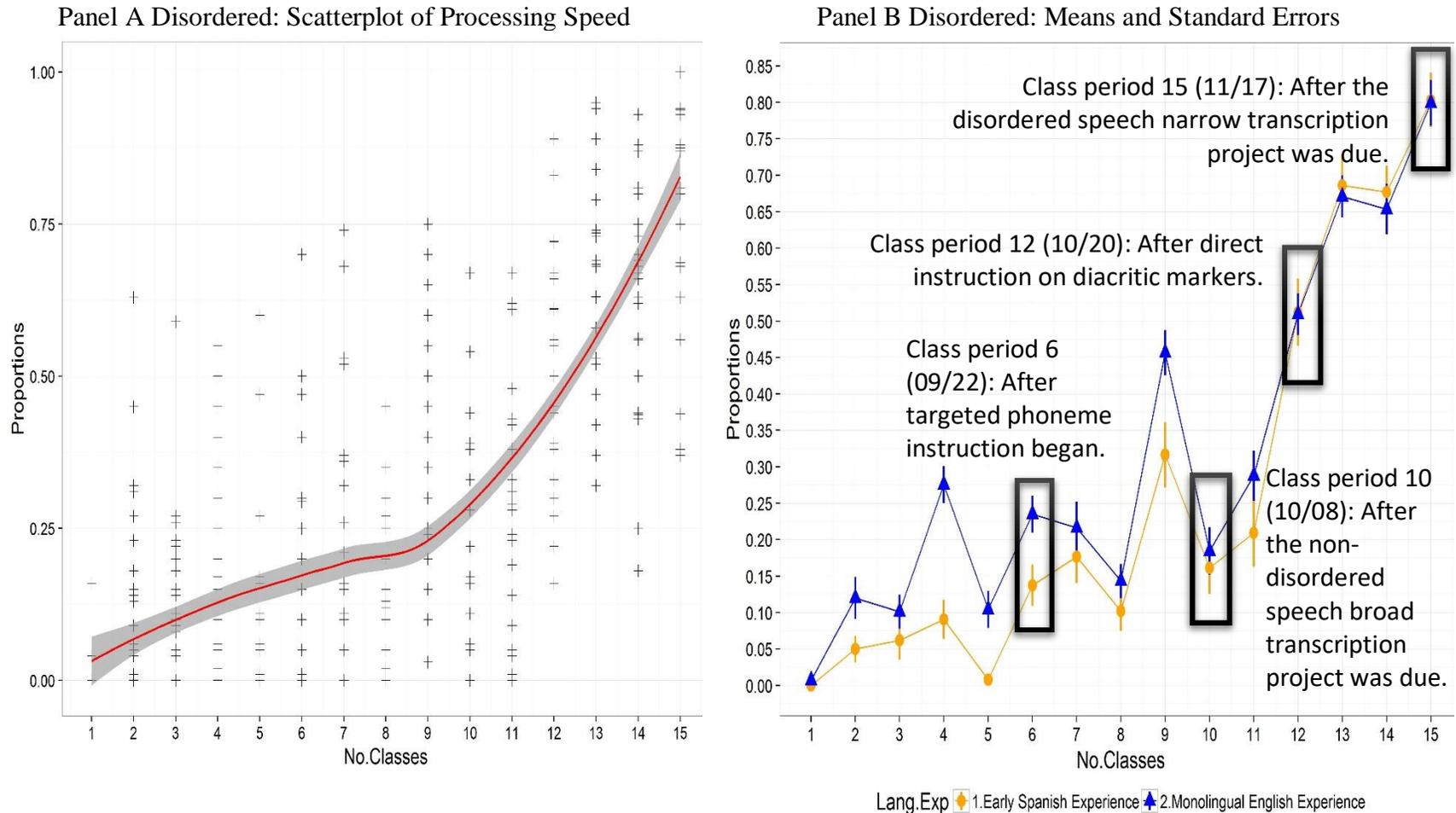
## **Transcription of Disordered Speech**

**Descriptive statistics.** Panel A of Figure 3 displays a scatter plot of the participants' mean proportion of transcription accuracy against processing speed when presented with distracting information. Table 2 displays the means and standard deviations for the proportion of accurately transcribed English words across all time points for the disordered spoken English stimuli.

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**Figure 3.**

**Descriptive statistics for phonetic transcription of disordered speech for processing speed (Panel A) and language experience (Panel B) during a 14-week undergraduate phonetics course.**



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**Table 2.**  
**Descriptive statistics for the proportion of accurately transcribed English words within sentences spoken with disordered speech.**

	Aug.27	Sept.03	Sept.08	Sept.10	Sept.15	Sept.22	Sept.24	Sept.29	Oct.01	Oct.06	Oct.13	Oct.27	Oct.29	Nov.03	Nov.17
<hr/> Monolingual English Experience Group <hr/>															
Mean	0.01	0.12	0.10	0.28	0.10	0.23	0.22	0.14	0.46	0.18	0.29	0.51	0.67	0.65	0.80
SD	0.03	0.15	0.12	0.14	0.14	0.14	0.19	0.13	0.17	0.18	0.18	0.15	0.15	0.18	0.17
Minimum	0.00	0.00	0.00	0.02	0.00	0.05	0.00	0.00	0.10	0.00	0.00	0.16	0.37	0.18	0.37
Maximum	0.16	0.63	0.59	0.55	0.60	0.70	0.74	0.45	0.75	0.67	0.67	0.89	0.94	0.88	0.94
<hr/> Early Spanish Experience Group <hr/>															
Mean	0.00	0.05	0.06	0.09	0.01	0.14	0.18	0.10	0.32	0.16	0.21	0.51	0.69	0.68	0.80
SD	0.00	0.07	0.10	0.10	0.02	0.11	0.14	0.10	0.17	0.14	0.18	0.18	0.16	0.14	0.14
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.22	0.32	0.44	0.44
Maximum	0.00	0.27	0.27	0.30	0.06	0.30	0.53	0.30	0.60	0.39	0.62	0.83	0.95	0.93	1.00

*Note.* SD = standard deviation

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The spread among data points and the shape of the regression line in Panel A of Figure 3 suggests: (a) a positive gradient with larger accuracy rates associated with higher processing speeds, (b) a curvilinear shape, and (c) a weak association between transcription accuracy and processing speed because of how disperse the data points are in relation to the regression line. Panel B of Figure 3 displays the participants' mean proportion and standard error of transcription accuracy for the two language experience groups. As with the non-disordered speech data, group differences emerged beginning the second class period with students in the monolingual English experience group reporting higher proportions of transcription accuracy for the next 10 class periods. During the last four class periods in which data were collected, students in both language experience groups reported similar proportions of accurate transcription.

**Growth curve analysis.** Initial linear and curvilinear models indicated that curvilinear growth best described the disordered data set.

**Assumptions and initial models.** For both the initial curvilinear model and the final curvilinear models, the individual growth trajectories based on the residuals

demonstrated upward growth. The residuals for both models were not normally distributed, but instead were left skewed. When the model included language experience as a predictor, the residuals of the language experience groups had equal variance. When predictors were added to the model, the effect of processing speed did not improve model fit  $X^2(1) = 0.35, p = .55$ . When the effect of processing speed was additionally allowed to effect growth rate, there was no significant effect on the growth rate (i.e., linear term,  $X^2(2) = 0.46, p = .80$ ).

**Final model.** The effect of language experience did improve model fit  $X^2(1) = 5.83, p = .016, R^2 = .76$ . When the effect of language experience was additionally allowed to effect growth rate, there was an effect approaching but not achieving significance on the growth rate (i.e., curvilinear term,  $X^2(2) = 5.60, p = .061, R^2 = .76$ ). Table 3 shows the fixed effect parameter estimates and their standard errors along with  $p$ -values estimated using the normal approximation for the  $t$ -values for both models.

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**Table 3.**

**Parameter estimates for analysis of effect of processing speed on undergraduate students' ability to phonetically transcribe disordered speech at the word-level.**

	Estimates	Standard Error	<i>T</i>	<i>p</i>
Language experience: $X^2(1) = 5.83, p = .016, R^2 = .76$				
Intercept	0.262	0.019	13.657	.000
Linear slope: Number of classes (No.Classes)	0.827	0.031	26.903	.000
Curvilinear slope: Number of classes	0.289	0.027	10.790	.000
Intercept: Monolingual English Experience	0.059	0.022	2.632	.008
Language experience and growth over time: $X^2(2) = 5.60, p = .061, R^2 = .76$				
Intercept	0.265	0.021	12.655	.000
Linear slope: Number of classes (No.Classes)	0.892	0.051	17.447	.000
Curvilinear slope: Number of classes	0.360	0.041	8.167	.000
Intercept: Monolingual English Experience	0.054	0.026	2.084	.043
Linear slope x Monolingual English Experience	-0.986	0.063	-1.567	.123
Curvilinear slope x Monolingual English Experience	-0.109	0.054	-2.002	.050

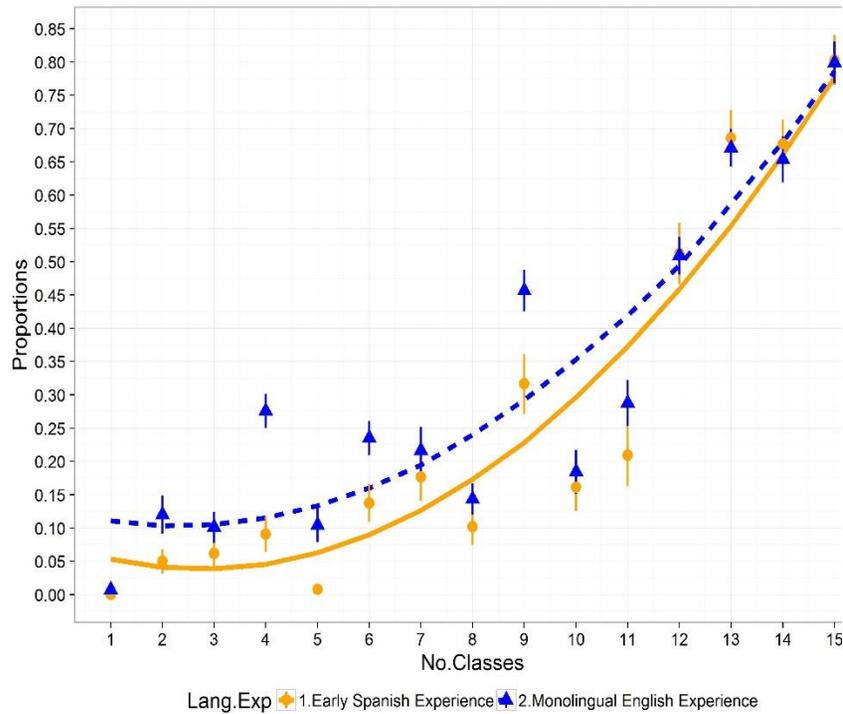
In both models, the monolingual English experience group reported higher transcription accuracy rates than the early Spanish experience group. In the model approaching significance, the early Spanish experience group grew in transcription accuracy at a faster rate than the monolingual English group. Figure 4 displays the curvilinear growth model that included only language experience as a predictor (Panel A) and the curvilinear growth model that allowed language experience to effect growth over time (Panel B).

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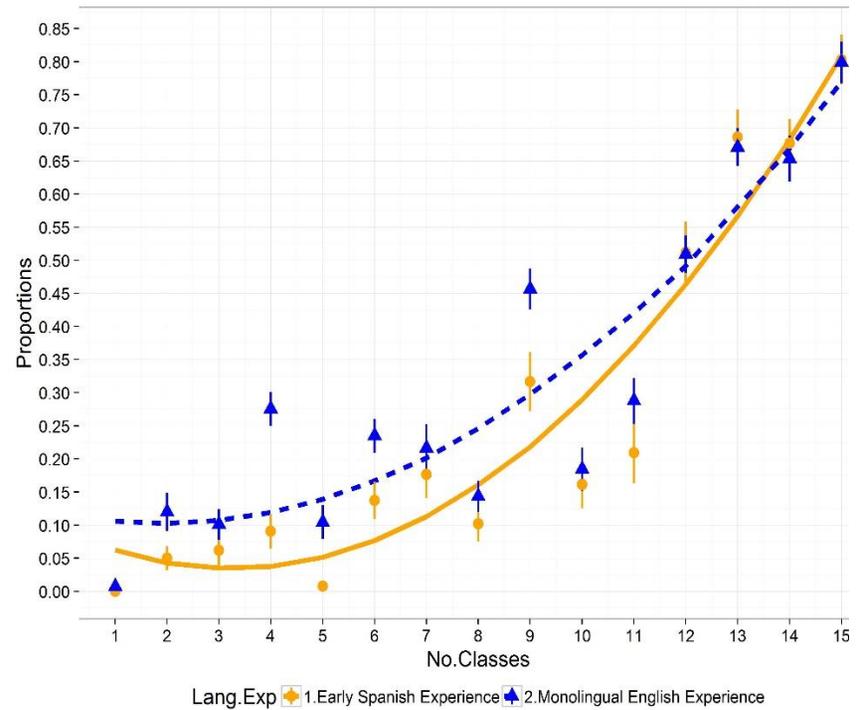
**Figure 4**

**Curvilinear model of the effect of language experience (Panel A) and the interaction between language experience and time (Panel B) on the acquisition of phonetic transcription skills of disordered speech during a 14-week undergraduate phonetics course.**

Panel A: Language Experience Improved Model Fit  
 $X^2(1) = 5.83, p = .016, R^2 = .76$



Panel B: Language Experience & Time Improved Model Fit  
 $X^2(2) = 5.60, p = .061, R^2 = .76$



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## **DISCUSSION**

We conducted a preliminary retrospective exploratory study of the acquisition of clinical phonetic transcription as part of an undergraduate course in Communication Disorders. We predicted that both processing speed and language experience would affect the accuracy of phonetic transcription initially but that only language experience would predict growth over time. Specifically, we predicted students with monolingual English experience would achieve higher transcription accuracy rates than students with early Spanish experience at the beginning of the course and that students with early Spanish experience would grow at a faster rate in transcription accuracy during the course than their monolingual English peers. We also predicted that the effect would be more pronounced for the transcription of disordered speech than for non-disordered speech. For the transcription of disordered speech, only language experience predicted transcription accuracy at the beginning of the course ( $p = .016$ ) and over time ( $p = .061$ ). At the beginning of the course, students with monolingual English experience achieved higher transcription accuracy rates than students with early Spanish experience. Over time, students with early Spanish experience grew in transcription accuracy at a faster rate than students with monolingual English experience, suggesting that students in the early Spanish experience group had to work harder than their peers to reach the same level of transcription accuracy by the end of the course. For the transcription of non-disordered speech, neither processing speed nor language experience predicted transcription accuracy.

### **Clinical and Potential Theoretical Importance**

These preliminary findings have both practical and potential theoretical implications. The practical implications concern the teaching of phonetics. Instructors of clinical phonetics courses need to be aware of the extra challenges in speech perception facing students with early Spanish experience when initially learning to narrowly transcribe disordered speech. We suggest that students who are learning phonetic transcription not receive grades on live transcription of disordered speech when the unit of analysis is word-level accuracy within sentences until the last few weeks of the course. Given that our students with early Spanish experience overcame their initial speech perception differences by the end of a 14-week course, we do not see

a need for targeted intervention for these students. To create an equitable learning environment between students with early Spanish experience and those with monolingual English experience enrolled in our 14-week course, we plan to make students with early Spanish experience aware of the similarities and differences between English phonology and Spanish phonology at the beginning of the course and encourage them to include minimal pairs practice for sounds that are present in English but absent in Spanish. However, if the phonetics course is a 6-week or 9-week course, we strongly suggest providing students with early Spanish experience a minimal pairs intervention that focuses on differences between English and Spanish phonologies.

The potential theoretical implications are best viewed within Strange's (2011) ASP model of second language acquisition, which we used only for descriptive purposes in our study. We suspect that when narrowly transcribing non-disordered English speech, all students were able to draw on the selective perception routines (SPRs) in procedural memory for processing English phonology. We also suspect that when narrowly transcribing disordered English speech, monolingual English students continued to draw on the same selective perception routines for processing English phonology while the early Spanish experience students did not. We suspect that the task of narrowly transcribing disordered speech was so taxing at the beginning of the course that early Spanish experience students automatically reverted to the SPRs they acquired in infancy. For the simultaneous bilingual students ( $N = 8$ ) in the early Spanish experience group, these SPRs are likely based on the shared phonemic perceptual space of Spanish and English (see Bosch & Sebastian-Galles, 2003). For the early sequential Spanish-English bilinguals ( $N = 7$ ) in the early Spanish experience group, these SPRs are likely based on Spanish. Accessing the Spanish and Spanish-influenced SPRs would lead the early Spanish experience students to make more false phonemic evaluations than they would have if they were still accessing routines for English phonology.

### **Study Limitations**

There are three main limitations to our study. First, students took the Simon Task at the end of the phonetics course. We do not think that acquiring phonetic transcription skill or mastery will reduce reaction times on the Simon Task because phonetic transcription is essentially an auditory task, not a visual one (see Soetens,

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Maetens, & Zeischka, 2010 for results of how visual tasks reduce reaction times on the Simon Task). Second, our students heard each sentence four times while transcribing. We do not believe the repetition increased the students' accuracy rates because Knight (2010) found that transcription accuracy did not increase until undergraduate students heard the stimuli six to 10 times. Third, we would have needed to include an error analysis of each student's transcriptions to demonstrate unequivocally that the early Spanish experience group made false phonemic evaluations when transcribing disordered Spoken English.

## **Future Studies**

Based on population surveys for the United States, there has been a 47% increase in the number of people speaking languages other than English in the home since the 1990s (U.S. Census Bureau, 2000) and 21% (out of 291 million) of people age 5 years and older speaking a language other than English in the home (Ryan, 2013). It is inevitable that the linguistic diversity of students in our field and of the clients we serve will continue to expand. Our retrospective study only explored how early Spanish language experience influenced the acquisition of phonetic transcription of spoken English. Will the effects we found hold true for other languages and when English is not the target transcription language? Will our students need more advanced clinical phonetics training to develop the perceptual acumen needed to judge whether a mispronounced sound is a distortion or a false phonemic evaluation across different languages? Given these unanswered questions and the increasing linguistic diversity of the United States, we propose that the acquisition of phonetic transcription across languages be a separate line of research. We think Strange's (2011) Automatic Selective Perception (ASP) model of second language acquisition, which we used only for descriptive purposes, should be experimentally extended to include the acquisition of phonetic transcription across language experience groups.

## **Conclusion**

Factors that predict students' acquisition of narrow phonetic transcription vary based upon the type of spoken English they are transcribing. Language experience predicts acquisition of narrow transcription skills for disordered spoken English. It is critical for students to be competent at narrow phonetic transcription so they can accurately assess and diagnose articulation and

phonological disorders (e.g., Duckworth et al., 1990; Howard & Heselwood, 2002; McLeod et al., 2013; Teoh & Chin, 2008). By framing narrow phonetic transcription within the ASP model, we can begin to understand how the complex relationship between different types of language experience, stimulus complexity, and task demands impact the students' perception of spoken English.

## **REFERENCES**

- American Speech-Language-Hearing Association (ASHA). (2014). Standards and implementation procedures for the certificate of clinical competence in speech-language pathology. Retrieved May 7, 2016, from <http://www.asha.org/Certification/2014-Speech-Language-Pathology-Certification-Standards/>
- Antoniou, M., Tyler, M. D., & Best, C. T. (2012). Two ways to listen: Do L2-dominant bilinguals perceive stop voicing according to language mode? *Journal of Phonetics*, 40, 582-594. doi: 10.1016/j.wocn.2012.05.005
- Baddeley, A. D. (1986). *Working memory*. Oxford: Clarendon Press.
- Baddeley, A. D., Gathercole, S., & Papagno, C. (1998). The phonological loop as a language learning device. *Psychological Review*, 105, 158-173.
- Bauman-Waengler, J. (2012). *Articulatory and phonological impairments: A clinical focus* (4th ed.). Boston, MA: Allyn & Bacon.
- Bialystok, E., Martin, M. M., & Viswanathan, M. (2005). Bilingualism across the lifespan: The rise and fall of inhibitory control. *International Journal of Bilingualism*, 9, 103-119.
- Bosch, L. & Sebastian-Galles, N. (2003). Simultaneous bilingualism and the perception of a language-specific vowel contrast in the first year of life. *Language and Speech*, 46, 217-243. doi: 10.1177/00238309030460020801
- Brown, A., & Lopez, M. H. (August 29, 2013). Ranking Latino populations in the states. Pew Research Center Hispanic Trends. Retrieved May 6, 2016, 2016, from <http://www.pewhispanic.org/2013/08/29/ii-ranking-latino-populations-in-the-states/>

# *Journal of the National Black Association for Speech-Language and Hearing*

- Buckingham, H. W., & Yule, G. (1987). Phonemic false evaluation: Theoretical and clinical aspects. *Clinical Linguistics & Phonetics*, 1, 113-125.
- Burns, T. C., Yoshida, K. A., Hill, K., & Werker, J. F. (2007). The development of phonetic representations in bilingual and monolingual infants. *Applied Psycholinguistics*, 28, 455-474.
- CAPCSO & ASHA. (2010-2014). CSD education survey: California aggregate Data Report. Retrieved May 6, 2016, 2016, from <http://www.asha.org/>
- CAPCSO & ASHA. (2010-2014). CSD education survey: Florida aggregate data report. Retrieved May 6, 2016, 2016, from <http://www.asha.org/>
- CAPCSO, & ASHA. (2010-2014). CSD education survey: Texas aggregate data report. Retrieved May 6, 2016, 2016, from <http://www.asha.org/>
- Cummings, D. W. (1988). *American English spelling: An informal description*. Baltimore, MD: John Hopkins University Press.
- Curran, P. J., Obeidat, K., & Losardo, D. (2010). Twelve frequently asked questions about growth curve modeling. *Journal of Cognitive Development*, 11, 121-136. doi: 10.1080/15248371003699969
- Duckworth, M., Allen, G., Hardcastle, W., & Ball, M. (1990). Extensions to the International Phonetic Alphabet for the transcription of atypical speech. *Clinical Linguistics & Phonetics*, 4, 273-280.
- Fennell, C., & Byers-Heinlein, K. (2014). You sound like mommy: Bilingual and monolingual infants learn words best from speakers typical of their language environments. *International Journal of Behavioral Development*, 38, 309-316.
- Flege, J. E. (2007). Language contact in bilingualism: Phonetic system interaction. In J. Cole & J. Hualde (Eds.), *Laboratory phonology 9* (pp. 353-380). Berlin, DE: Mouton de Gruyter.
- Hommel, B. (2011). The Simon Effect as tool and heuristic. *Acta Psychologica*, 136, 189-202. doi: 10.1016/j.actpsy.2010.04.011
- Howard, S. J., & Heselwood, B. C. (2002). Learning and teaching phonetic transcription for clinical purposes. *Clinical Linguistics & Phonetics*, 16, 371-401.
- Kiran, S., Peña, E., Bedore, L., & Sheng, L. (2010). Evaluating the relationship between category generation and language use and proficiency. Paper presented at the Donostia Workshop on Neurobilingualism, San Sebastian, Spain.
- Knight, R. (2010). Transcribing nonsense words: The effect of numbers of voices and repetitions. *Clinical Linguistics & Phonetics*, 24, 473-484. doi: 10.3109/02699200903491267
- Kousaie, S., & Phillips, N. (2012). Conflict monitoring and resolution: Are two languages better than one? Evidence from reaction time and event-related brain potentials. *Brain Research*, 1446, 71-90. doi: 10.1016/j.brainres.2012.01.052
- Larrazza, S., Samuel, A. G., & Oñederra, M. L. (2016, March 10). Listening to accented speech in a second language: First language and age of acquisition effects. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. Advance online publication. doi: 10.1037/xlm0000252
- Lesser, R. (1992). The making of logopedists: An international survey. *Folia Phoniatrica*, 44, 105-125.
- Lockart, R., & McLeod, S. (2013). Factors that enhance English-speaking speech-language pathologists' transcription of Cantonese-speaking children's consonants. *American Journal of Speech-Language Pathology*, 22, 523-539.
- Flege, J. E., & MacKay, I. (2004). Perceiving vowels in a second language. *Studies in Second Language Acquisition*, 26, 1-34. doi: 10.1017/S0272263104261010
- McLeod, S., Verdon, S., Bowen, C., & the International Expert Panel on Multilingual Children's Speech. (2013). International aspirations for speech-language pathologists' practice with multilingual children with speech sound disorders: Development of a position paper. *Journal of Communication Disorders*, 46, 375-387. doi: 10.1016/j.jcomdis.2013.04.003
- Mirman, D. (2014). *Growth curve analysis and visualization using R*. Boca Raton, FL: CRC Press.
- Robinson, G.C., Mahurin, S.L., & Justus, B. (2011). Difficulties in learning phonetic transcription: Phonemic awareness screening for beginning speech-

# *Journal of the National Black Association for Speech-Language and Hearing*

- language pathology students. *Contemporary Issues in Communication Sciences and Disorders*, 38, 87-95.
- Ryan, C. (2013). Language use in the United States: 2011 (American Community Survey Reports ACS-22). Washington, DC: US Census Bureau. <https://www.census.gov/prod/2013pubs/acs-22.pdf>
- Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York, NY: Oxford University Press.
- Shriberg, & Kent. (2013). *Clinical phonetics* (4th ed.). Boston, MA: Allyn & Bacon.
- Small, L. (2015). *Fundamentals of phonetics: A practical guide for students* (4th ed.). Boston, MA: Pearson.
- Soetens, E., Maetens, K., & Zeischka, P. (2010). Practice-induced and sequential modulations of the Simon effect. *Attention, Perception, & Psychophysics*, 72, 895-911. doi: 10.3758/APP.72.4.895
- Stepler, R., & Brown, A. (April 19, 2016). Statistical portrait of Hispanics in the United States. *Pew Research Center Hispanic Trends*. Retrieved May 6, 2016, from <http://www.pewhispanic.org/2016/04/19/statistical-portrait-of-hispanics-in-the-united-states-key-charts/>
- Stoet, G. (2010). PsyToolkit - A software package for programming psychological experiments using Linux. *Behavior Research Methods*, 42(4), 1096-1104.
- Strange, W. (2011). Automatic selective perception (ASP) of first and second language speech: A working model. *Journal of Phonetics*, 39, 456-466. doi: 10.1016/j.wocn.2010.09.001
- Teoh, A. P., & Chin, S. B. (2008). Transcribing the speech of children with cochlear implants: Clinical application of narrow phonetic transcriptions. *American Journal of Speech-Language Pathology*, 18, 388-401.
- U. S. Census Bureau. (2000). *Summary Social, Economic, and Housing Characteristics: Allegany County, N.Y.* Retrieved September 16, 2016, from <https://www.census.gov/prod/cen2000/phc3-us-pt1.pdf>

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## Appendix

### Stimuli Sentences for Non-Disordered and Disordered Speech Used in this Study

Date, Type of Speech, & Orthographic Transcription of Intended Sentences	Narrow Phonetic Transcription of the Spoken Sentences
<hr/>	
August 27 <sup>th</sup>	
<hr/>	
Non-Disordered Speech Sentences	
The cat and the fiddle.	[ðəkæ̃ t æ̃ n ðəfɪd  ]
The cow jumped over the moon.	[ðəkə̃ dʒʌmpt ɔ̃və ðəmun]
The little dog laughed.	[ðəlɪr  dɔg læ̃ ft]
To see such sport.	[təsi sʌtʃ spɔrt]
And the dish ran away with the spoon.	[æ̃ nðə dɪʃ ræ̃ nəwēɪ wɪθðəspun]
Disordered Speech Sentences	
I called my mom on the telephone.	[āɪkʌd māmɑ a ðətəfɒn]
I saw sally	[āɪ s, a s, ælɪ]
Give me the scissors	[gɪb mɪ tə dɪdəz]
Her baby is nice.	[hɑ bāɪbɪ ɪ nāɪ]
Her needs are vast	[hɜ neds ɑr bæst]
<hr/>	
September 3 <sup>rd</sup>	
<hr/>	
Non-Disordered Speech Sentences	
I love geometric shapes.	[āɪ lʌv dʒɪəmetrɪk ʃēɪps]
I can go swimming.	[āɪ kəngōv swɪmɪŋ]
They decided to study.	[ðēɪ dəsāɪdəd tə stʌdɪ]
What's your major now?	[wʌts jɜ mēɪdʒɜ nāv:ʔ]
Gummy bears are poison.	[gʌmɪ be:z ɑ: pɔɪzən]
Disordered Speech Sentences	

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Those boys are nice.	[dɔ̄ʊz bɔ̄ʊz ə nɒs̩]
She eats pink jelly beans.	[ʃ i: its kiŋk ʒ ɛli bims]
Bring me the box please.	[brɪŋ i: gə gaks gliz]
Stop tickling me.	[dɒp dɪklɪŋg mi]
He is chewing corn.	[hi ɪs̩ ʃ uɪŋ kɔ̄r̩]

September 8<sup>th</sup>

## Non-Disordered Speech Sentences

Bring me a burger and fries.	[brɪŋmi əbɜːgə ænd fr̩ɪz]
My cousin is on vacation.	[māi kʌzɪn ɪzən vekēɪʃən]
Never put a bikini on a cat.	[nevə put əbɪkɪni ənəkæt]
Measuring cups are expensive.	[meɜːʒɪŋ kʌps ɑː ɛkspensɪv]
What choices do I have?	[wʌt tʃɔɪsəz duɑi hæv]

## Disordered Speech Sentences

We both got a green pin.	[wiwɔ̄ darə twɪpɪn]
Those boys each have feathers.	[tɔ̄ bɔ̄ i hæ dɛdɜː]
They had a bake sale.	[ðēɪ hædə bēɪk dēɪ]
Gus whistled for his horse.	[gʌ wɪə fɔː hi hɔː]
Trains and planes move fast.	[twēɪnz ænd pwēɪnz muv məst]

September 10<sup>th</sup>

## Non-Disordered Speech Sentences

Find sanctuary.	[fāɪnd sæŋkʃuəri]
He isn't here.	[hiːzn̩ hɪr]
Polly wants a cracker.	[pɒli wʌnts ə krækə]

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He's not a murderer. [hiznət əmɜːdɜːə]

Today is Wednesday. [tədeɪ ɪz wɪnzdeɪ]

## Disordered Speech Sentences

Get up and get dressed. [gɛʔ ʌp æĩŋgɛʔ gwɛst]

Cheese and pickles please. [tʃiz æn pɪkʌz piz]

I do for myself. [aɪ dɔʊ fɔʊ mɑɪ sɛʊf]

I play with toys. [aɪ pʰweɪ wɪf tɔɪz]

Climb the ladder. [kʰlɑɪm ðə mædɜː]

September 15<sup>th</sup>

## Non-Disordered Speech Sentences

The apple core was spoiled. [ðəæpəl kɔr wʌz spɔɪld]

I poured over my notes. [aɪpɔrd oʊvə məɪnoʊts]

Eleven times three is thirty-three. [ɛlevən tɑɪmz θri ɪzθɜːri θri]

Don't judge my mulching. [dɔʊnt dʒʌdʒ məɪmlʌtʃɪŋ]

The kitten ran under the table. [ðækɪtɪn ræn ʌndə ðətēɪbl̩]

## Disordered Speech Sentences

Listen to Red Ridinghood. [lɪʔn̩ wɛ̃ wɑɪ̃ ʔɪŋhʊ]

Wolf appears as grandma. [wʌ əpɪː æ̃ wæ̃mə]

He eats the girl up. [hɪ̃ ɪts̩ ətɜː ʌtʰ]

The lumberjack slices his stomach. [əlʌmɜːæ̃ p s̩ əs̩ ɪs̩ hɪtəɪtʰ]

The ship has already sailed. [tæʃ ɪp hæz ɔlredɪ s̩ eɪld]

September 22<sup>nd</sup>

## Non-Disordered Speech Sentences

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My dad gave me a dollar.	[māɪdæd geɪvmɪ ədɔlə]
Jesse swapped it for chicklets.	[dʒɛsɪ swaptɪt fɔrtʃɪklɪts]
I want a quartz watch.	[aɪ wʌnə kwɔrts wɔtʃ]
No blubbing in phonetics.	[nɔʊ blɒbɪŋg ɪn fənɛtɪks]
He orchestrates covert operations.	[hi ɔrkəstrets kəʊvət əpəreɪʃənz]

## Disordered Speech Sentences

Hello yellow bear.	[hɛ:əʊ jɛ:əʊ be:]
I think that one's best.	[eɪ tɪŋk dæ:dwɛnz dɛt]
Bad dog bit my mouth.	[bæ: dɔ:k ɪt ma maʊf]
Oh, that is a kitty.	[əʊ dæ: ɪ ətɪrɪ]
He has a brown collar.	[hi hæ æbɔʊən təwə]

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September 24<sup>th</sup>

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## Non-Disordered Speech Sentences

That grocery boy annoys me.	[ðæt grəʊɪbɔɪ ənɔɪz mi]
Mockingbirds attack cats.	[mɔkɪŋbɔ:dz ətæk kæts]
Put the baby in the cradle.	[pʊt ðəbeɪbɪ ɪn ðəkrɛɪdl̩]
One more ladle of soup.	[wʌn mɔr leɪdl̩ əv sʊp plɪz]
Her hair has really grown.	[hɜ her hæz rɪli grəʊn]

## Disordered Speech Sentences

Sally sat by the shore.	[s æli s æt baɪðə ʃ ɔr]
Tuesday was yesterday.	[t u d eɪ wɔz jɛs əd eɪ]
Jan's toothache is throbbing.	[dʒænz tuːθeɪ k ɪ z fə bɪŋ]

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Riley runs really fast. [wāīwī wʌnz wiwī fæf]

We play next Saturday. [wi pēī nekʃ s̩ j ætəjēī]

September 29<sup>th</sup>

## Non-Disordered Speech Sentences

Put the horses in the stable. [put ðəhɔrsəz ɪn ðəstēɪbəl]

What time is it? [wʌrtāīm ɪzɪt]

Give me some moisturizer. [gɪmɪ sʌm mɔɪstəraɪzə]

My ear is infected. [māī ɪr ɪzɪnfektəd]

That cupcake is stale. [ðæt kʌpkēɪk ɪz steɪ]

## Disordered Speech Sentences

Mable cried all night. [mēī bɪ kɾāī : ā : nāī :]

Sam fell sick today. [s æm s̩ ɪlz̩ s̩ ɪk t̩ ud̩ ēī]

Someday I'll go soon. [s ʌms̩ ēī āī s̩ ōv̩ s̩ u]

Come here collie now. [kʌ hɪ: kʌjɪ kāv:]

My mother knows you. [bāī bʌ ðə bōv̩ z̩ ju]

October 1<sup>st</sup>

## Non-Disordered Speech Sentences

Yellow jello is yucky. [jɛlōv̩ dʒɛlōv̩ ɪz jʌkɪ]

Churchill ruled England. [tʃɜtʃɪl ruɪd ɪŋɡlɛnd]

Chimpanzees eat bananas. [tʃɪmpænzɪz ɪt bənæneɪz]

Sleeping is my leisure activity. [slɪpɪŋ ɪzmāī lɪzə æktɪvɪtɪ]

Sean ate mutton with jelly. [ʃan ēɪt mʌtŋ wɪθ dʒɛlɪ]

## Disordered Speech Sentences

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Cut the carrots and pears.	[tʌt ðə te:əts ænd te:z]
Timmy tattles too much.	[kɪkɪ kæk  z ku kʌtʃ]
Sisi lives on industrial.	[sɪ sɪ ɪ lɪvz an ɪndʌsɪ triəl]
Get orange lollipops.	[jet ɔ:æntʃ ɔ:lɒpɒps]
Let's eat at Applebees.	[ɛ i æ æpɪri]

October 6<sup>th</sup>

## Non-Disordered Speech Sentences

My garage is big and beige.	[mɑ̃i gərəʒ ɪz bɪg ænd beɪʒ]
Martha flew to Seattle.	[mɑ:θə flu tu siærl]
Did you finish?	[dɪdʒu fɪnɪʃ]
Welcome to the profession.	[welkəm tu ðəprəfeʃən]
Texas State University.	[teksəs steɪt unɪvɜ:sɪtɪ]

## Disordered Speech Sentences

Sam sure is surly.	[s æm s ʒ ɪz s ʒli]
My matches are new.	[bɑ̃i bæ tʃəs a: b̃u]
Insufficient closure.	[ɪ n sə fɪ ʃə nt kl̃oʊ zə]
Those cost fifty pounds.	[ð̃ oʊz̃ kɑ̃s̃ fɪfθ̃ ɪ pɑ̃ʊnz̃]
Out darn spot.	[ʌt da:n s̃ pʌt]

October 13<sup>th</sup>

## Non-Disordered Speech Sentences

Your gloves are on the stove.	[jɔ:rglɒvz ɑrən ðəstəʊv]
You're making an assumption.	[jəmeɪkɪŋ ænəsʌmʃən]
Sherlock just ate cheese.	[ʃə'lək dʒʌst eɪt tʃi:z]

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The ring on my pogo stick broke. [ðəriŋ anmāi pōŋgōŋ stɪk brōŋk]

Sit crisscross applesauce. [sɪtʰ krɪskrasæp| sas]

## Disordered Speech Sentences

Yellow stop sign fall. [jɛjōŋ tapʰ s\_j āɪn s\_j a]

You left your car in the yard. [jələft jəka: ɪndə ja:d]

The policeman came to school today. [ðəpəlɪs\_mən kēɪm t\_u s\_ vl t\_u d\_ ēɪ]

Five more cookies please. [fāĩ mō : kũ kĩ pĩ ]

On Wednesdays, I swim. [an wenz\_ ēɪz\_ āɪ s\_ wɪm]

October 27<sup>th</sup>

## Non-Disordered Speech Sentences

I went to the battle. [āɪ wentu ðəbærl ]

You saw war games? [ju: sa wɔrgēɪmzʰ]

Where's the fire? [wɛrz ðəfāɪə]

Have you decided to transcribe? [hævju dəsāɪrəd tutrænskraɪbʰ]

Sing me a new song. [sɪŋmi: ənusəŋ]

## Disordered Speech Sentences

Did you hear the fog horn? [dujə hɪ: fəfa hɔ:ʰ]

Southside Sandwich shop is great. [s\_j āŋθs\_j āɪd s\_j ænwɪtʃapʰ ɪz\_ gɛt]

I don't know why. [āĩ dōvnt dōũ : dāĩ :]

The Miami dolphins won. [ðəmēamɪ dalfɪz wɹ:]

Don't lick the sticker. [dōŋn nɪ nəɪɪrə]

October 29<sup>th</sup>

## Non-Disordered Speech Sentences

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Rowdy Ryan rode the horse. [rɑ̃ʊdi rɑ̃iɪn rɔ̃ʊd ðəhɔ̃rs]

Ricardo lassoed the bull. [riˌkɑ̃rdɔ̃ʊ læsɔd ðəbʊl]

Come to the barrel races. [kʌm tuðə bærl̩ rēɪsəz]

Let's meet at Bee Cave Road. [lets miˌræt biˌkeɪv rɔ̃ʊd]

You brought me presents? [ju brɔt mi prɛsənts]

## Disordered Speech Sentences

Put the ship inside. [pʊt ðəʃɪp ɪnsaɪd]

Sam scored six points. [s æm s kɔrd s ɪks pɔɪnts]

Thomas lost his saddle. [t əməs lɔs hɪs s ær l̩]

Should they shut it? [ʃʊd ðeɪ ʃʌt ɪt]

Susie knitted a silver scarf. [s ʊs ɪ nɪtɪd əs ɪlvə s kɑrf]

November 3<sup>rd</sup>

## Non-Disordered Speech Sentences

Take exit 240. [teɪk ɛksɪt tuˌfɔrɪ]

Walmart didn't have it. [wɔlma:t dɪn hævɪt]

I hate eggplant. [aɪheɪt ɛɡplænt]

Roadrunners jump on my roof. [rɔ̃ʊdrʌnəz dʒʌmp ɔnmɑɪ rʊf]

I need new tires. [aɪnɪd nu tɑɪəz]

[aɪnɪd nu tɑɪjəz]

[aɪnɪd nu tɑɪəz]

## Disordered Speech Sentences

They played bingo. [ðeɪ peɪ bɪŋɡəʊ]

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Peter Rabbit is coming.	[pɪrə: wæbɪt ɪz kʌmɪŋ]
Summer is over.	[sʌmə: ɪz oʊvə:]
She's a craggy old bat.	[ʃi zə krægi oʊld bæ t]
Sean ate applesauce.	[ʃan eɪt æpl sɔs]

November 17<sup>th</sup>

## Non-Disordered Speech Sentences

I hate round shapes.	[aɪ heɪt raʊnd ʃeɪps]
I can go running.	[aɪ kəŋgəʊ rʌnɪŋ]
They decided to work.	[ðeɪ dəsaɪrəd təwɜ:k]
What's for lunch now?	[wʌts fɔ: lʌntʃ naʊ?
Candy is sweet.	[kændɪ ɪz swi:t]

## Disordered Speech Sentences

Those boats are pretty.	[dəʊz bəʊz a: prɪɪ]
She eats salad.	[ʃi its sælɪd]
String me a bean please.	[gɪŋ i: əɡɪn ɡɪz]
Stop doing it.	[dɒp duɪŋɪt]
Sammy is singing.	[sæmɪ ɪs sɪŋɪŋ]

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## **LINGUISTIC TRADE-OFFS AFTER A SHORT-TERM NARRATIVE INTERVENTION**

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### **ABSTRACT**

Long term gains in syntactic complexity for children with language impairment (LI) occur when syntactic complexity is explicitly targeted in narrative interventions (Petersen, Gillam, Spencer, & Gillam, 2010). Short term gains in language skills not explicitly targeted, such as increased production of syntactic complexity, are rarely reported in the literature (Davies, Shanks, & Davies, 2004; Wolter & Green, 2013). Despite this evidence, Ebbels (2014) suggests that indirect approaches can be effective for teaching syntax. The current study tests Ebbels (2014) assertion by comparing measures of syntactic complexity in the narrative productions of 46 children ( $M$  age = 7 years, 6 months) from culturally and linguistically diverse backgrounds after two intervention sessions that targeted story grammar components, but not syntactic complexity. Fourteen children were identified as LI and 32 children were identified as typically developing (TD). All children exhibited increases from pre-testing to post-testing in the number of grammatical utterances they produced. However, only children with LI demonstrated a linguistic trade off. Their use of complex utterances and morpho-syntactic overgeneralizations both increased. So, the trade-off for improvements in complex syntax is morpho-syntactic accuracy.

**KEY WORDS:** Language Impairment, Intervention, Syntax

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## **INTRODUCTION**

In clinical practice, children's narratives are regularly used to differentiate children with language impairment (LI) from typically developing language (TD) and provide useful, ecologically valid information for children from culturally and linguistically diverse backgrounds (CLD); Botting, 2002; Boudreau, 2008; Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004; Greenhalgh & Strong, 2001; Newman & McGregor, 2006; Norbury & Bishop, 2003; Thomson, 2005). Children with LI demonstrate immediate benefits from narrative intervention for explicitly targeted skills, such as production of story components (e.g., character, initiating event, internal response, action, consequence) (Brown, Garzarek, & Donegan, 2014; Hayward & Schneider, 2000) as well as increased production of complex syntax over time (Petersen et al., 2010). Kramer, Mallet, Schneider, and Hayward (2009) contend that children's increased production of story components may cause them to produce more complex syntax over time. Although studies rarely document changes in syntactic complexity and grammaticality when they are not explicitly targeted in the intervention, children with TD demonstrate gains in nontargeted skills, while children with LI do not (Kramer et al., 2009). In contrast to this evidence, Ebbels (2014) suggests that indirect approaches can be effective for teaching syntax.

To test Ebbels' (2014) assertion, we compared the grammatical changes made by children with LI and those with typical language development (TD) after two sessions of a narrative intervention that did not target syntactic complexity, but instead, targeted the inclusion of story components. To couch this study in the literature, we first discuss differences in syntactic complexity in oral narratives produced by children with LI and children with TD. Then we discuss how each group of children compares on the acquisition of explicit and nonexplicit language targets and how they respond to long-term and short-term language interventions. And finally, we discuss dynamic assessment and why we treated two sessions of the assessment as a short-term intervention.

### **Differences in the Syntactic Production of Children with LI and TD**

In studies that have compared the oral narratives of children with LI and children with TD, children with LI produce shorter stories, use fewer complex sentences, engage in more syntactic errors, and produce shorter utterances than children with TD (Hesketh, 2006; Liles, Duffy, Merritt, & Purcell, 1995; MacLachlan & Chapman, 1988; Newman & McGregor, 2006; Reilly, Losh, Bellugi, & Wulfeck, 2004; Wetherell, Botting & Conti-Ramsden, 2007). For example, when the oral narratives of two groups of 2 ½-year-old children with and without LI were compared, children with LI struggled with the use of past tense verbs and personal pronouns while children without LI did not (Kaderavak & Sulzby, 2000). Even though the children with LI did not use personal pronouns, they still used the character names to maintain reference. Interestingly, another study of 99 TD children and 19 children with LI, found that even at 15 years of age, adolescents with LI still demonstrated more errors of tense agreement and morpheme errors than children with TD (Wetherell et al., 2007).

Overgeneralization is another measure of syntactic production. Overgeneralization requires a "productive application of the morphophonological system", even if the use of a morpheme may in fact be incorrect (Rice, Tomblin, Hoffman, Richman, & Marquis, 2004, p. 830). Children with LI produce fewer overgeneralizations and at a later stage in development than children who are TD. For example, children with LI produce overgeneralizations in an attempt to mark finiteness (e.g., falled for fell) in first through fourth grade, which is later than their peers with TD (Rice et al., 2004). Also, 5- to 6-year-old children with LI have been reported to produce fewer overgeneralizations than age-matched children with TD when using verbs such as sleep and slept (Loeb, Pye, Richardson, & Redmond, 1998). Overgeneralizations with intransitive verbs for children with TD decrease and are minimal by 8 years of age (Brooks, Tomasello, Dodson, & Lewis, 1999). Perhaps use of overgeneralizations changes over time for children with LI, much like it changes for children with TD, but at a different rate. When developing interventions to increase the accuracy and complexity of syntactic productions of children with LI, researchers identify explicit and non-explicit language targets for long-term and short-term interventions, which we discuss next.

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## **Explicit Versus Non-Explicit Language Targets in Long-Term and Short-Term Interventions**

Children with TD and LI demonstrate different patterns of progress on explicit and non-explicit language targets and respond differently to long-term and short-term interventions. Research suggests that eight-year-old children with TD language utilized the adult models provided when telling stories using a picture sequence and single picture narrative elicitation task, while younger children with TD language and children with LI did not use the models provided to them when telling narratives (Ukrainetz & Gillam, 2009). Teaching elaborated language, or the use of more complex syntax, needs to be explicitly addressed during narrative intervention sessions (Ukrainetz & Gillam, 2009). Specifically targeting microstructure in the context of literate narrative intervention can foster complex syntax language development (Petersen et al., 2010).

Children with LI make slow and steady changes during lengthy language interventions with 24, 48, and 96 sessions that directly focus on morpho-syntax (Leonard, Camarata, Pawlowska, Brown, & Camarata, 2008) with some generalization to non-targeted forms (Leonard, Camarata, Pawlowska, Brown, & Camarata, 2006; Leonard, Camarata, Brown, & Camarata, 2004; Tyler, Lewis, Haskill, & Tolbert, 2003). Changes that occur as a result of short-term intervention vary depending on children's language abilities and the type of grammatical structure targeted. For example, third grade children with TD improved on targeted and *non-targeted* components after participating in only two intervention sessions while focusing on just one story grammar element. Conversely, children with possible LI improved on *only* targeted components (Kramer et al., 2009). In contrast to these findings, Ebbels (2014) suggests that short-term indirect language interventions can be effective. Dynamic assessment (DAN), which we discuss next, provides a useful framework to evaluate short-term changes in the syntactic production of children with LI.

## **Dynamic Assessment**

Traditional assessments use static measures and a snapshot of the child's language ability. Dynamic Assessment of Narratives (DAN) differs from the traditional assessment approach because examiners are interested in children's modifiability (Peña, Gillam, Malek, Ruiz-Felter, Resendiz, Fiestas & Sabel, 2006). Modifiability refers to the amount of examiner effort

required when working with children and how responsive the child is to the intervention. DAN has accurately differentiated children with TD and children with LI (Miller, Gillam, & Peña, 2001; Peña et al., 2006). DAN is grounded in Vygotsky's (1978) idea of the Zone of Proximal Development, which describes the distance between the child's lower level of independent functioning and the child's higher level of adult-supported functioning (see Gillam, Peña & Miller, 1999). DAN evaluates the child's changes from pre-test to post-test resulting from participation in Mediated Learning Experience (MLE) sessions (Gillam et al., 1999). Those sessions are scripted and contain the five components of mediated learning: (a) intention to teach, (b) meaning, (c) transcendence, (d) planning, and (e) transfer (Lidz, 1991).

For the intention to teach component, the adult selects a specific goal, explains the goal to the child, and verifies that the child understands the goal. For example, the adult could explain that the child's goal is to identify the characters' names when telling a story. For the meaning component, the adult explains to the child why the goal is important. For example, the adult could explain that the person listening to the story needs to know the names of the characters to understand the story. For the transcendence component, the adult helps the child understand how the goal applies to other aspects of the child's everyday life. For example, the adult could connect storytelling to conversation and ask the child what would happen if the child were trying to have a conversation about two mutual friends with someone and the conversational partner never identified the names of the two friends. For the planning component, the adult helps the child develop a plan for enacting the learning goal. For example, the adult could help the child create a character map to identify who is in the story that the child plans to tell (Gillam et al., 1999). For the transfer component, the adult helps the child develop a plan for applying the goal to other aspects of the child's life (Lidz, 1991). For example, the adult could help the child create the plan of stating the name of each person he or she refers to in a conversation and then observe whether the child enacts the goal during conversation. By progressing through these components, the examiner is able to evaluate small changes the child makes during the MLE sessions and the child's ability to generalize the learning goal (Peña, Resendiz, & Gillam, 2007).

MLE sessions then provide the teach-test learning environment that are a hallmark of intervention.

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Therefore, two MLE sessions are an appropriate context for examining the short-term effects that intervention has on explicit and non-explicit language targets.

## **Summary and Research Questions**

When the oral narratives of children with LI and TD are compared, the narratives of children with LI contain more simple sentences, fewer complex sentences, more syntactic errors, and fewer overgeneralizations than children with TD (Hesketh, 2006; Liles et al., 1995; Loeb et al., 1998; MacLachlan & Chapman, 1988; Newman & McGregor, 2006; Reilly et al., 2004; Wetherell et al., 2007). When exposed to short-term language intervention, children with LI only progress on explicitly taught language targets, while children with TD progress on both explicit and non-explicit targets (Kramer et al., 2009). Despite this evidence, Ebbels (2014) advocates for short-term interventions that indirectly target syntax. To test Ebbels' (2014) assertion, we designed a study to evaluate short-term changes in the context of a DAN narrative task. The explicit language targets were components of story grammar (e.g., character, initiating event, internal response, action, consequence). The non-explicit language targets were the number of dependent clauses in communication units, the number of grammatical utterances, and a change score for the number of overgeneralizations produced between two pre- and post-test sessions. Our specific research questions were:

- Do children with TD and LI make changes in syntax and morpho-syntax from pre-test to post-test after participating in two MLE sessions that focus on teaching story elements?
- Do changes in syntax and morpho-syntax result in improvements for all children or are there trade-offs?
- What aspects of morpho-syntax change from pre-test to post-test for children with LI?

## **METHODS**

### **Participants**

Subjects included 46 first and second grade students from culturally and linguistically diverse backgrounds (European American: 20, Hispanic: 18, African-American: 7, Other: 1). The subjects were enrolled in first and second grade ( $M$  age = 7 years 6 months) from Central Texas and Los Angeles area school districts. Some children (LI = 14; TD = 30) were selected from the

treatment group of a large scale narrative dynamic assessment study (Peña et al., 2006). The remaining children (TD = 2) were recruited specifically for this study.

The 14 children were identified as LI by meeting two of the three following criteria: (1) diagnosis of LI by a certified SLP, (2) parent or teacher concern about language (speech, receptive, expressive), and (3) standardized score at or below  $-1.25$  SD on the Test Of Language Development - Primary 3<sup>rd</sup> Edition (Newcomer & Hammill, 1997) or CASL (Carrow-Woolfolk, 1999). Thirty-two children were identified as TD by meeting three of the four following criteria: (1) no teacher concern about speech, receptive, or expressive language, (2) no parent concern about speech, receptive or expressive language, (3) fewer than 15% semantic, syntactic, and/or pragmatic errors during classroom observation (Patterson & Gillam, 1995), and (4) standardized score within 1 SD on the TOLD:P3 (Newcomer & Hammill, 1997) or CASL (Carrow-Woolfolk, 1999).

### **Procedure**

*Two Friends* (Miller, 1999), a wordless picture book, was used to elicit the pre-test narrative from all of the children (LI and TD). Approximately two weeks later, *Bird and His Ring* (Miller, 1999), another wordless picture book, was used to elicit the post-test narrative. These two books were selected because they are balanced for targeted components (Peña et al., 2006). Two scripted MLE sessions, each lasting approximately 30 minutes occurred between the pre- and post-test. MLE sessions included the five components of mediated learning explained previously (i.e., intention to teach, meaning, transcendence, planning, transfer). Specific feedback was only provided to the children on the story components (e.g., character, initiating event, internal response, action, consequences). Non-targeted areas included productivity and morpho-syntax. The productivity measures were the subordination index and the number of grammatical utterances. The morpho-syntax measure was a change score based on the number of overgeneralizations produced between the two pre- and post-test DAN sessions. Overgeneralizations were considered to occur any time that a child produced a bound morpheme incorrectly. Incorrect bound morpheme productions included overgeneralizing a regular morpheme rule and substituting an incorrect morpheme. By using a morpheme, children were demonstrating that they were

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aware there was a morpheme that should be used, even if the morpheme they used was incorrect. We viewed this as a more productive error than omitting the bound morphemes. For example, if a child said “runned” instead of “ran” that was considered an overgeneralization. Also, if a child said “they walks” instead of “they walked” or “they walk” this was also considered an overgeneralization because the child was attempting to use a bound morpheme, even though the attempt was incorrect.

Use of dialect was taken into consideration for speakers of African American English (AAE). Children who spoke AAE were not penalized for use of AAE dialect. Following the guidelines from Oetting & McDonald (2001), utterances produced by children who used AAE features were not counted as ungrammatical if the constructions followed the rules of AAE. For example, if a child was judged to be a speaker of AAE dialect and used zero regular third person present in the utterance “She talk to the dog,” this construction was not counted as an error. Pre-test and post-test narratives were transcribed and coded using Systematic Analysis of Language Transcripts (SALT) (Miller & Chapman, 2002).

## **RESULTS**

Changes from pre-test to post-test were calculated using a repeated measures ANOVA, with narrative (pre-test and post-test) as the within-subjects factor and group (LI and TD) as the between subjects factors. All children increased the length of their stories as well as the length of their utterances from pre-test to post-test.

To further evaluate the utterances, change in complexity of utterances was calculated using the subordination index (SI). SI was calculated by dividing the number of clauses by the number of utterances in the sample. There was a main effect for time,  $F(1,46)=16.459, p<.001$ . Therefore, both groups increased the complexity of their utterances from pre-test to post-test. Children with LI appeared to benefit from the intervention in the area of sentence complexity (See Figure 1).

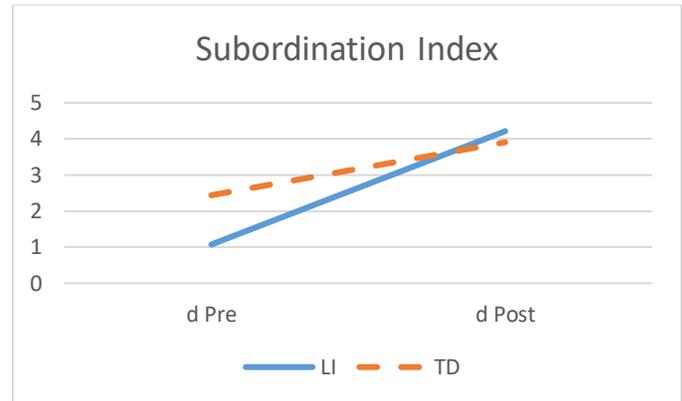


Figure 1. Subordination Index for pre to post changes for children with LI and TD.

Given these results, we speculated that children’s inclusion of dialogue in their narratives might have increased their sentence complexity. For example, the children could have said “The dog said, ‘I found the cat’” instead of “The dog found the cat.” We found no relationship between children’s use of dialogue and sentence complexity.

Grammaticality of utterances was evaluated to examine the quality of children’s utterances. There was a main effect for time,  $F(1,46)=6.873, p=.012$ , but no main effect for group. All groups increased the number of grammatical utterances produced (See Figure 2).

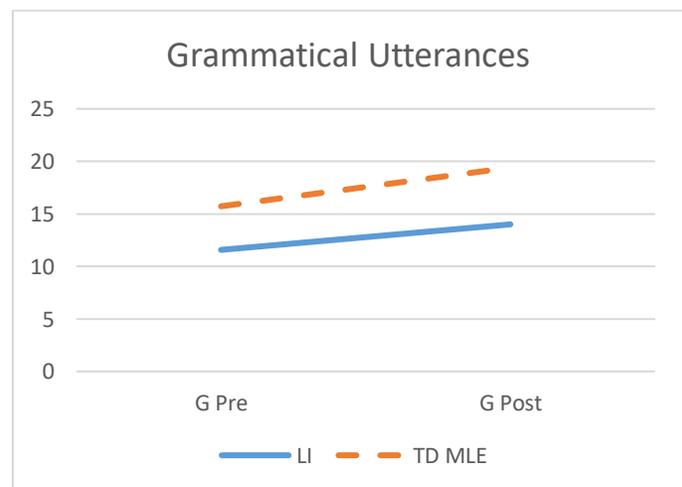


Figure 2. Number of grammatical utterances produced at pre-test and post-test by children with LI and TD.

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Changes in morpho-syntax were evaluated to look at grammaticality in more detail. For the use of overgeneralizations of bound morphemes, we found a main effect for time,  $F(1,46)=4.985$ ,  $p=.031$ , and a trend for group,  $F(1, 46)=3.658$ ,  $p=.06$ . As shown in Figure 3, children with TD produced a minimal number of overgeneralizations while children with LI increased in overgeneralizations from pre- to post-test.

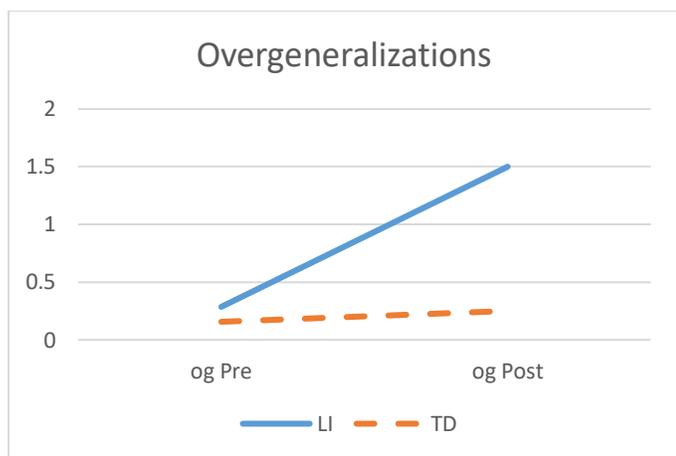


Figure 3. Use of overgeneralizations by children with LI and TD at pre- and post-test.

## **DISCUSSION**

DAN provided an opportunity to evaluate linguistic changes beyond the domains that were targeted in the MLE sessions. From a clinical perspective, this provides information about changes that can be expected during interventions in both targeted and non-targeted areas.

All children exhibited increases from pre-testing to post-testing in the number of complex utterances and the grammaticality of those utterances. Group differences emerged in their production of overgeneralizations. Children with TD demonstrated almost no change from pre- to post-test in their production of overgeneralizations while children with LI produced a similar number of overgeneralizations as children with TD at pre-test but produced many more overgeneralizations than children with TD at post-test.

In contrast with previous studies where children with LI produced fewer complex sentences and more syntactic errors (Hesketh, 2006; Liles et al., 1995; Newman &

McGregor, 2006; MacLachlan & Chapman, 1988; Reilly et al., 2004), children with LI and TD in the current study did not have significant differences in sentence complexity and grammaticality.

Both groups of children produced more grammatical utterances at post-test but the children with TD produced more grammatical utterances than the children with LI. Grammaticality and bound morphemes are an area of difficulty for children with LI at this age. Contrary to previous studies where children with LI omitted bound morphemes (Bellaire, Plante, & Swisher, 1994); children with LI in the current study omitted very few bound morphemes but increased their production of overgeneralizations.

Children with LI demonstrated linguistic trade-offs between syntax and morpho-syntax. As children with LI increased the complexity of their utterances, they also increased the number of errors they made with bound morphemes. This finding supports Ebbels (2014) assertion that short-term indirect approaches can be effective for targeting morpho-syntax indirectly in the context of MLE sessions that directly target story components. Future research is needed to see if these results can be generalized to other language learning tasks across different populations. While trade-offs may occur for children throughout different stages of language learning, the specific trade-offs are likely different for children depending on their language level and age.

## **Clinical Implications**

These results support the importance of continuous assessment of student progress in both targeted and non-targeted areas of language during intervention. The type of errors should also be assessed during intervention, as some errors may be considered more productive than other errors. A specific example that was observed in the current study is the use of overgeneralizations instead of omissions of bound morphemes.

## **REFERENCES**

Bellaire, S., Plante, E., & Swisher, L. (1994). Bound-morpheme skills in the oral language of school-age,

# *Journal of the National Black Association for Speech-Language and Hearing*

- language-impaired children. *Journal of Communication Disorders*, 27, 265-279. doi:10.1016/0021-9924(94)90017-5
- Botting, N. (2002). Narrative as a tool for the assessment of linguistic and pragmatic impairments. *Child Language Teaching and Therapy*, 18, 1-22. doi:10.1191/0265659002ct224oa
- Boudreau, D. (2008). Narrative abilities: Advances in research and implications for clinical practice. *Topics in Language Disorders*, 28, 99-114. doi:10.1097/01.TLD.0000318932.08807.da
- Brooks, P. J., Tomasello, M., Dodson, K., & Lewis, L. B. (1999). Young children's overgeneralizations with fixed transitivity verbs. *Child Development* 70(6), 1325-1337. doi:0009-3920/99/7006-0005
- Brown, J. A., Garzarek, B. A. & Donegan, K. L. (2014). Effects of a narrative intervention on story retelling in at-risk young children. *Topics in Early Childhood Special Education*, 34(3), 154-164. doi:10.1177/0271121414536447
- Carrow-Woolfolk, E. (1999). *Comprehensive assessment of spoken language*. Circle Pines, MN: AGS.
- Davies, P., Shanks, B. & Davies, K. (2004). Improving narrative skills in young children with delayed language development. *Educational Review*, 56(3), 271-286. doi:10.1080/0013191042000201181
- Ebbels, S. (2014). Effectiveness of intervention for grammar in school-aged children with primary language impairments: A review of the evidence. *Child Language Teaching and Therapy*, 30(1), 7-40. doi:10.1177/0265659013512321
- Fey, M. E., Catts, H. W., Proctor-Williams, K., Tomblin, J. B., & Zhang, X. (2004). Oral and written story composition skills of children with language impairment. *Journal of Speech, Language, and Hearing Research*, 47, 1301-1318. doi:10.1044/1092-4388(2004/098)
- Gillam, R. B., Peña, E. D. & Miller, L. (1999). Dynamic assessment of narrative and expository discourse. *Topics in Language Disorders*, 20(1), 33-47. doi:10.1097/00011363-199911000-00005
- Greenhalgh, K. S. & Strong, C. J. (2001). Literate language features in spoken narratives of children with typical language and children with language impairments. *Language, Speech, and Hearing Services in Schools*, 32, 114-125. doi:10.1044/0161-1461(2001/010)
- Hesketh, A. (2006). The use of relative clauses by children with language impairment. *Clinical Linguistics & Phonetics*, 20, 539-546. doi:org/10.1080/02699200500266398
- Hayward, D. & Schneider, P. (2000). Effectiveness of teaching story grammar knowledge to pre-school children with language impairment: An exploratory study. *Child Language Teaching and Therapy*, 16, 255-284. doi:0265-6590(00)CT2060A
- Kaderavek, J. N. & Sulzby, E. (2000). Narrative production by children with and without specific language impairment: Oral narratives and emergent readings. *Journal of Speech, Language, and Hearing Research*, 43, 34-49. doi:10.1044/jslhr.4301.34
- Kramer, K., Mallet, P., Schneider, P. & Hayward, D. (2009). Dynamic assessment of narratives with grade 3 children in a First Nations community. *Canadian Journal of Speech-Language Pathology and Audiology* 33(3), 119-128.
- Leonard, L. B., Camarata, S. M., Pawlowska, M., Brown, B., & Camarata, M. N. (2008). The acquisition of tense and agreement morphemes by children with specific language impairment during intervention: Phase 3. *Journal of Speech, Language, and Hearing Research*, 51, 120-125. doi:10.1044/1092-4388(2008/008)
- Leonard, L. B., Camarata, S. M., Pawloska, M., Brown, B., & Camarata, M. N. (2006). Tense and agreement morphemes in the speech of children with specific language impairment during intervention: Phase 2. *Journal of Speech, Language, and Hearing Research*, 49, 749-770. doi:10.1044/1092-4388(2006/054)
- Leonard, L. B., Camarata, S. M., Brown, B., & Camarata, M. N. (2004). Tense and agreement in the speech of children with specific language impairment: Patterns of generalization through intervention. *Journal of Speech, Language, and Hearing Research*, 47, 1363-1379. doi:10.1044/1092-4388(2004/102)
- Lidz, C. S. (1991). *Practitioner's guide to dynamic assessment*. New York: Guilford Press.

# *Journal of the National Black Association for Speech-Language and Hearing*

- Liles, B. Z., Duffy, R. J., Merritt, D. D., & Purcell, S. L. (1995). Measurement of narrative discourse ability in children with language disorders. *Journal of Speech and Hearing Research, 38*, 415-425. doi:10.1044/jshr.3802.415
- Loeb, D. F., Pye, C., Richardson, L. Z., Redmond, S. (1998). Causative alternations of children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 44*, 1103-1114. doi:10.1044/jslhr.4105.1103
- MacLachlan, B. G. & Chapman, R. S. (1988). Communication breakdowns in normal and language-learning disabled children's conversation and narration. *Journal of Speech and Hearing Disorders, 53*, 2-7. doi:10.1044/jshd.5301.02
- Miller, L. (1999). *Bird and his ring*. Austin, TX: Neon Rose Productions.
- Miller, L. (1999) *Two friends*. Austin, TX. Neon Rose Productions.
- Miller, J. & Chapman, R.S. (2002). *SALT for Windows – Research Version 7.0.*, University of Wisconsin-Madison, Language Analysis Laboratory, Madison, WI: Waisman Center
- Miller, L., Gillam, R. B., Peña, E. D. (2001). *Dynamic assessment and intervention: Improving children's narrative skills*. Austin, TX: Pro-Ed.
- Newcomer, P. & Hammill, D. (1997). *Test of Language Development – Primary, Third Edition*. Austin, TX: Pro-Ed.
- Newman, R. M. & McGregor, K. K. (2006). Teachers and laypersons discern quality differences between narratives produced by children with or without SLI. *Journal of Speech, Language, and Hearing Research, 49*, 1022-1036. doi:10.1044/1092-4388(2006/073)
- Norbury, C. F. & Bishop, D. V. M. (2003). Narratives skills of children with communication impairments. *International Journal of Language & Communication Disorders, 38*, 287-313. doi:10.1080/136820310000108133
- Oetting, J. B. & McDonald, J. L. (2001). Nonmainstream dialect use and specific language impairment. *Journal of Speech, Language, and Hearing Research, 44*, 207-223. Doi:10.1044/1092-4388(2001/018)
- Patterson, S. & Gillam, R. B. (1995). Team collaboration in the evaluation of language in students above the primary grades. In D. Tibbits (Ed.), *Language intervention: beyond the primary grades*. Austin, TX: Pro-Ed.
- Peña, E. D., Gillam, R. B., Malek, M., Ruiz-Felter, R., Resendiz, M., Fiestas, C., & Sabel, T. (2006). Dynamic assessment of school-age children's narrative ability: An experimental investigation of classification accuracy. *Journal of Speech, Language, and Hearing Research, 49*, 1037-1057. doi:10.1044/1092-4388(2006/074)
- Peña, E. D., Resendiz, M. & Gillam, R. B. (2007). The role of clinical judgements of modifiability in the diagnosis of language impairment. *Advances in Speech Language Pathology, 9*(4), 332-345. doi:org/10.1080/14417040701413738
- Petersen, D. B., Gillam, S. L., Spencer, T. & Gillam, R. B. (2010). The effects of literate narrative intervention on children with neurologically based language impairment: An early stage study. *Journal of Speech, Language, and Hearing Research, 53*, 961-981. doi:10.1044/1092-4388(2009/09-0001)
- Reilly, J., Losh, M., Bellugi, U., & Wulfeck, B. (2004). "Frog, where are you?" narratives in children with specific language impairment, early focal brain injury, and Williams syndrome. *Brain and Language, 88*, 229-247. doi:10.1016/S0093-934X(03)00101-9
- Rice, M. L., Tomblin, J. B., Hoffman, L., Richman, W. A., Marquis, J. (2004). Grammatical tense deficits in children with SLI and nonspecific language impairment: Relationships with nonverbal IQ over time. *Journal of Speech, Language, and Hearing Research, 47*, 816-834. doi:10.1044/1092-4388(2004/061)
- Thomson, J. (2005). Theme analysis of narratives produced by children with and without specific language impairment. *Clinical Linguistics & Phonetics, 19*, 175-190. doi:org/10.1080/02699200410001698616
- Tyler, A. A., Lewis, K. E., Haskill, A., & Tolbert, L. C. (2003). Outcomes of different speech and language goal attack strategies. *Journal of Speech, Language,*

# *Journal of the National Black Association for Speech-Language and Hearing*

*and Hearing Research*, 46, 1077-1094.  
doi:10.1044/1092-4388(2003/085)

Ukrainetz, T & Gillam, R. B. (2009). The expressive elaboration of imaginative narratives by children with specific language impairment. *Journal of Speech, Language, and Hearing*, 52, 883-898. doi:1092-4388/09/5204-0883

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wetherell, D., Botting, N., & Conti-Ramsden, G. (2007). Narrative in adolescent specific language impairment (SLI): A comparison with peers across two different narrative genres. *International Journal of Language & Communication Disorders*, 42(5), 583-605. doi:10.1080/13682820601056228

Wolter, J. A. & Green, L. (2013). Morphological awareness intervention in school-age children with language and literacy deficits, *Topics in Language Disorders*, 33(1), 27-41. doi:10.1097/TLD.0b013e318280/5aa

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## **REPORTED BOOK-SHARING PRACTICES OF SPANISH-ENGLISH SPEECH-LANGUAGE PATHOLOGISTS WHO TARGET ACADEMIC LANGUAGE IN PRESCHOOLERS**

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### **ABSTRACT**

When an adult and a child read a book together, they interact with the book. To promote academic language use, parents and educators are encouraged to direct 60% of their talk during book-sharing sessions to the cognitive and linguistic content that preschoolers have already mastered and to direct 40% to the cognitive and linguistic content that is relatively abstract (e.g., higher level vocabulary, predictions, inferences). Past research has viewed book sharing largely through a monolingual lens. When another language is added to book sharing, the relationships among the book, the adult, and the child become more complex. To capture this complexity, we surveyed 90 Spanish-English bilingual speech language pathologists (SLPs) who treat Spanish-English preschoolers for academic language to analyze the complex relationships among the book, the adult, and the child. Our online survey was designed to evaluate the multivariate effects of a book factor (i.e., language version of books), adult factors (e.g., experience, reading behavior), and child factors (i.e., language input, existence of home reading routine). Two patterns in the data explained 90.69% of the total variance of the responses. For preschoolers receiving Spanish input, SLPs who used books written in Spanish tended to read every word of the text whereas SLPs who translated English books into Spanish tended to read only some text. For preschoolers receiving equal amounts of Spanish and English input, SLPs used dual language books or two books in each language. Only the SLPs who used translated books knew whether an adult read at home to the preschoolers. SLPs must know whether bilingual preschoolers are read to at home because preschoolers unfamiliar with book sharing discourse routines may not know how to respond. SLPs should not translate English books into Spanish because the academic language targets will likely be compromised. Alternative clinical activities are presented.

**KEY WORDS:** Book sharing; read aloud; speech-language pathology; preschool; bilingual; academic language

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## INTRODUCTION

A book, an adult, and a child are three components that interact when an adult reads aloud to a child (Martinez & Roser, 1985; Sulzby & Teale, 1987; van Kleeck, 2003). Much has been written about how these components influence the types of extra-textual talk that accompany a read aloud (e.g., Dickinson & Smith, 1994a; Pellegrini, Brody, & Sigen, 1985). To promote the oral language skills necessary for later text comprehension and school success, parents and educators are told to direct 60% of their extra-textual talk to the cognitive and linguistic content that the child has already mastered and to direct the remaining 40% of their talk to the cognitive and linguistic content that is relatively abstract (van Kleeck, 2006b, 2014; van Kleeck, Stahl, & Bauer, 2003), such as higher level vocabulary (e.g., Beck, McKeown, & Kucan, 2013; McGee & Schickedanz, 2007; Whitehurst, Crone, Zevenbergen, Schultz, & Velting, 1999) as well as predictions and inferences about story events and character motivations (e.g., Dickinson & Smith, 1994a; van Kleeck, 2006b, 2014; Van Kleeck, Gillam, Hamilton, & McGrath, 1997). The use of these higher level cognitive and oral language skills—recently referred to as an “academic talk register”—is seen as critical to later text comprehension and school success (van Kleeck, 2014). Children’s books have proven to be a strong medium for helping preschoolers learn high level language structures and so speech language pathologists (SLPs) are encouraged to use books in therapy (e.g., American Speech-Language-Hearing Association, 2008; Justice & Kaderavek, 2004; van Kleeck, 2006b; van Kleeck et al., 2003).

The aforementioned research typically views book sharing largely through a monolingual lens. When another language is added to the book sharing process, the relationships among the book, the adult, and the child become more complex than when only one language is involved (Barrera & Bauer, 2003). Take, for example, a Spanish-English bilingual SLP who reads Eric Carle’s (1987) *Very Hungry Caterpillar* with a Spanish-English bilingual preschooler for the purpose of increasing the child’s academic language. What language version of the book (book factor) should the SLP use (e.g., Spanish

version, English version, dual language version that includes both languages on each page of the book)? Does the SLP’s language dominance and cultural affiliation influence his or her choices? Also, should the SLP read every word in the book during the read aloud or just some of the words and focus mainly on the illustrations (SLP factors)? What is the relationship of these book and SLP factors to the language input the child receives at home and school and the literacy practices in the child’s home (child factors)?

Existing bilingual research does not adequately address the complex linguistic and socio-cultural factors influencing book sharing practices (Barrera & Bauer, 2003). With scholars encouraging SLPs to use book sharing as one way of promoting the academic talk register (e.g., American Speech-Language-Hearing Association, 2008; Justice & Kaderavek, 2004; van Kleeck, 2006a, 2014; van Kleeck et al., 2003), we need to understand how bilingual SLPs actually share books with bilingual preschoolers.

In this article, we present the results of a survey—that we conducted with practicing Spanish-English bilingual SLPs—to analyze the complex relationship of the three components of a read-aloud: the story, the SLP, and the child. To couch our study in existing research, we describe the academic talk register in mainstream American culture and the role book sharing has in promoting it. We then compare aspects of the academic talk register to the social interaction patterns of Spanish-dominant caregivers and their preschoolers when sharing books. Given the influence of home literacy practices on preschoolers (e.g., Ezell, Gonzales, & Randolph, 2000; Gadsen, 2004; Sulzby & Teale, 1987) and the fact that SLPs treat across settings (e.g., private practice, universities, American Speech-Language-Hearing Association, 2016), we then identify the linguistic and sociocultural trends related to book, adult, and child factors in two bodies of research: (a) school-based literacy interventions and (b) home-based literacy programs.

### **The Academic Talk and Casual Talk Registers**

As a new way for SLPs to consider oral proficiency, van Kleeck (2014) deconstructs oral language into two registers, casual talk and academic talk—a

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conceptualization somewhat reminiscent of Bernstein's (1964) distinction between restricted and elaborated linguistic codes. van Kleeck (2014) conceptualizes these two registers as points on a continuum that middle class Anglo European American preschoolers spontaneously learn to identify. For her, these two registers differ mainly by their degrees of formality, with casual talk being mostly informal and academic talk being mostly formal. The casual talk register is used to accomplish activities in the immediate context and to maintain relationships, a usage that lends itself to shared control of the topic (van Kleeck, 2014). The vocabulary used in casual talk typically includes high frequency and familiar words that are morphologically simple (Beck et al., 2013; van Kleeck, 2014)—words that typically developing children acquire spontaneously. The sentences produced in casual talk tend to be in the active voice, short in length and with few prepositional phrases or expanded noun phrases. Casual talk sentences often include contractions and pronouns that refer to the physical context (van Kleeck, 2014).

Conversely, the academic talk register—which is the register prevalent in school instruction—is used by adults to transmit knowledge and by children to construct and demonstrate knowledge (van Kleeck, 2014). This register is spontaneously used in the discourse patterns of middle class Americans (called in this article “mainstream culture”). In the academic talk register, the adult leads the topic and encourages the child to participate (van Kleeck, 2014; van Kleeck & Schwarz, 2011). The vocabulary is closer to written text than to oral conversation (Beck et al., 2013) and includes relatively long and morphologically complex words (van Kleeck, 2014). The sentences produced are relatively long, sometimes in the passive voice, rarely include contractions, and tend to include pronouns that refer to an earlier linguistic context rather than the immediate physical context (van Kleeck, 2014). With later reading achievement and overall school success having a strong relationship with children's ability to use academic talk in school (Scheele, Leseman, Mayo, & Elbers, 2012), van Kleeck (2014) urges SLPs to assess preschoolers for command of the academic talk register and to provide language therapy for those who do not have it.

## **Book Sharing and Academic Talk**

Sharing books with preschoolers can be an excellent tool for teaching the academic talk register because adults can

provide the cognitive and linguistic scaffolding preschoolers need within a socially engaging activity (van Kleeck, 2006b, 2014; van Kleeck & Schwarz, 2011; van Kleeck et al., 2003). The cognitive and linguistic scaffolding that adults provide when sharing books can be classified as either eliciting a low or a high cognitive demand (Dickinson & Smith, 1994b). Examples of low cognitively demanding talk in book sharing includes labeling of objects and actions as well as direct recall of information in the book. A high cognitively demanding talk in book sharing includes analyzing characters and events, linking the text with the children's life experiences, making predictions and inferences, defining vocabulary, expanding and clarifying children's utterances, and evaluating information in the text (Dickinson & Smith, 1994b). Based on discourse patterns of mainstream American caregivers, the academic talk register for preschoolers should include approximately 60% of low cognitively demanding talk so preschoolers can be successful and approximately 40% of high cognitively demanding talk so they can be sufficiently challenged (van Kleeck, 2006b, 2014).

Because the academic talk register used in school instruction is grounded in the discourse patterns of mainstream American families who regularly read books to their children, preschoolers from culturally and linguistically diverse (CLD) backgrounds—such as Spanish-English dual language learners (DLL) from low socioeconomic status (SES) families—often are exposed to less cognitively demanding extra-textual talk than their mainstream American peers, a problem that we discuss next.

The overall experience and quality of the extra-textual talk during book sharing depends upon whether the low SES Spanish-English caregivers have an established reading routine with their children. For caregivers who have an established reading routine, book sharing does not serve an academic function in these families, but instead serves a social and affective function—a time for caregivers to engage their children (Hammer, Nimmo, Cohen, Draheim, & Johnson, 2005). These caregivers tend to demonstrate one of two reading styles: They either encouraged their children to act as the main storyteller, providing support where needed, or they led the activity by reading most of the text, asking questions, labeling vocabulary, and commenting on the story. They were also highly responsive to their preschoolers' contributions. This latter style is similar to the book sharing style of

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mainstream American caregivers (Hammer et al., 2005). However, there are important differences in the cognitive demand of the extra-textual talk between mainstream American and low SES Puerto Rican caregivers (Hammer et al., 2005). Mainstream American caregivers included approximately 60% of low cognitively demanding and 40% of high cognitively demanding extra-textual talk (van Kleeck, 2006b, 2014). Conversely, the low SES Puerto Rican caregivers included almost 100% of lower cognitively demanding talk. In other words, the extra-textual talk aligned more closely with the casual talk register than with the academic talk register. For example, Puerto Rican caregivers did not ask their children to make predictions or inferences about the text and did not link the text to their children's life experience (Hammer et al., 2005), all of which would have elicited from the children the high cognitive demand found in the academic talk register (Dickinson & Smith, 1994b; van Kleeck, 2014).

For caregivers who do not have an established reading routine with their children, book sharing can be a foreign experience (Anderson, Anderson, Lynch, & Shapiro, 2003; Kermani & Janes, 1997). Unfortunately, many of these caregivers equate book sharing with a form of punishment (Janes & Kermani, 2001), and so rarely praise their children or show positive affect during the interaction (Kermani & Janes, 1997). These caregivers also have difficulty identifying with the characters and stories in commercially available books (Kermani & Janes, 1997) because the books are not grounded in the storytelling traditions of these families (Boyce, Innocenti, Roggman, Jump Norman, & Ortiz, 2010).

Therefore, when they enter school, DLL preschoolers from homes that include book sharing as a regular practice have a different set of associations than DLL preschoolers from homes that do not. For the most vulnerable DLL population—preschoolers from migrant families—the home literacy environment has the greatest impact on children's preliteracy skills compared to the school environment (Ezell et al., 2000). For this reason, we consider whether DLL preschoolers are read to at home as an important child factor. Given the importance of the home environment on book sharing interactions (e.g., Ezell et al., 2000; Gadsen, 2004; Sulzby & Teale, 1987), we examine below both school-based and home-based literacy interventions that included book sharing and Spanish-English DLL preschoolers to identify adult factors, book factors, and additional child factors that interact during book sharing interventions.

## **Intervention Studies**

All of the interventions including book sharing targeted extra-textual talk techniques that lent themselves to classification using Dickinson and Smith's (1994b) definitions of low and high cognitive demands. The majority of school-based interventions included all of the low and high cognitively demanding extra-textual talk categories listed above. Conversely, the majority of home-based interventions included only labeling of objects and actions (a low cognitively demanding type of talk), linking the text to the children's life experience, and expanding, recasting, and clarifying the children's utterances (both high cognitively demanding types of talk), and the broad category of asking open-ended questions, the latter of which does not fit neatly within Dickinson and Smith's (1994b) classification system. The majority of home-based book sharing interventions also included another type of extra-textual talk, managing the interaction, an activity described by Dickinson and Smith (1994b) as maintaining the children's attention and providing a positive emotional experience.

These school-based and home-based book sharing studies included Spanish-dominant or Spanish-English bilingual preschoolers who were either receiving or expected to receive the majority of their education in English. We organized these studies by the type of input children received during the book sharing interventions to highlight how adult-child interaction patterns, home literacy practices, and the type of book used mediate the success of these interventions. The four types of input children received, which we discuss next, are: (a) English only, (b) English with Spanish definitions of key vocabulary, (c) equal amounts of both Spanish and English input, and (d) predominantly Spanish input.

**Children receive only English input.** In the four studies in which children received only English input during the book-sharing interventions, the researchers were only concerned with pre-literacy development in English (L2) and used commercially available books written in English (O'Brien et al., 2014; Pollard-Durodola et al., 2016; Roberts & Neal, 2004; Silverman, Crandell, & Carlis, 2013). Only one study (Pollard-Durodola et al., 2016) reported on whether the children were read to at home. These studies included three school-based interventions (Pollard-Durodola et al., 2016; Roberts & Neal, 2004; Silverman et al., 2013) and one home-based intervention

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(O'Brien et al., 2014) that lasted between 12 and 18 weeks.

The school-based studies all included researcher-created English receptive vocabulary measures that were similarly constructed (Pollard-Durodola et al., 2016; Roberts & Neal, 2004; Silverman et al., 2013) while one study included a researcher-created English expressive vocabulary measure (Pollard-Durodola et al., 2016). These studies compared read-alouds with extension activities focused on vocabulary comprehension compared to read-alouds only (Silverman et al., 2013), read-alouds “as usual” (Pollard-Durodola et al., 2016), letter/rhyme instruction without books, and no read-alouds (Roberts & Neal, 2004). Across studies, children in the read-aloud with extension activities focusing on vocabulary comprehension achieved significantly higher English receptive vocabulary scores (Pollard-Durodola et al., 2016; Roberts & Neal, 2004; Silverman et al., 2013) and English expressive vocabulary scores (Pollard-Durodola et al., 2016) than children in the control conditions. The size of the effects distinguishes the type of extension activities. Introducing key vocabulary concepts using a video before conducting the read-alouds and reviewing key vocabulary before, during, and after re-readings with real objects produced a large effect (Roberts & Neal, 2004) but just re-reading the books and reviewing key vocabulary throughout the day, produced small to medium effects (Pollard-Durodola et al., 2016; Silverman et al., 2013).

The one home-based intervention study measured English receptive vocabulary using a standardized norm-referenced test when comparing a read-aloud treatment group to a no treatment group (O'Brien et al., 2014). Caregivers had limited oral English proficiency and were receiving literacy instruction as part of the intervention. The caregivers' reading levels in English or Spanish were not reported. Given that part of the caregiver training consisted of having the caregivers practice reading the books in English, it is unclear how fluent they were and whether they read every word of the text or just some of the words and focused mainly on the illustrations. O'Brien et al (2014) found a significant but small effect and only for the preschoolers who had low English receptive vocabulary prior to intervention.

Therefore, read-aloud interventions that include only English input significantly improve Spanish-English bilingual preschoolers' receptive vocabulary. The

differences in the magnitude of effect were attributed to the type of extension activities and either the receptive measure used or the intervention agent (educator vs caregiver). The differences in effect sizes between the school-based and home-based interventions are likely due to differences between the trained research staff and caregivers who administered the interventions.

**Children receive English input with Spanish definitions of key vocabulary.** In the two studies that had adults provide children with English input as well as Spanish definitions of key vocabulary during the book-sharing interventions, the researchers were concerned with creating conceptual understandings of L2 (English) key vocabulary through L1 (Spanish) support (Leacox & Jackson, 2014; Lugo-Neris, Jackson, & Goldstein, 2010). These school-based interventions lasted only 2 to 4 weeks and used commercially available books written in English. Only one study reported that very few children were read to at home (Lugo-Neris et al., 2010) while the other did not report on home book-sharing practices. The three researcher-created vocabulary measures were: (a) English receptive vocabulary, (b) English expressive vocabulary, and (c) bilingual expressive definitions. These studies compared the conditions of read-alouds in English with embedded Spanish definitions of key vocabulary to either read-alouds in English only (Leacox & Jackson, 2014) or read-alouds in English with English definitions (Lugo-Neris et al., 2010). The only significant result occurred for bilingual expressive definitions when read-alouds with embedded Spanish definitions of key vocabulary were compared to read-alouds in English (Leacox & Jackson, 2014). So, preschoolers could define the new vocabulary in Spanish but could not identify or name the words in English, which was the point of the intervention. It is unclear whether the non-significant results for the English outcomes were due to (a) the type of input the children received, (b) the relatively short duration of the interventions, and/or (c) the small number of participants, which was 24 preschoolers in each study.

**Children receive equal amounts of English and Spanish input.** In the two studies in which children received equal amounts of English and Spanish input during the book sharing interventions, the researchers were concerned with supporting the development of both languages through book sharing (Roberts, 2008; Tsybina & Eriks-Brophy, 2010). Both of these studies were home-based literacy interventions that recruited different populations and had different purposes. Roberts (2008)

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included two cohorts of families that were Spanish-dominant (32%) and Hmong-dominant (68%) and tested whether having parents share books in L1 (Spanish and Hmong) for six weeks or books in L2 (English) for six weeks increased English receptive vocabulary. Roberts used commercially available books in English, in Spanish, and books translated from English into Spanish and Hmong because not enough books were available in the families' L1. These translated books were "not necessarily aligned with the cultural backgrounds" of the families. (Roberts, 2008, p. 109). Roberts did not report the caregivers' reading ability in L1 or English but did indicate that many caregivers had low English proficiency. Caregivers who could not read were encouraged to "engage in storybook reading by talking about the pictures and telling a story" (Roberts, 2008, p. 110). Roberts reported that only the first cohort of children demonstrated significantly higher English receptive vocabulary with a medium effect compared to when caregivers read books in L1. Unfortunately, Roberts (2008) did not test the effect of the intervention on the children's L1 receptive vocabulary; so we do not know whether the intervention impacted L1 vocabulary development.

Tsybina and Eriks-Brophy (2010) measured change in their intervention in both English and Spanish. They tested the effect of equal input during a book-sharing intervention on preschoolers who were all Spanish-English bilingual with significant expressive language delay (e.g., 5th percentile to 35th percentile). The education attainment of caregivers ranged from high school diplomas to post-secondary education. Tsybina and Eriks-Brophy used commercially available English books and Spanish books and designed their study with a treatment group and a no treatment group. The treatment group received 60 book sharing sessions with half conducted by the caregivers in Spanish using commercially available books written in Spanish and half conducted by the researcher in English using commercially available books in English. Preschoolers in the treatment group demonstrated significant increases with large effects for both English and Spanish receptive vocabulary compared to preschoolers in the no treatment group.

The results, therefore, for using equal amounts of English and Spanish during book sharing interventions collectively indicate positive results for vocabulary development. These two studies also introduce two

additional factors related to the books used in book sharing interventions: (a) the language version of the book and (b) how much of the text in the storybooks is read aloud. Both studies included English books and Spanish books, while only Roberts (2008) included English books translated into Spanish. Also, an unknown number of caregivers in Roberts used only the illustrations to tell the stories of the books. Note that Sulzby and Teale (1987) found notable differences in how preschoolers retold stories based on whether the stories were read or translated. Because of the different measures used, these studies cannot explain how differences in the amount of text read impacts acquisition of vocabulary and other higher level structures (e.g., syntax, inferencing). Given Sulzby and Teale's (1987) findings, two important questions arise from these studies: a) Is it common practice among bilingual language interventionists to translate storybooks in therapy and this practice, in turn, raises the question b) how does translating storybooks alter the input the child receives compared to reading most or all of the text?

**Children receive mostly or only Spanish input.** In the ten studies that had adults provide children with mostly or only Spanish, there were three separate goals: (a) prevent Spanish language loss for children educated in English only preschool programs; (b) change the discourse patterns caregivers use when sharing books with children so that the caregivers' discourse patterns are more similar to the discourse patterns used in the U.S. public schools; and (c) simply ground shared reading practices within the storytelling and literacy practices already established in families that do not have a regular book sharing routine.

The one school-based intervention study we found attempted to prevent Spanish language loss. It tested whether a relatively short and intense treatment (i.e., 5 days a week for 15 to 30 minutes a day for 16 weeks) could prevent language loss of Spanish in bilingual DLL preschoolers who attended English-only preschool programs (Restrepo et al., 2010). The study included three outcomes measured in Spanish only: (a) sentence length measured in mean length of T-unit (number of main clauses and subordinate clauses), (b) sentence complexity using a subordination index, and (c) grammaticality using the number of grammatical errors per T-unit. These outcomes were measured at baseline, immediately after, and four months after the intervention. Very few of the preschoolers were read to at home. All of the books used in the supplemental Spanish intervention were

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commercially available and written in Spanish. The study compared: (a) preschoolers who received the English only instruction supplemented by the Spanish intervention to (b) preschoolers who received just the English-only instruction in the classroom. Although the children showed no significant difference between experimental conditions immediately after intervention, children who received the supplemental read-aloud instruction in Spanish achieved significantly higher scores on sentence length and complexity, with large and medium effects respectively four months after the intervention.

We found five studies that attempted to change the caregivers' discourse patterns. The success of these studies depended upon whether the family already included book sharing as a cultural practice (Wasik, Dobbins, & Hermann, 2001). When the caregivers already had an established book sharing routine prior to the intervention, both the caregivers and the children made progress adapting their discourse patterns when using commercially available Spanish books (Brannon & Dauksas, 2014; Rodriguez-Brown & Mulhern, 1993) and books made by the researcher based on common family routines (Ijalba, 2015). For example, compared to caregivers who did not receive training, caregivers who received training significantly and largely increased the frequency with which they posed questions during book reading (Brannon & Dauksas, 2014). Also, caregivers modeled reading and writing more often, engaged in literacy activities more often and visited the library more often at the end of the intervention (Rodriguez-Brown & Mulhern, 1993) than they had done prior to intervention. As a result, preschoolers showed large and significant increases in expressive and receptive vocabulary in both Spanish and English (Ijalba, 2015).

In studies with caregivers who did not engage in book sharing prior to the intervention (Eldridge-Hunter, 1992; Kermani & Janes, 1997) or studies that did not report home book-sharing practices (Baker, Piotrkowski, & Brooks-Gunn, 1998), attrition rates ranged from 33% to 50%, a large proportion that suggests caregiver dissatisfaction. The majority of caregivers in these studies had weak Spanish language skills (Boyce et al., 2010) and had none to limited education in Spanish (Kermani & Janes, 1997). So caregivers were likely not reading the books to the children but rather telling them the story using the illustrations. For year one of their study, Kermani and Janes (1997) cited two reasons for their high attrition rate (> 40%). First, although they included

Spanish-speaking trainers, few were native speakers and few understood and/or valued the cultural practices of the families. The lack of native Spanish-speaking trainers in year one resulted in miscommunications between the trainers and caregivers. Second, many caregivers had difficulty identifying with the commercially available Spanish storybooks used in the intervention because the stories and characters in the books were dissimilar from their own experience. For the caregivers who remained in these high attrition studies, researchers found the caregivers were successful at highlighting vocabulary when sharing books but were unsuccessful at modeling targeted scaffolding techniques. Specifically, they did not connect the story to their children's lives (Eldridge-Hunter, 1992), make predictions about the story (Eldridge-Hunter, 1992; Kermani & Janes, 1997), or reason about the text (Kermani & Janes, 1997), all of which elicit the higher cognitively demanding talk prevalent in the academic talk register.

Studies that attempted to ground book sharing in established family storytelling practices, instead of increasing levels of academic talk during book sharing, included Spanish-dominant caregivers who did not read books to their children (Kermani & Janes, 1997) and Spanish-dominant caregivers who "had low levels of education and weak language skills in their first language according to the Woodcock-Muñoz Language Survey" (Boyce et al., 2010, p. 349). Two studies used homemade storybooks that chronicled family stories (Boyce et al., 2010; Kermani & Janes, 1997) while one study used commercially available books written in Spanish (Wessels, 2014). When compared to caregivers who did not receive training, caregivers receiving training that used homemade storybooks significantly increased the frequency of eliciting responses from their children with a moderate magnitude of change (Boyce et al., 2010). Importantly, when Kermani and Janes (1997) changed from using commercially available (Year 1) books to homemade storybooks (Years 2 and 3) and also increased the number of native Spanish speaking tutors, their attrition rate dropped from more than 40% in Year 1 to 10% in Years 2 and 3. Although their intervention no longer focused on changing the discourse patterns of the caregivers to match the mainstream American discourse patterns as it had in Year 1, Kermani and Janes were successful at getting families to link book sharing with the cultural practice of storytelling in Years 2 and 3. After participating in a similar book-sharing study, caregivers

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reported that they had established a 4 to 5 day a week book sharing routine with their preschoolers and had learned that sharing books provides opportunities for conversation and fun (Wessels, 2014).

**Summary.** Our review of the school-based and home-based book sharing interventions that included Spanish-English DLL preschoolers identifies complex relationships among the three components of read-alouds—the book, the adult, and the child (Martinez & Roser, 1985; Sulzby & Teale, 1987; van Kleeck, 2003). The adult factors are: (a) whether the adult is fluent in Spanish, including whether the adult understands and values the family and child’s culture, and (b) how much of the text the adult actually reads during book sharing. The child factors are (a) the type of language input the child is given and/or requires and (b) whether the child is read to at home. The book factors are: (a) the language version of the books and (b) whether the books are commercially produced or homemade.

When preschoolers received (a) English input with English books, (b) equal amounts of English and Spanish input with books in both languages, and (c) Spanish input from a native Spanish speaking SLP, DLL preschoolers showed significant gains in English vocabulary (O’Brien et al., 2014; Pollard-Durodola et al., 2016; Roberts, 2008; Roberts & Neal, 2004; Silverman et al., 2013), in Spanish vocabulary (Tsybina & Eriks-Brophy, 2010) and in Spanish sentence complexity (Restrepo et al., 2010). However, when preschoolers received English input with English books and key vocabulary were defined in Spanish, they did not show significant increases in English vocabulary (Leacox & Jackson, 2014; Lugo-Neris et al., 2010).

In the reviewed studies, the success of book sharing interventions with only Spanish input depended upon whether book sharing was an established family practice and whether commercially available or homemade books were used. When the family culture included book sharing as a regular practice, caregivers successfully adapted their discourse patterns to those modeled in interventions that used commercially available books (Brannon & Dauksas, 2014; Rodriguez-Brown & Mulhern, 1993). When the family culture did not include book sharing, researchers abandoned efforts to change caregivers’ discourse patterns and, instead, focused on helping caregivers associated book sharing with established family storytelling practices (Boyce et al.,

2010; Eldridge-Hunter, 1992; Kermani & Janes, 1997). In this situation, it is critical for the interventionist to identify with and value the cultural practices of the family, a behavior which is most easily accomplished by native Spanish-speaking interventionists (Kermani & Janes, 1997). Two important unanswered questions raised by this research concern how much of the storybook text adults read during book sharing and whether translating English books into Spanish for intervention is a widespread practice. At this time, the answers to these questions are not known. If, however, interventionists read less than the full text and if translating English books is a widespread practice, it will be important to understand how both of these practices affect the quantity, quality, and type (i.e., low or high cognitive demand) of extra-textual talk DLL preschoolers receive during book sharing interventions. In other words, are preschoolers consistently being exposed to the academic talk register or do these practices cause the SLP to fall unintentionally into the casual talk register?

The school-based and home-based literacy interventions all describe decisions made by researchers, so do not necessarily reflect the practices of experienced bilingual SLPs. Our purpose is to elucidate how these adult factors, child factors, and book factors interact in the practice of experienced Spanish-English bilingual SLPs when they use storybooks to treat Spanish-English bilingual preschoolers to improve their academic talk register. Because published studies used homemade books to link book sharing with family storytelling practices—and not to promote the academic talk register—we excluded homemade books as a book factor in our survey. We also added a setting variable as an adult factor because we thought that the setting in which the SLP works might affect which books are used in book-sharing interventions.

## **Research Questions**

Our research questions were:

- (1) What patterns do SLPs report concerning their experience, reading behavior during read-alouds, language dominance, cultural affiliation, and work setting (SLP factors)?
- (2) What patterns do SLPs report concerning the type(s) of language input they provide children and whether they know if the children are read to at home (child factors)?

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- (3) What patterns do SLPs report concerning the language version of the books they select when treating academic language in children (book factors)?

## **METHODS**

### **Ethics Statement**

All experimental procedures and forms were approved by the Texas State University Institutional Review Board.

### **Survey Instrument**

A web-based survey was developed to reveal the preliteracy practices of experienced bilingual SLPs who treat preschoolers for the academic talk register. We field tested the survey with Communication Disorders faculty and attendees of the 2016 Texas Speech and Hearing Association convention. From our preliminary evaluation of these results along with both face-to-face and electronic discussions with many of the participants, we further refined the survey. In this article, we only discuss the results from the portion of the survey that concerned the bilingual SLPs use of storybooks to treat the academic talk register. This portion of the survey included 14 items with yes-no, multiple choice, and Likert-type questions.

Surveys were administered through SNAP, a web-based survey program that incorporates the security, access, and permissions required by Institutional Review Board (IRB) guidelines. This project was exempt from full board review. The survey took approximately 15 minutes to complete and all responses were anonymous. The first screen of the survey was a consent form. Participants indicated consent by clicking a button on the survey. No personal or identifying information was collected from the participants and they were allowed to skip questions. Only completed surveys were saved on the secure server for analysis.

### **Participants**

Our target populations for the survey were Spanish-English bilingual SLPs who had treated Spanish-English bilingual preschoolers within the last three years for the oral language skills necessary for later text comprehension (i.e., the academic talk register). Our inclusion criteria excluded researchers and supervisors who did not actually treat preschoolers because we wanted to know what practitioners actually do rather than what they were instructed to do. We reached out to potential respondents four ways. First, we conducted an

advanced search in the ASHA membership directory for members who indicated expertise in bilingualism and early intervention (speech, not audiology). This advanced search identified 2,024 members who had made their contact information available. Note that the directory does not indicate which members are Spanish-English bilingual nor those who serve preschoolers. We personally emailed each of these members one time inviting them to participate in the survey. Second, we posted an invitation to participate on the listserv for the Cultural and Linguistic Diversity ASHA special interest group 14. Third, we asked contracting firms specializing in hiring bilingual SLPs to send an electronic invitation to their work force. Fourth, we posted invitations to participate on university and personal Facebook pages.

To estimate our return rate, we used demographic data for ASHA members who provide bilingual services (American Speech-Language-Hearing Association, 2016) and the ASHA Schools Survey (American Speech-Language-Hearing Association, 2014). As of March 2016, 6,594 ASHA members were Spanish-English bilingual SLPs and 7.40% of all bilingual SLPs (not just Spanish-English bilinguals) listed preschool as their primary employment facility. We estimate that 487 ( $6,594 \times .074$ ) Spanish-English bilingual SLPs treat Spanish-English preschoolers. Given that our survey had 90 respondents, we estimate our return rate to be 18.48% (i.e., 90/487). It is unknown how many Spanish-English bilingual SLPs actually treat Spanish-English bilingual preschoolers for the academic talk register. However, the ASHA School Survey (American Speech-Language-Hearing Association, 2014) indicates that the majority (93.10%) of the preschool population who receive SLP services in preschools are treated for articulation and phonological disorders. Therefore, we think our estimated return rate of 18.48% is very conservative.

The 90 SLPs meeting our inclusion criteria were predominately female (85 females, or 94.44%) with a mean age of 41.43 years ( $SD = 10.30$  years, low = 25 years, high = 64 years). Almost all of the respondents held a master's degree in SLP as their highest degree while only two respondents held a doctoral degree as their highest degree. The respondents had treated children who were Spanish-English bilinguals for an average of 10.94 years ( $SD = 7.16$ , low = 3 years, high = 33 years). The majority (85.56%) of the respondents worked in either Head Start or another school setting (i.e., public school, private school) and 97.78% worked with preschoolers

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from low SES backgrounds. Within the last three years, they had treated an average of 35.87 Spanish-English preschoolers ( $SD = 39.18$  preschoolers, low = 2 preschoolers, high = 260 preschoolers) for the academic talk register. They read storybooks aloud to preschoolers on average each week 5.87 times ( $SD = 9.38$  times, low = 0 times, high = 52 times) and they read to an average of 4.40 preschoolers at one time ( $SD = 9.23$  preschoolers, low = 1 preschooler, high = 75 preschoolers).

## **Analysis Plan**

We explored the relationship of the book, SLP, and child factors we identified in the book sharing intervention research using multiple correspondence analysis (MCA, Abdi & Valentin, 2007)—a multivariate technique appropriate for categorical data. MCA was used to determine the major sources of variance in the data and to identify outliers. We used the implementation of MCA in the [R] ExPosition package (Beaton, Chin Fatt, & Abdi, 2014) along with in-house scripts written with the [R] statistical software (R Development Core Team, 2016). MCA represents the relationship between the variables and the variance among individual participants by creating new variables (called factors) that can then be used to plot maps of the data. In these maps, variables close to each other are highly correlated while variables far apart are not correlated.

For the variables in our analysis, we used the following four variables: (a) type of book (i.e., English only, Spanish only, English storybooks translated into Spanish, dual language books, two copies of the same book with one book in each language), (b) the SLP's reading behavior (i.e., read every word, read few to some of the words, use only the illustrations), (c) the number of preschoolers the SLP has treated for the academic talk register, and (d) child factors (i.e., language input the SLP provides the children, whether the children are read to at home). Because MCA analyzes categorical data, we binned our third active variable—the number of preschoolers the SLP has treated for the oral language skills necessary for later text comprehension—into four levels: 1 to 10 preschoolers, 11 to 20 preschoolers, 21 to 49 preschoolers, and 50 to 260 preschoolers (this transformed it into a qualitative variable).

MCA can also plot in these maps supplementary variables (also called “out of sample”) that were not used to compute the factors but whose relationship to the active variables (i.e., the ones used to compute the factors) can

then be assessed. Levels of the supplementary variables that are plotted close together and close to levels of the active variables are interpreted as being highly correlated while variables that are plotted relatively far apart are not correlated. For the supplementary variables in our analysis, we used the following three variables: (a) the SLPs' cultural affiliation (i.e., American, Hispanic, both American and Hispanic), (b) the SLPs' language dominance (i.e., English, Spanish, equal proficiency), and (c) the setting in which the SLP worked (i.e., Head Start program, public and/or private school, private practice and/or home health, other settings).

## **Reliability**

To find meaningful patterns in the data, MCA requires the frequency of levels within categorical variables to be roughly balanced. To meet this requirement, we recoded the response options of five survey questions. The response options for these questions were initially either numeric or in a Likert-type scale with either a four-point or a five-point scale. See the Appendix for the affected questions, their original response scales, and their recoded response scales. Two graduate students, who were blind to the purpose of the study, independently recoded the response scales for the five questions. They achieved perfect reliability (Kappa value of 1) on each recoded response scale.

## **RESULTS**

### **MCA Analysis of the Active Variables**

The variables in our analysis were: (a) type of storybook (i.e., English only, Spanish only, English storybooks translated into Spanish, dual language books, two copies of the same book with one book in each language), (b) the SLP's reading behavior (i.e., read every word, read few to some of the words, use only the illustrations), (c) the number of preschoolers the SLP had treated for the academic talk register, and (d) child factors (i.e., whether the children are read to at home). We had intended to include the type of language input the preschoolers received as one type of child factors. Unfortunately, the levels for this variable were very unbalanced because the majority of the respondents provided more Spanish input than English input. Because MCA is very sensitive to outliers, we decided to treat language input as a supplementary variable. The results of the MCA for the active variables are shown in Figure 1 and the key for the variable abbreviations are shown in Table 1.

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Figure 1. Multiple correspondence analysis of the active variables. The horizontal axis explains 66.43% of the variance. The vertical axis explains 24.26% of the variance. Dark blue = experience; magenta = SLPs' reading behavior; cyan = family read; lime green = book type.

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**Table 1.**  
**Variable abbreviations and names for the SLP, child, and book factors included in the MCAs.**

Abbreviation	Variable Names
<b>Adult variables</b>	
Active variables	
Exp	Experience
2-10.prek	SLPs who have treated two to 10 preschoolers for academic talk (AT).
11-20.prek	SLPs who have treated 12 to 20 preschoolers for AT.
21-49.prek	SLPs who have treated 23 to 42 preschoolers for AT.
50-260.prek	SLPs who have treated 50 to 260 preschoolers for AT.
Read	How SLPs read books aloud
Few.some	SLPs who read only a few to some words, relying mostly on the illustrations.
Every.wd	SLPs who read every word or almost of every word.
Supplementary variables	
Dom	SLPs' dominant language
Eng	SLPs who are dominant in English.
Equal	SLPs who are equally proficient in English and Spanish
Span	SLPs who are dominant in Spanish
Culture	
Amer	SLPs who identify with American culture.
Both	SLPs who identify with both American and Hispanic culture.
Hisp	SLPs who identify with Hispanic culture.
HS	Head Start
Y	SLPs who have served preschoolers for the AT in Head Start programs
N	SLPs who have not.
OS	Other school setting
Y	SLPs who have served preschoolers for AT in other school programs.
N	SLPs who have not.
PP.HH	
Y	SLPs who have served preschoolers for AT in private practice/home health.
N	SLPs who have not.
Other	
Y	SLPs who have served preschoolers for AT in other settings.
N	SLPs who have not.
<b>Child variables</b>	
Active variables	
Family.Rd	Whether the families read aloud to the preschoolers
Y	Yes, the family reads aloud
N	No, the family does not read aloud
Supplementary variables	
Input	Language Input
more.Eng	SLPs who provide children with English input.
Both	SLPs who provide children with both English and Spanish input.
more.Span	SLPs who provide children with Spanish input.
<b>Book variables</b>	
Active variables	
Book	Book Type
Span	Books written in Spanish
Eng	Books written in English
Trans	Books written in English translated into Spanish
2.Dual	Dual language books or One book in English and one in Spanish

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The plotted locations of the factor scores for the active variables are color coded by variable. MCA provides several metrics to use when interpreting the primary and secondary sources of variability. Factor scores, the metric we used, can be positive or negative and indicates the location of the variables on the map. The larger the factor scores, the closer MCA plots the variables towards the extreme ends of the horizontal and vertical axes. For the horizontal axis, the negative factor scores indicate data on the left side of the axis while positive factor scores indicate data on the right side of the axis. For the vertical axis, the negative factor scores indicate data on the bottom part of the axis while positive factor scores indicate data on the top part of the axis.

The map's horizontal axis plots the primary source of variability in the data and represents 66.43% of the total variance of the data. The map's vertical axis plots the second major source of variability in the data and represents 24.26% of the variance. Together, Axes 1 and 2 explain 90.69% of the variance. Variables plotted at the extreme ends of the axes help explain the patterns of variability. Variable factor scores plotted at the center of the graph are commonly occurring and so these do not contribute to the variability in the data.

The primary source of variability (66.43%) represented by the horizontal axis reflects differences in: (a) the SLPs' reading behavior, (b) the number of Spanish-English bilingual preschoolers the SLP has treated for the academic talk register, (c) the type of book SLPs select for read-alouds, (d) whether the family reads aloud to the preschooler. The left side of the horizontal axis is defined by SLPs who have treated between 50 and 260 DLL preschoolers for academic language ( $F = -.16$ ) and who tend to translate children's books written in English into Spanish for read-alouds ( $F = -.26$ ). These SLPs also tended to know that the families of their clients read aloud to them at home ( $F = -.16$ ). The right side of the

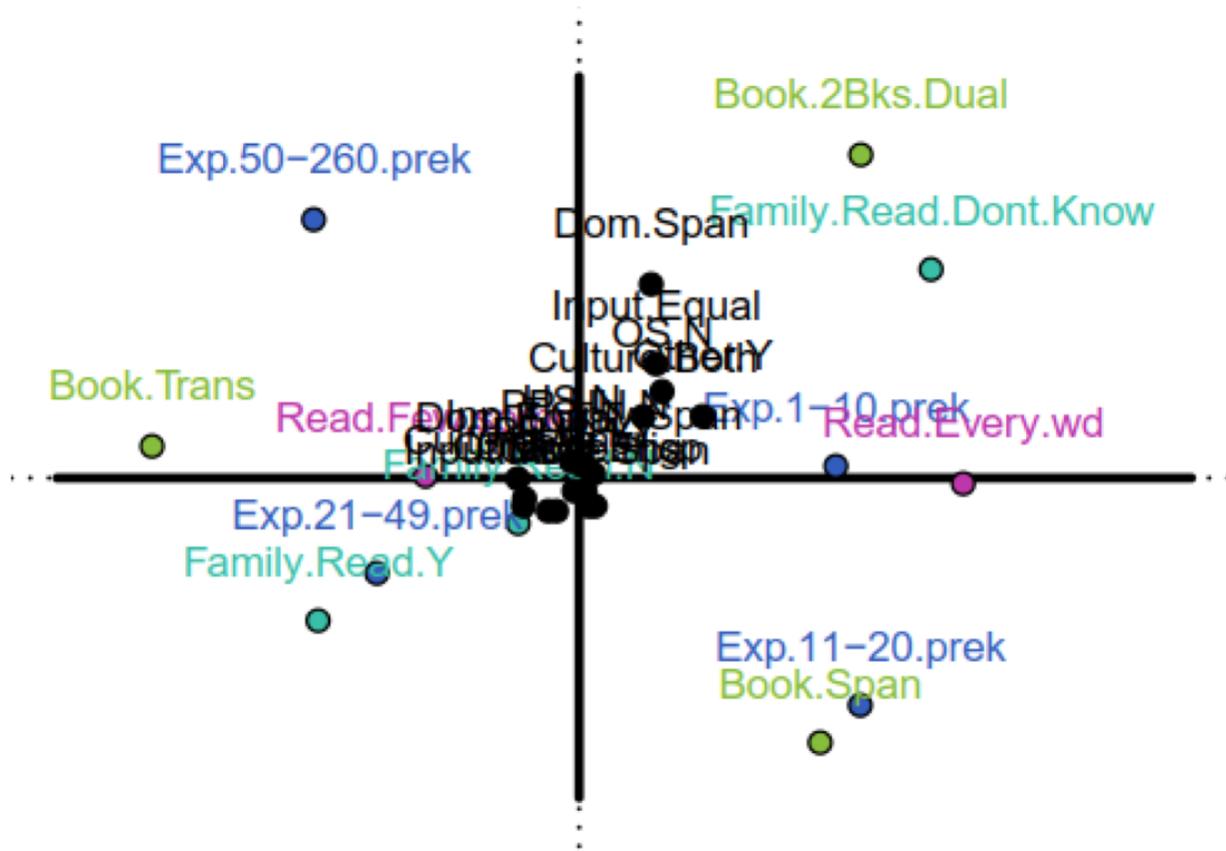
horizontal axis is defined by SLPs who have treated between 12 and 20 DLL preschoolers for academic language ( $F = .17$ ) and who do not know whether the preschoolers are read to at home ( $F = .21$ ). These SLPs tend to use children's books written in Spanish ( $F = .14$ ) and tend to read every word of the text during book-sharing ( $F = .23$ ).

The second source of variability (24.26%) represented by the vertical axis reflects different levels of the same variables mentioned above. The bottom part of the vertical axis is defined by SLPs who have treated between 11 and 20 DLL preschoolers for academic language ( $F = -.14$ ) and who use children's books written in Spanish for read-alouds ( $F = -.16$ ). The top part of the vertical axis is defined by SLPs who have treated between 50 and 260 DLL preschoolers for academic language ( $F = .16$ ) and who tend to use either dual language books or two books (i.e., one in English, one in Spanish) for read-alouds ( $F = .19$ ). These SLPs also did not know whether the preschoolers are read to at home ( $F = .13$ ).

## **MCA Analysis with Supplementary Column Variables**

The supplementary column variables in our analysis were: (a) the SLP's cultural affiliations (i.e., American culture, Hispanic culture, both American and Hispanic cultures), (b) the SLP's dominant language (i.e., English, Spanish, equal proficiency in English and Spanish), (c) the setting(s) in which the SLP works (i.e., Head Start, public or private school, private practice, and other settings), and (d) the type of language input the Spanish-English bilingual preschoolers received (i.e., more Spanish, an equal amount of English and Spanish). The results of the MCA with the supplementary variables projected into the variance space created by the active variables are shown in Figure 2. They are represented by the black dots on the graph.

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**Figure 2. Multiple correspondence analysis with the supplementary variables projected into the variance space created by the active variables. The horizontal axis explains 66.43% of the variance. The vertical axis explains 24.26% of the variance. Dark blue = experience; magenta = SLPs' reading behavior; cyan = family read; lime green = book type; black = all the supplementary variables.**

The majority of the supplementary variables are plotted near the intersection of the two axes and so do not explain the variance created by the active variables, with the exception of (a) the input the SLP provides the preschoolers and (b) the dominant language reported by the SLP. These two variables help explain the secondary source of variability (24.26%) plotted along the vertical axis. At the top of the vertical axis, SLPs who used dual language storybooks or two storybooks of the same story, with one book written in Spanish and one English, reported Spanish as their dominant language ( $F = .12$ ) and provided an equal amount of Spanish and English language input to the preschoolers they served for the academic talk register ( $F = .07$ ).

### **Outliers**

Preliminary MCA analyses identified five respondents as outliers, which we excluded from the analyses shown in Figures 1 and 2. Four of the respondents were the only respondents in the study to provide more English input than Spanish input. Two of these SLPs used books written in English while the other two used books written in Spanish. The fifth outlier was a respondent who provided Spanish input and translated books written in English into Spanish but used only the illustrations to tell the story during book-sharing sessions.

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## **DISCUSSION**

Although the literature often states that the adult, the book, and the child interact (Martinez & Roser, 1985; Sulzby & Teale, 1987; van Kleeck, 2014), the complexities of these interactions have not been analyzed for practicing Spanish-English bilingual SLPs who use book sharing in language intervention. Book-sharing can be used clinically for several purposes (Justice & Kaderavek, 2004; van Kleeck, 2006a). Our specific interest here was in how Spanish-English bilingual SLPs use books to increase the academic talk register, which is the register naturally occurring in mainstream American families and the register used in U.S. schools to acquire knowledge and display knowledge (van Kleeck, 2006a, 2006b, 2014; van Kleeck & Schwarz, 2011). The academic talk register is a more formal use of language than talk used in casual conversation. It includes about 60% of talk that places relatively low cognitive demands and about 40% of talk that places relatively high cognitive demand on preschoolers. The vocabulary includes some relatively long and morphologically complex words that are common in written but not conversational language (Beck et al., 2013; van Kleeck, 2014). Sentences are relatively long and include pronouns referring to the linguistic context instead of just to the physical context.

The published school-based and home-based intervention studies that included book sharing identified several adult, child, and book factors that were likely important to the book-sharing interventions Spanish-English SLPs use with preschoolers. The SLP factors were: (a) how the SLPs read the story, (b) their language dominance, and (c) their cultural affiliation. We added to these the setting in which the SLP worked and the number of Spanish-English DLL preschoolers they had treated for the academic talk register. The book factor was the language version of the books, which included whether the books were translated from English to Spanish. The child factors were: (a) the type of language input the child received and (b) whether they were read to at home regularly.

Our results indicate two key findings that concern the language input DLL preschoolers receive, type of book used, and how the SLP reads the story. We found that the majority of bilingual SLPs in our study provide Spanish input to the preschoolers they serve for the academic talk register. The largest pattern in the data (66.43% explained variance) concerns the type of book and how the SLP reads the book during the Spanish intervention. SLPs who

used books written in Spanish tended to read every word of the text whereas SLPs who translated English books into Spanish tended to read few to some of the words and rely more on the illustrations.

The second largest pattern in the data (24.26% explained variance) concerns the type of book, the type of input the child received, and whether the child was read to at home. SLPs who used dual language or two books (one in Spanish and one in English) provided the children with equal amounts of Spanish and English input. Only the SLPs who translated English books into Spanish knew whether the preschoolers were read to at home.

## **Clinical Implications**

We were surprised to find that (a) many of the Spanish-English bilingual SLPs in our study did not know whether the DLL preschoolers they serve were read to at home and (b) that many of these SLPs translate English books into Spanish for language therapy. The home-based book-sharing intervention studies that provided DLL preschoolers with mostly or only Spanish input show that using commercially available books in an intervention that places some relatively high cognitive demands on preschoolers are only successful if book sharing is an established family practice (Brannon & Dauksas, 2014; Rodriguez-Brown & Mulhern, 1993). DLL preschoolers who are not familiar with book sharing may not know how to respond and, so, may not respond adequately to the SLPs' requests for predictions, inferences, and definitions of key vocabulary. In other words, the SLPs' data may under-represent or misrepresent what DLL preschoolers can actually do (Quiroga, Lemos-Britton, Mostafapour, Abbott, & Berninger, 2002; Schick, 2015). Therefore, we suggest SLPs ask their clients' caregivers about the book sharing practices in the home to determine whether book sharing is an appropriate activity to begin working on the academic talk register. By using the internet search terms "home literacy survey parents," practicing clinicians can find several freely available home literacy surveys that they can use to determine whether book sharing is an appropriate activity for building the academic talk register.

If DLL preschoolers are not read to at home, we suggest that SLPs not use commercially available books for this purpose. Below, we have listed several alternative activities that the SLPs in our study use to treat the academic talk register.

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- Create narratives with repeated themes and higher level vocabulary based on semi-structured play with toys.
- Create barrier games that incorporate higher level vocabulary.
- Make predictions while playing board games.
- Use culturally appropriate photographs to create stories with higher level vocabulary.
- Use video.
- Use cause and effect cards.
- Make predictions during crafts and cooking activities.
- Use sequencing cards that include cards with alternative endings.

We were also surprised to learn that Spanish-English bilingual SLPs are translating English books into Spanish. We wonder how translating books effects the SLPs' ability to model and elicit the academic talk register. Specifically, what happens to the higher-level vocabulary and morphologically complex words in translation? Does the sentence length shorten and the sentence structure become less complex in translation? Although we could not find studies directly addressing these questions, studies on the different types of oral translation and critiques of written translations of storybooks provide some insight.

There are different ways to translate information, including simultaneous translation, consecutive translation, and paraphrasing (Christoffels & De Groot, 2004). In simultaneous translation, the interpreter switches between two languages, simultaneously processing one language and verbally producing the other. This means that both languages are activated at the same time. In consecutive translation, the interpreter processes a phrase in one language and then translates that whole phrase into the other language. This means that only one language is activated at a time, which presumably makes the task somewhat less cognitively demanding for the interpreter (Christoffels & De Groot, 2004). A similarity between simultaneous and consecutive translation is that the interpreter tries to find grammatically equivalent sentence structures to those in the source information. However, neither type of translation is able to give a word-for-word translation because languages generally differ in word order (Christoffels & De Groot, 2004).

In paraphrasing, the interpreter relays the basic meaning of the information but uses different words and sentence structure than was present in the source. This means that the interpreter has to comprehend the message before reformulating it into the other language. Paraphrasing also places a high vocabulary demand on the interpreter because the paraphraser often retrieves synonyms of words contained in the source information (Christoffels & De Groot, 2004).

When Christoffels and DeGroot (2004) compared these three types of translation on sets of recorded sentences, they found that when interpreters paraphrased information, the meaning of the sentences was compromised more than when interpreters simultaneously and consecutively translated the information. Christoffels and DeGroot (2004) suggest that paraphrasing is more difficult than the other two conditions because the paraphraser changes the grammatical structure of the content instead of finding a grammatical equivalent of the information being translated. Recall that the SLPs in our study who translated books written in English into Spanish read few to some of the words in the text. We surmise from this that these SLPs were either engaged in consecutively translating or paraphrasing the children's books. Regardless of the translation method used, vocabulary and sentence structure are both affected in some way.

Creating written translations of picture books poses a more complex challenge than translating sentences for two reasons that relate directly to the academic talk register. First, the translator has to maintain the relationship between information contained in the text and in the illustrations. (Oittinen, 2003). For example, when the book is translated, do the illustrations provide the same level of support to the text as the original text did (Oittinen, 2003)? If the illustrations provide more support, there will be less opportunity for the children to make predictions and inferences about the story. Second, the sentence structure of translated picture books is often very different from the original. In her analysis of three written translations (German, Finnish, and Swedish) of Sendak's (1964) *Where the Wild Things are* penned by professional translators, Oittinen (2003) found that the translators consistently shortened sentences and reduced the complexity of sentences in comparison to the original English version of the book. With professional translators struggling to balance the information between text and illustrations as well as maintaining sentence complexity

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after spending hours creating translations for one book, we doubt that practicing clinicians with large caseloads can adequately attend to these issues when translating books for therapy. For these reasons, we suggest bilingual SLPs use one or more of the alternative activities listed above in place of using translated books.

## **Study Limitations**

There are three major limitations of our study. First, it is currently unknown how many bilingual SLPs treat DLL preschoolers for the academic talk register. Given that the data published by ASHA's Office of Multicultural Affairs, we contend that our estimated return rate of 18.48% is conservative. Given the later reading achievement and overall school success (Scheele et al., 2012) is strongly associated with children's command of the academic talk register, we hope ASHA's Office of Multicultural Affairs will modify its existing survey instrument to include the percentages of SLPs who treat preschoolers and school-aged children for the academic talk register.

Second, we did not ask the SLPs about whether they were using books with a narrative arch or expository texts when treating for the academic talk register. Although this is an important question and the information would have been nice to have, we did not ask this question because we did not see how the distinction between narrative and expository texts would interact in a materially different way with the adult and child factors of interest in this study.

Third, we did not ask the SLPs how they translated the books. Were they writing out a translation of the stories, silently reading a sentence in English and simultaneously orally translating it (simultaneous translation) into Spanish, reading a sentence in English and then translating it into Spanish (consecutive translation), or reading a block of text (e.g., paragraph) and paraphrasing the content? We chose to not ask this question in the survey because we thought the way SLPs translate books would depend on the difficulty of the text. For example, if an SLP was translating Eric Carle's (1987) *Very Hungry Caterpillar*, the SLP might attempt to translate the book simultaneously or consecutively because the text includes relatively short sentences with simple vocabulary. However, if the SLPs were translating Piper's (1990) *Little Engine that Could*, which contains lots of text per page with complex sentences and complex vocabulary, the SLPs might paraphrase blocks of text to relay the

meaning of the passage. As discussed next, we think this issue is better treated in a different kind of study than in a survey.

## **Future Studies**

There are two related lines of research emerging from our survey. One line will focus on whether the degree of challenge present in the vocabulary and syntax of children's books written in English is maintained when the books are translated into Spanish. We will look at this question across texts with different levels of difficulty and across different types of translation (i.e., written, simultaneous, consecutive, paraphrasing). If the degree of challenge in vocabulary and syntax is compromised in translation, Spanish-English bilingual SLPs could be providing DLL preschoolers with language more aligned with the casual talk register than the academic talk register.

The related line of research will examine how Spanish to English translation of children's books during book sharing sessions affects the cognitive challenge of the extra-textual talk bilingual SLPs provide DLL preschoolers. We also will look at this question across the difficulty level of books and the different types of translation. We hypothesize that as the cognitive challenge facing the SLPs increases, they will produce extra-textual talk more aligned with the casual talk register than the academic talk register. The purpose of both lines of research is to produce evidence-based guidelines that bilingual SLPs can use when translating English books for language therapy meant to increase preschoolers' use of the academic talk register.

## **Conclusion**

Although the interaction of the book, the adult, and the child in monolingual book sharing is complex, the interaction of these factors in bilingual book sharing is vastly more complex. The results from this study clearly identify which SLP, book, and child factors interact in the academic language interventions Spanish-English bilingual SLPs provide DLL preschoolers. It is incumbent upon SLPs to find out whether the DLL preschoolers are read to at home. If they are not, we suggest that the SLPs use other activities to increase the academic talk register. We also suggest that SLPs refrain from translating English books into Spanish because it is unknown how translation affects the quality and quantity of cognitively demanding extra-textual talk that is the hallmark of the

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academic talk register. In future studies, we will determine whether and how the process of translating books compromises the text of children's books and the extra-textual talk bilingual SLPs provide the DLL preschoolers they treat.

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## **REFERENCES**

- Abdi, H., & Valentin, D. (2007). Multiple correspondence analysis. In N. J. Salkind (Ed.), *Encyclopedia of measurement and statistics* (pp. 657-663). Thousand Oaks, CA: Sage.
- American Speech-Language-Hearing Association. (2008). Roles and responsibilities of speech language pathologists in early intervention guidelines Retrieved August 27, 2016, from [www.asha.org/policy](http://www.asha.org/policy)
- American Speech-Language-Hearing Association. (2014). 2014 Schools survey. Survey summary report: Number and type of responses, SLPs Retrieved July 28, 2016, from [www.asha.org](http://www.asha.org)
- American Speech-Language-Hearing Association. (2016). Demographic profile of ASHA members providing bilingual services: March 2016, from <http://www.asha.org/uploadedFiles/Demographic-Profile-Bilingual-Spanish-Service-Members.pdf>
- Anderson, J., Anderson, A., Lynch, J., & Shapiro, J. (2003). Storybook reading in a multicultural society: Critical perspective. In A. van Kleeck, S. A. Stahl & E. B. Bauer (Eds.), *On reading books to children* (pp. 203-230). New York, NY: Routledge.
- Baker, A., Piotrkowski, C. S., & Brooks-Gunn, J. (1998). The effects of the home instruction program for preschool youngsters (HIPPO) on children's school performance at the end of the program and one year later. *Early Childhood Research Quarterly*, *13*, 571-588.
- Barrera, R. B., & Bauer, E. B. (2003). Storybook reading and young bilingual children: A review of the literature. In A. van Kleeck, S. A. Stahl & E. B. Bauer (Eds.), *On reading books to children: Parents and teachers* (pp. 253-267). New York, NY: Routledge.
- Beaton, D., Chin Fatt, C. R., & Abdi, H. (2014). An ExPosition of multivariate analysis with the singular value decomposition in R. *Computational Statistics & Data Analysis*, *72*, 176-189. doi: 10.1016/j.csda.2013.11.006
- Beck, I. L., McKeown, M. G., & Kucan, L. (2013). *Bringing words to life: Robust vocabulary instruction* (2nd ed.). New York, NY: Guilford Press.
- Bernstein, B. (1964). Elaborated and restricted codes: Their social origins and some consequences. *American Anthropologist*, *66*, 55-69.
- Boyce, L. K., Innocenti, M. S., Roggman, L. A., Jump Norman, V. K., & Ortiz, E. (2010). Telling stories and making books: Evidence for an intervention to help parents in migrant Head Start families support their children's language and literacy. *Early Education and Development*, *21*, 343-371. doi: 10.1080/10409281003631142
- Brannon, D., & Dauksas, L. (2014). The effectiveness of dialogic reading in increasing English language learning preschool children's expressive language. *International Research in Early Childhood Education*, *5*, 1-10.
- Carle, E. (1987). *The very hungry caterpillar*. New York, NY: Philomel.
- Christoffels, I. K., & De Groot, A. M. B. (2004). Components of simultaneous interpreting: Comparing interpreting with shadowing and paraphrasing. *Bilingualism*, *7*, 227-240. doi: 10.1017/S1366728904001609
- Dickinson, D. K., & Smith, M. W. (1994a). Long-term effects of preschool teachers' book readings on low-income children's vocabulary and story comprehension. *Reading Research Quarterly*, *29*(2), 104-122.

# *Journal of the National Black Association for Speech-Language and Hearing*

- Dickinson, D. K., & Smith, M. W. (1994b). Long-term effects of preschool teachers' book readings on low-income children's vocabulary and story comprehension. *Reading Research Quarterly*, 29, 104-122.
- Eldridge-Hunter, D. (1992). Intergenerational literacy: Impact on the development on the storybook reading behaviors of Hispanic mothers. In C. K. Kinzer & D. L. Leu (Eds.), *Literacy research theory, and practice: Views from many perspectives. Forty-first yearbook of the National Reading Conference* (pp. 101-110). Chicago, IL: National Reading Conference.
- Ezell, H. K., Gonzales, M. D., & Randolph, E. (2000). Emergent literacy skills of migrant Mexican American preschoolers. *Communication Disorders Quarterly*, 21, 147-153.
- Gadsen, V. L. (2004). Family literacy and culture. In B. H. Wasik (Ed.), *Handbook of family literacy* (pp. 349-370). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Hammer, C., Nimmo, D., Cohen, R., Draheim, C., & Johnson, A. (2005). Book reading interactions between African American and Puerto Rican Head Start children and their mothers. *Journal of Early Childhood Literacy*, 5, 195-227. doi: 10.1177/1468798405058683
- Ijalba, E. (2015). Effectiveness of a parent-implemented language and literacy intervention in the home language. *Child Language Teaching and Therapy*, 31, 207-220. doi: 10.1177/0265659014548519
- Janes, H. A., & Kermani, H. (2001). Caregivers' story reading to young children in family literacy programs: Pleasure or punishment? *Journal of Adolescent & Adult Literacy*, 44, 458-465.
- Justice, L., & Kaderavek, J. (2004). Embedded-explicit emergent literacy intervention 1: Background and description of the approach. *Language, Speech, and Hearing Services in the Schools*, 35, 201-211.
- Kermani, H., & Janes, H. A. (1997). *Problematising family literacy: Lessons learned from a community-based tutorial program for low-income Latino families*. Paper presented at the American Educational Research Association, Chicago, IL. <http://files.eric.ed.gov/fulltext/ED408380.pdf>
- Leacox, L., & Jackson, C. W. (2014). Spanish vocabulary-bridging technology-enhanced instruction for young English language learners' word learning. *Journal of Early Childhood Literacy*, 14, 175-197. doi: 10.1177/1468798412458518
- Lugo-Neris, Jackson, C. W., & Goldstein, H. (2010). Facilitating vocabulary acquisition in young English language learners. *Language, Speech, and Hearing Services in the Schools*, 41, 314-327.
- Martinez, M., & Roser, N. (1985). A case study of the effects of selected text factors on parent-child story time interactions. In J. A. Niles & R. V. Lalik (Eds.), *Issues in literacy: A research perspective, Thirty-fourth yearbook of the National Reading Conference* (pp. 168-174). Chicago, IL: National Reading Conference, Inc.
- McGee, L. M., & Schickedanz, J. A. (2007). Repeated interactive read-alouds in preschool and kindergarten. *The Reading Teacher*, 60(8), 742-751.
- O'Brien, L. M., Paratore, J. R., Leightop, C. M., Cassano, C. M., Krol-Sinclair, B., & Greif Green, J. (2014). Examining differential effects of a family literacy program on language and literacy growth of English language. *Journal of Literacy Research*, 46, 383-415. doi: 10.1177/1086296X14552180
- Oittinen, R. (2003). *Where the Wild Things Are: Translating picture books*. *Meta: Translators' Journal*, 48, 128-141. doi: 10.7202/006962ar
- Pellegrini, A. D., Brody, G. H., & Sigen, I. E. (1985). Parents' book-reading habits with their children. *Journal of Educational Psychology*, 77, 332-340.
- Piper, W. (1990). *The little engine that could*. New York, NY: Grosset & Dunlap.
- Pollard-Durodola, S. D., Gonzalez, J. E., Saenz, L., Soares, D., Resendez, N., Kwok, O., . . . Zhu, L. (2016). The effects of content-related shared book reading on the language development of preschool dual language learners. *Early Childhood Research Quarterly*, 36, 106-121.

# *Journal of the National Black Association for Speech-Language and Hearing*

- Quiroga, T., Lemos-Britton, Z., Mostafapour, E., Abbott, R. D., & Berninger, V. W. (2002). Phonological awareness and beginning reading in Spanish-speaking ESL first graders: Research into Practice. *Journal of School Psychology, 40*, 85-111.
- R Development Core Team. (2016). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.
- Restrepo, M. A., Castilla, A. P., Schwanenflugel, P. J., Neuharth-Pritchett, S., Hamilton, C. E., & Arboleda, A. (2010). Effects of a supplemental Spanish oral language program on sentence length, complexity, and grammaticality in Spanish-speaking children attending English-Only preschools. *Language, Speech, and Hearing Services in the Schools, 41*, 3-13.
- Roberts, T. A. (2008). Home storybook reading in primary and secondary language with preschool children: Evidence of equal effectiveness for second-language vocabulary acquisition. *Reading Research Quarterly, 43*, 103-130. doi: 10.1598/RRQ.43.2.1
- Roberts, T. A., & Neal, H. (2004). Relationships among preschool English language learner's oral proficiency in English, instructional experience and literacy development. *Contemporary Educational Psychology, 29*, 283-311. doi: 10.1016/j.cedpsych.2003.08.001
- Rodriguez-Brown, F. V., & Mulhern, M. M. (1993). Fostering critical literacy through family literacy: A study of families in a Mexican-immigrant community. *Bilingual Research Journal, 17*, 1-16.
- Scheele, A. F., Leseman, P. P. M., Mayo, A. Y., & Elbers, E. (2012). The relation of home language and literacy to three-year-old children's emergent academic language in narrative and instruction genres. *The Elementary School Journal, 112*, 419-444. doi: 10.1086/663300
- Schick, A. (2015). Wordless book-sharing styles in bilingual preschool classrooms and Latino children's emergent literacy skills. *Journal of Early Childhood Literacy, 15*, 331-363. doi: 10.1177/1468798414551942
- Sendak, M. (1964). *Where the Wild Things are*. New York, NY: HarperCollins Publisher.
- Silverman, R. D., Crandell, J. D., & Carlis, L. (2013). Read alouds and beyond: The effects of read aloud extension activities on vocabulary in Head Start classrooms. *Early Education and Development, 24*, 98-122.
- Sulzby, E., & Teale, W. H. (1987). *Young children's storybook reading: Longitudinal study of parent-child interaction and children's independent functioning*. The final report to the Spencer Foundation. Ann Arbor, MI: The University of Michigan.
- Tsybina, I., & Eriks-Brophy, A. (2010). Bilingual dialogic book-reading intervention for preschoolers with slow expressive vocabulary development. *Journal of Communication Disorders, 43*, 538-556. doi: 10.1016/j.jcomdis.2010.05.006
- van Kleeck, A. (2003). Research on book sharing: Another critical look. In A. van Kleeck, S. A. Stahl & E. B. Bauer (Eds.), *On reading book to children: Parents and teachers* (pp. 271-320). New York, NY: Routledge.
- van Kleeck, A. (2006a). Cultural issues in promoting interactive book sharing in the families of preschoolers. In A. van Kleeck (Ed.), *Sharing books and stories to promote language and literacy* (pp. 179-230). San Diego, CA: Plural Publishing.
- van Kleeck, A. (2006b). Fostering inferential language during book sharing with prereaders. In A. van Kleeck (Ed.), *Sharing books and stories to promote language and literacy*. San Diego, CA: Plural Publishing, Inc.
- van Kleeck, A. (2014). Distinguishing between casual talk and academic talk beginning in the preschool years: An important consideration for speech-language pathologists. *American Journal of Speech Language Pathology, 23*, 724-741.
- Van Kleeck, A., Gillam, R. B., Hamilton, L., & McGrath, C. (1997). The relationship between middle-class parents' book-sharing discussion and their preschoolers' abstract language development. *Journal of Speech Language and Hearing Research, 40*, 1261-1271.

# *Journal of the National Black Association for Speech-Language and Hearing*

- van Kleeck, A., & Schwarz, A. L. (2011). Making “academic talk” explicit: Research directions for fostering classroom discourse skills in children from nonmainstream cultures. *Revue Suisse des Sciences de l'Éducation*, 33, 1-18.
- van Kleeck, A., Stahl, S. A., & Bauer, E. B. (2003). *On reading books to children: Parents and teachers*. New York, NY: Routledge.
- Wasik, B. H., Dobbins, D. R., & Hermann, S. (2001). Intergenerational family literacy: Concepts, research, and practice. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy development* (Vol. 1, pp. 444-458). New York, NY: Guilford.
- Wessels, S. (2014). Supporting English and Spanish literacy through a family literacy program. *School Community Journal*, 24, 147-163.
- Whitehurst, G. J., Crone, D. A., Zevenbergen, A. A., Schultz, M. D., & Velting, O. N. (1999). Outcomes of an emergent literacy intervention from Head Start through second grade. *Journal of Educational Psychology*, 91(2), 261-272.

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1 **Appendix: Summary of Recoded Survey Question Response Scales**

Recoded Survey Questions	Original Scale	Recoded Scale
Of the total number of Spanish-English bilinguals you treated in the last 3 years for the oral language skills that are necessary for later text comprehension, how many were <i>preschoolers</i> ?	Numeric	2-10 preschoolers 12-20 preschoolers 23-42 preschoolers 50-260 preschoolers
In the last 3 years when you read books aloud to the preschool Spanish-English bilinguals you treated for the oral language skills that are necessary for later text comprehension, which category below best describes the type of storybook you used:	Spanish books English books Translated books Dual language books One English book & one Spanish book	Spanish books English books Translated books Dual language books or 2 books
In the last 3 years when you read books aloud to the preschool Spanish-English bilinguals you treated for the oral language skills that are necessary for later text comprehension, which category best describes how you read the books aloud:	Every word or almost every word Some text Few words Illustrations only	Every word or almost every word Few to some words Illustrations only
During the last 3 years, which category best describes your cultural identification?	Strongly Hispanic culture Moderately Hispanic culture Both Hispanic and American culture Moderately American culture Strongly American culture	Hispanic culture Both Hispanic & American cultures American culture
Of the total number of preschool Spanish-English bilinguals you treated for the oral language skills that are necessary for later text comprehension during the last 3 years, how often did you treat these children in the following settings? The settings were Head Start, other schools, private practice and/or home health, and other settings, which included community clinics, university clinics, and any other setting we did not list.	Very often Often Not often Never	Yes (treated in this setting) No (did not treat in this setting)

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## *INFLUENCE OF AGE OF ACADEMIC L2 EXPOSURE ON MAZE USE IN BILINGUAL ADULTS*

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### **ABSTRACT**

This study examined the influence of age of academic second language (L2) exposure on mazes. Seventeen bilingual adults, varying in ages of initial academic L2 exposure and proficiency, formed two groups. Participants described three culturally-calibrated pictures in L2. From their narratives, pauses, repetitions, and revisions were measured. A time domain measure, empty pause, was sensitive to L2 exposure and proficiency. Fewer empty pauses were used by bilinguals with higher L2-proficiency. The influence of cognitive-linguistic processing was discussed. Overgeneralizing the findings is cautioned as the target languages, nature of the participants, language proficiency of the bilinguals, and the tasks may vary across studies.

**KEYWORDS:** Bengali; Bilingualism; Maze; Picture description; Proficiency; Pauses

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## **INTRODUCTION**

**H**istorically, in spite of methodological variability across studies with bilingual speakers, there is a popular belief that an early age of exposure to a second language or L2 has an independent and isolated advantage on speakers' L2 production. While some studies have used maturational constraints as an explanatory device (e.g., Johnson & Newport, 1989; Long 1990; Pinker 1994), other studies have recommended against overdependence on the maturational account by reporting post-maturational age effects (Bialystok & Hakuta, 1999; Birdsong, 1992; Flege, Yeni-Komshian & Liu, 1999; Han & Odlin, 2004; Munoz & Singleton, 2011) and have argued against overgeneralization of the strong position of maturational account. Flege et. al., (1999) have suggested that the nature of the native language or L1 and L2, as well as the amount and quality of the input, are also critical variables in the ultimate attainment of native-like L2 (see, Birdsong & Molis, 2001). Singleton (1989) analyzed extensive data and suggested that, despite an initial advantage for the older learners in L2, younger learners were at an advantage in the long run. Regardless of the underlying mechanism involved in L2 speech production, it is usually accepted that early exposure to an L2 offers advantages to bilinguals in all linguistic tasks and even in minimizing production of mazes.

Bilingual adults offer an interesting test case for/of since they function at an advanced level of motor speech and L1 acquisition, but vary in L2 proficiency. Producing two languages might impose a higher cognitive load than acquiring and producing only one language (Edmunds, 2006; Gutiérrez-Clellen & Kreiter, 2003; Silva-Corvalan, 1994). For example, a story-telling task demands conceptualizing the narrative, and requires a substantial amount of attentional resources (Levelt, 1989). The complexity of the picture content, proficiency in the target language, and the nature of the task all likely impose a processing load on speakers' linguistic system. Any increase in processing load might disrupt the normal speech production mechanism, of which mazes may be an example. In this paper, we discuss the influence of L2 proficiency on maze production in bilingual adults.

### **Maze production**

Mazes are interruptions in the forward flow of speech that occur in all speakers. Usually, mazes are described as "...a series of words (or initial parts of words), or unattached fragments which do not constitute a communication unit and are not necessary to the communication unit" (Loban, 1976, p. 22). Production of mazes may be used as an index of language development and proficiency (Loban, 1976). Mazes could be speaker-dependent, content-sensitive, language-specific, or even dialect-specific (e.g., Cruttenden, 1986; Nippold, 2007; Swerts, 1998). Production of mazes indicates a speaker's uncertain response to the demands of language processing and is a consequence of the speaker's covert repair activity while monitoring through the perceptual-loop, surfaced overtly through revisions, pauses, and/or repetitions (Levelt, 1989). Mazes are reported to be byproducts of three independent control functions: (1) attempt to control the context-ambiguity of the message; (2) attempt to control the establishment of syntactic and phonological patterns; and (3) attempt to control the relationship between a speaker's linguistic intention and overt utterances (Fletcher, 1990; Levelt, 1989; Navarro-Ruiz & Rallo-Fabra, 2001). As a consequence of repair activity in production adjustments, listeners hear pauses, repetitions, and revisions, affecting all possible linguistic constructs including phonology, morphology, syntax, and semantics (e.g., Lennon, 1990; Navarro-Ruiz & Rallo-Fabra, 2001; Postma, Kolk & Povel, 1990; Poullisse, 1999), along with the neurophysiological processes involved in speech production mechanisms (e.g., Fletcher, 1990; Levelt, 1989; Navarro-Ruiz & Rallo-Fabra, 2001).

### **Maze Use and Maze Types**

All speakers produce mazes to some degree (Bedore, Fiestas, Pena, & Nagy, 2006; effect sizes ranged from .000001 to .063). Increased use of mazes might reflect not only language learning and production difficulty (Levelt, 1989; Levelt, 1999) but could also be a marker for lower proficiency in language and for impairment in language (Bedore, et al., 2006; Leadholm & Miller, 1995; Loban, 1963; Nippold, 1993). Bilinguals produce more mazes than monolinguals, more mazes in their non-dominant language (which is not necessarily their L2) (Sandoval, Gollan, Ferreira, & Salmon, 2010), and more in L2 than in their L1 (Gleitman, Gleitman & Shipley, 1972; Gollan, Montoya, Cera, & Sandoval 2008; Ivanova & Costa,

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2008; Lennon, 1990; Poullisse, 1999; Rieger, 2003; Wiese, 1984).

However, mazes should not be always considered a marker of reduced language proficiency. To enhance interactive quality, media professionals prefer to speak spontaneously, with unusual hesitations deliberately infused during interviews, rather than reading from a list (Swerts, 1998). Mazes shed light on the production process and have critical value in the overall discourse function (Fromkin, 1973, 1980; Goldman-Eisler, 1968; Levelt & Cutler, 1983; Nooteboom, 1973). Words following mazes have low transitional probability, and thus have potentially high information value (Goldman-Eisler, 1968). For listeners, pauses, which are a type of maze, may offer pre-signals to an upcoming important linguistic content (e.g., Fox-Tree, 1995; Shriberg & Stolcke, 1996). Hence, 'spontaneous' speech should not be always equated with potentially 'functionally inadequate' speech (Kowal, Bassett & O'Connell, 1985) if it contains mazes, because mazes occasionally go unnoticed (e.g., Lickley & Bard, 1996).

Researchers have identified several types of mazes. For example, empty pause (i.e., silent intervals, two or more seconds in length; Nettelbladt & Hansson, 1999), filled pause (i.e., non-linguistic vocalization at the beginning of utterances or between words (Bedore, et. al., 2006)), sound repetition (i.e., repeating a phoneme), part-word repetition, whole-word repetition, phrase repetition, phrase revisions, lexical revisions, and grammatical revisions and connectors (i.e., repetitive use of conjunctions or time markers at the beginning of utterances).

Specifically, pauses and other hesitation phenomena are reported to be one of the detrimental variables that minimize speech intelligibility in a second language, and have also been linked to negative evaluations from listeners (Albrechsten, Henriksen & Faerch, 1980; Bosker, 2014; Pickering, 1999; Olynyk, d'Anglejan & Sankoff, 1987; Reed 2000). Mastering the language-specific use of pauses and hesitation phenomena, especially in L2, could be challenging (Nakajima & Allen, 1993; Swerts & Geluykens, 1994). From the listeners' perspective, pause length and pause placement are known to be associated with speech comprehensibility (Corley, MacGregor, & Donaldson, 2007; Fehringer & Fry, 2007; Nakajima & Allen, 1993; Swerts & Geluykens, 1994). However, mazes, as a critical index of linguistic

processing in bilingual adults, have not received sufficient empirical attention in bilingualism (Cenoz, 1998) or speech-language pathology (Bedore et al., 2006).

Language-specific maze frequency has been reported by Edmunds (2006) where he concluded that the semantic load, the length of words, and the level of grammaticization have influenced the rate and type of mazes, as, most likely, speakers were trying to minimize their cognitive loads. Speakers who speak more than one language might exhibit some disadvantage in different language production constructs (Sandoval et al., 2010). Speakers might use mazes when they encounter difficulty finding target words or constructions.

Based on vocabulary knowledge and speech production disfluencies, researchers have reported a bilingual disadvantage in some work (Bialystok, 2001; Bialystok, Luk, Peets, & Yang, 2010; Gollan & Acenas, 2004; Gollan, Montoya, & Bonanni, 2005; Gollan, Montoya, & Werner, 2002; Gollan & Silverberg, 2001). For example, even though the main focus of her work is the advantage of bilinguals over monolinguals in other areas, in particular executive function, some studies (Bialystok, 2001; Bialystok et al., 2010) have reported lower vocabulary-knowledge-scores for bilinguals in each language than for monolingual speakers of that language across the lifespan. In tasks that require rapid lexical access and retrieval, disadvantages have also been documented for bilingual adults; they exhibited relatively slower response time and committed more errors in picture naming even in their dominant language, obtained lower scores on verbal-fluency tasks, experienced more tip-of-the-tongue statements and demonstrated more interference in lexical decision tasks (Michael & Gollan, 2005). The nature of utterance complexity and L1 versus L2 are also known to influence maze production with more mazes observed in complex sentences than in simple sentences in both L1 and L2, but more in L2 (Eckert, 1990; Hopper, 2014). Thus, in a bilingual population, pervasive disfluencies as a potential index of increased processing load are not rare (Bialystok, 2001; Bialystok et al., 2010); mazes could be reflections of such disfluencies.

## **Purpose of the Current Study**

Adults with early L2 exposure have a different nature of linguistic experience compared to speakers with late L2 exposure. For example, the frequency of L2 input and motoric practice, neurolinguistic processes in L2 and

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social usage of L2-related behaviors all clearly differentiate the two groups in the long run. Variations in linguistic experience induce variations in language processing, which in turn, could create potential variations in maze behaviors. The current paper explores the relationship between age of initial L2 exposure, L2 proficiency and mazing behaviors through spoken narratives of bilingual adults in their non-dominant language, L2.

The current study compared maze use in adults who have Bengali as their first language (L1) and English as L2 but who differed in their initial age of academic exposure (early vs. late) to L2, English. The type of mazes used may shed light on how the age of academic L2 exposure and L2 proficiency relate to dysfluencies. The Bengali – English bilingual adults offer an interesting test case as mazes used in English by speakers from the post-colonial environment of the Indian subcontinent have never been reported. Examining the following three questions, we attempt to understand how L2 proficiency and mazes interact in adult bilingual speakers: 1) Does frequency of maze use vary as a function of L2 proficiency? 2) Do patterns of specific maze type (e.g., pauses, repetitions, revisions etc.) vary as a function of L2 proficiency? 3) Do patterns of maze behavior vary as a function of stimuli type?

## **METHODS**

### **Participants**

Seventeen bilingual adults participated (ages ranged from 24 years to 40 years;  $M = 28.71$ ; 9 females, 8 males) with Bengali as their L1 and English as their L2. Of the seventeen unpaid volunteers, nine had a history of early academic exposure to English (beginning at elementary school age) and raw scores 17-25,  $M=20.6$ ,  $SD=3.75$  on the *Test of Adolescent and Adult Language-Third Edition* (TOAL-3) (Hammill, Brown, Larsen, & Wiederholt, 1994) that indicated high proficiency; henceforth they are known as the early/high group. The remaining eight participants had late academic exposure to English (after 12<sup>th</sup> grade) and low English proficiency, as indicated by raw scores on the *TOAL-3* (3-8,  $M=7$ ,  $SD=2.73$ ) (henceforth, the late/low group). The L2 proficiency scores were obtained to ensure that the two groups clearly differed in their proficiency scores and there was no overlap. All participants reported a history of normal speech, language, and neurological development, and

passed a hearing screening at 20 dB at .5 kHz, 1 kHz, 2 kHz, 4 kHz and 6 kHz using pure tone audiometry.

The two groups were comparable in their academic qualifications (i.e., all were college graduates) and L1 experience. All were born and brought up in Kolkata, India, where Bengali is the official state language. The parents of all the participants were native speakers of Bengali. All participants were exposed to English at the same age in their school (i.e., from the kindergarten level). However, the two groups differed in their nature of English exposure in school. The early/high group had simultaneous exposure to Bengali and English from the kindergarten level as the content language in school for the early/high group was English; the language of instruction was English. For the late/low group until grade 12, Bengali was the content language or the language of instruction in school; the English language was only a course/subject that focused on grammar and prose. For the late/low group, the content language in academia became English only when they started at their undergraduate institution. Then the two groups arrived in the United States of America (USA) for their graduate studies. The early/high and the late/low groups were comparable in their initial age of arrival in the USA; they all arrived in the USA as graduate students from India. Their years of exposure to English in the USA were similar (Refer to Table 1).

**Table 1: Participant Demographic Information.**

<b>Groups</b>	<b>Early/High</b>	<b>Late/Low</b>
<b>Academic Qualifications</b>	Graduate Students	Graduate Students
<b>L1 Experience</b>	Bengali Since Birth	Bengali Since Birth
<b>Parents</b>	Native Bengali Speakers	Native Bengali Speakers
<b>Initial Age of Arrival in the U. S.</b>	20 to 25 Years	20 to 25 Years
<b>Language of Instruction at School</b>	English	Bengali

In a case history form, all participants chose Bengali as their most proficient language. Bengali proficiency was not formally measured. The use of a monolingual English-speaking control group was excluded because of

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their inherent difference in language processing mechanisms and potential confounds with socioeconomic status, education, and life-experience. The research reported in this manuscript adheres to basic ethical considerations regarding the protection of human participants in research and has been approved by Texas State University's Committee on the Use of Human Research Subjects. Written consent was obtained where participants were told that their identity would remain anonymous and that they could withdraw at any time during the experiment.

## **Stimuli and Procedure**

The participants described three separate picture cards in English, their L2. All pictures were drawn from the *Boston Diagnostic Aphasia Examination* (Goodglass, Kaplan & Barresi, 2001). The first was the "Cookie Theft" picture, depicting a scene from Western civilization in regard to the people pictured, the setting, and the actions in the picture. The second and third pictures were sequenced drawings of fables, often attributed to Aesop (Pinkney, 2000) that are common to both English and Bengali. The second picture is based on Aesop's fable (Pinkney, 2000) of the lion and the mouse, and shows a lion, who, after catching a mouse, decides to release him. In gratitude, the mouse reciprocates with an equitable life-saving gesture towards the lion. The third picture depicts Aesop's fable (Pinkney, 2000) of the fox and the crow, where the crow loses a piece of food when a fox tempts the crow to open its mouth and sing.

The participants were presented one picture card at a time. To ensure that the gradation of non-nativity in the pictures remained consistent across the participants, the pictures were presented in a fixed order of Cookie Theft (most foreign) first, the Lion and the Rat (fewer elements of non-nativity existed) second, and the Fox and the Crow (common across both L1 and L2 cultures) third. The participants were asked to describe the pictures by telling a story (i.e., "I am going to ask you to describe three pictures. Look at each picture. Spend as much time as you want. Describe what you see in the picture."). No time limits were given. The audio samples were recorded using PRAAT acoustic software (Boersma & Weenink, 2009).

## **Measures**

Two graduate students used broad transcription to transcribe the audio samples. The graduate students had successfully completed coursework in phonetic

transcription and language sample analysis prior to this project. There were 51 transcripts (17 participants x 3 pictures/sequences each). Two experimenters analyzed productions using PRAAT acoustic software. Along with the total number of mazes, productions were coded into three separate categories: time-dependent measures (i.e., empty pauses and filled pauses); measures for repetitions (sound repetition, part-word repetition, whole-word repetition, phrase repetition); and measures for revisions (phrase revisions, lexical revisions, grammatical revisions); connectors (repetitive use of conjunctions or time markers at the beginning of utterances).

The types of mazes coded were: empty pause, filled pause (e.g., Um\* she's washing dishes), sound repetition (e.g., The [w\*] window is open), part-word repetition (e.g., The [pl\*] plates are in the sink), whole-word repetition (e.g., The [plates\*] plates are in the sink); phrase repetition (e.g., [The plates are\*] the plates are in the sink), phrase revisions (e.g., The [blates\*] plates are in the sink), lexical revisions (e.g., The [sister\*] mother is washing the dishes, mother → sister), and grammatical revisions (e.g., [She\*] The mother is washing the dishes) and connectors (see Table 2).

**Table 2: Examples of the Types of Mazes.**

<b>Maze type</b>	<b>Example</b>
Empty pause	2+ seconds of silence
Filled pause	(Um) she's washing dishes.
Sound repetition	The (w) window is open.
Part-word repetition	The (pl) plates are in the sink.
Whole-word repetition	The (plates) plates are in the sink.
Phrase repetition	(The plates are) the plates are in the sink.
Phrase revision	The (blates) plates are in the sink.
Lexical revision	The (sister) mother is washing the dishes.
Grammatical revision	(She) the mother is washing the dishes.

The experimenters coded the total number of mazes and the frequency of individual maze types. Due to the expected variations observed in the duration of description and the number of morphemes used, frequency of each maze-type was converted into a percentage score. It should be mentioned that the word count included words in mazes but did not include filled pauses. These percentages were submitted for statistical analyses. Inter-rater reliability was calculated on approximately 20% of the dataset; for frequency of

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mazes, it was 98.5% and for type of maze, it was 94.2%, averaged across all categories.

## Statistical Analyses

Several repeated measures ANOVAs were performed. The two bilingual groups were compared for the total number of mazes used, the percentage of use of time-dependent mazes (duration of pauses), and the percentage measures based on frequency for repetitions and revisions. The between-group factors were bilingual group status (early/high vs. late/low). The within-group variables were types and percentages of mazes. The statistical significance level was set at .05.

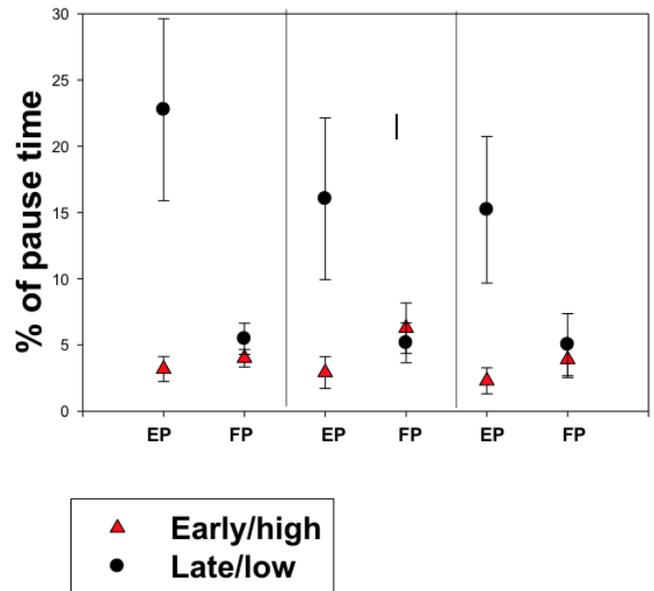
## RESULTS

Analyses of the data revealed that the two bilingual groups did not differ in their total number of mazes,  $F(1,15) = 0.02, p = .87, h_p^2 = .001$ . The early/high group produced a similar number of mazes to the late/low group. There was no group-by-picture interaction observed,  $F(2, 30) = 2.84, p = .07, h_p^2 = 0.16$ ; across the three pictures, the two groups produced similar number of mazes.

The two groups differed in their use of time-dependent mazes (i.e., empty and filled pauses),  $F(1, 15) = 4.67, p = .04, h_p^2 = .24$ . The early/high group used a significantly smaller percentage of pause time than did the late/low group. A group by pause-type interaction was observed,  $F(1, 15) = 4.97, p = .04, h_p^2 = .24$ . Post-hoc testing (Tukey HSD) revealed that the early/high group used a lower percentage of empty pauses than the percentage of empty pauses used by the late/low group; the two groups did not differ in the percentage of filled pause use. The early/high group used similar percentages of empty and filled pauses and so did the late/low group. When repetitions and revisions were analyzed, the early/high and the late/low groups did not differ in their percentage of repetition use,  $F(1, 15) = 1.4, p = .25, h_p^2 = .08$ . Similarly, the two groups were not different in their percentage of revisions,  $F(1, 15) = 0.02, p = .88, h_p^2 = .001$ . In summary, the two proficiency groups did not differ in their total number of mazes. However, they differed in their use of empty pauses. The nature of the picture stimuli did not influence variations across the two groups (refer to Figures 1 & 2).

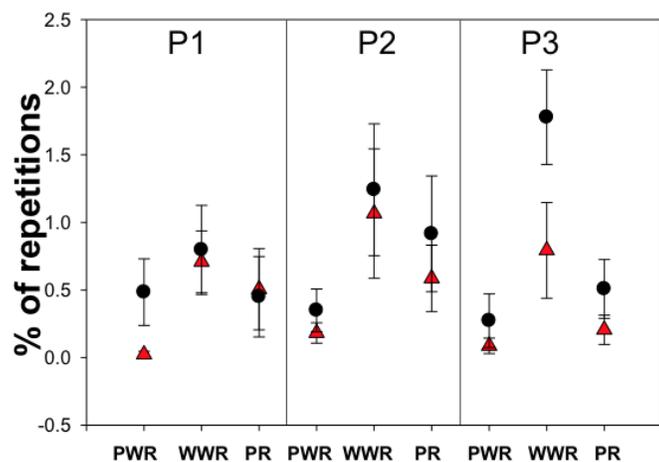
**Figure 1. Percentage of pause time used by the early/high (filled triangle) and late/low (filled circle) for three pictures; left panel P1 – cookie theft, middle panel P2 –the Lion and the Rat; right panel P3 - the**

**Fox and the Crow. Error bars represent standard errors. EP – empty pause, FP – filled pause.**



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**Figure 2.** Percentage of repetition used by the early/high (filled triangle) and late/low (filled circle) for three pictures; left panel P1 – cookie theft, middle panel P2 –the Lion and the Rat; right panel P3 - the Fox and the Crow. PWR – part word repetition, WWR – whole word repetition, PR - phrase repetition. Error bars represent standard errors.



## DISCUSSION

The two proficiency groups were similar in their mazing behaviors, except in their use of empty pauses. While some research reports have suggested that proficient speakers of a target language use fewer mazes (Bedore et al., 2006; Gleitman, et al., 1972; McKee, Rispoli, McDaniel, & Garrett, 2006; Navarro-Ruiz & Rallo-Fabra, 2001), others have not noted significant differences between proficient and less-proficient speakers (Bedore et al., 2006; Collier, 1989; Hakuta, Goto Butler, & Witt, 2000; Jacobsen & Schwartz, 2005; Nippold, 2007). Nippold (2007) noted that mature speakers sometimes produced excessive mazes in their L1, despite having advanced language skills. This finding of “more fluent, less hesitation” is quite prevalent in the research (Clark & Fox-Tree, 2002; Hilton, 2009, Rispoli, 2003).

Historically, the production of pauses has been used as a window to understand speakers’ planning mechanism and is also considered an overt marker of a potential overload of the production system (Goldman-Eisler, 1968, 1972). However, it should also be noted that speakers do not pause every time they plan their productions and all pauses cannot be a result of an underlying language planning mechanism (Garman, 1990). A linear interpretation is discouraged since pauses could be a bio-

physical operation to allow influx of air into the respiratory subsystem; they could be a psycho-cognitive device that speakers use to plan their speech or could even be an example of speech-acts serving a communicative function to help listeners identify boundaries in the outgoing chain of syllables. Hence, the difference in the use of empty pauses observed in this study could suggest any of the aforementioned possibilities.

In the field of psycholinguistics, researchers have mainly explored the cognitive functions of pauses and reported that pauses indicate time-outs while speakers search for the next linguistic element or for the next relevant idea (Christenfeld, Schacter & Bilous, 1991; Goldman-Eisler, 1968, 1972; Rochester, 1973). Presence of pauses has been associated with the difficulty of the task-in-hand or the complexity of the content (Schachter, Christenfeld, Ravina & Bilous, 1991). Overall, temporal mazes, such as pauses, are considered symptoms of difficulties encountered in processing and planning (Kenny, 1996). The late/low speakers of the current study might have used more empty pauses due to the potential processing load imposed on them due to the task-demand, while accessing specific and relevant permissible linguistic constructs and satisfying the semantic relevance requirement.

The results of the current study also suggested that the empty and the filled pauses could be selectively influenced by age of academic L2 exposure or proficiency. The underlying mechanisms are potentially different for empty and filled pauses. For example, Cenoz (1998) examined silent and filled pauses that were hesitation pauses and excluded the ones occurring at grammatical junctures. She reported that two-thirds of the observed pauses were silent and the remainder were filled pauses. Different underlying processing for different types of pauses was also supported, as Cenoz (1998) found a wide variation in the use of filled pauses, and fewer variations in the use of silent or empty pauses. Thus, consistent with the existing literature of age of initial exposure to an L2 (indexed by academic exposure) and its influence on various aspects of language production, age-related influence is also observed in nonlinguistic aspects, such as mazes.

Even though both types of pauses tend to occur in the same positions within sentences (Garman, 1990), from a functional perspective, empty and filled pauses reflect different underlying mechanisms. Empty pauses reflect

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the cognitive difficulty associated with the target task, while filled pauses reflect affective states, such as anxiety (Goldman-Eisler, 1968).

The higher frequency of empty pauses observed in the productions of the late/low group might suggest cognitive difficulty, potentially associated with the four stages of speech: planning, conceptualizing a message, formulating the appropriate linguistic forms, and articulating them (Levelt, 1989; Bates & McWhinney, 1987). These stages un simultaneously and prevalence of empty pauses could potentially mark a disruption in any or all of the stages (Clark & Fox-Tree, 2002).

In future studies, it would be interesting to examine the constituents before and after the empty pauses to determine whether specific locations of pause correlate with L1 and L2 proficiency, since time-dependent disfluencies such as pauses are more frequent at the beginning of the constituents than in other positions (Clark & Wasow, 1998; Shriberg, 1994). Studies using event related potentials (ERP) could explore the underlying neurolinguistic processes in production of pauses between utterances and within utterances. We also need to explore language-specific maze use to see if mazing behaviors are due to bilingual status or due to characteristics of the spoken languages (Bedore, et al., 2006).

## **Conclusion**

The objective of this research was to examine influence of age of academic L2 exposure and proficiency on maze productions of bilingual adults coming to a native English-speaking country as students from a post-colonial country. In the initial question, we asked if the overall frequency of mazes is influenced by age of L2 exposure and L2 proficiency of the bilinguals. Our results suggested that age of academic L2 exposure and proficiency did not induce a discernable influence on the overall frequency of maze productions in the two groups of bilinguals. However, the second issue we investigated pertained to the relative distribution of different mazing behaviors and there we observed that, only for the production of empty pauses, the two proficiency groups differed; the early L2 exposed and high L2 proficiency group used a relatively smaller number of empty pauses. As a third outcome, we did not find that any specific picture stimulus was more sensitive than others to capture the proficiency difference between the two groups. Overall, the types of mazing behavior appeared far more

complex and reticulated than what we originally assumed. Clearly, the maze-proficiency relationship needs further exploration, as variable findings across studies are reported.

Thus, the results of this study should be interpreted with specific reference to the participants, the tasks, and to the method of analyses. Future studies should include more participants from India with varying L1 backgrounds but English as their L2, thus, minimizing the possibility of Type I and Type II errors. Adding expository samples, delayed imitation tasks, and tasks demanding even more complex linguistic processing might reveal a broader picture of the underlying linguistic mechanisms. Including two monolingual control groups, one for English and the other for Bengali, might offer us better reference platforms. With the increasing number of world Englishes (Schneider, 2014), it is critical to understand how different dialects of English interact with the local L1 in bilingual speakers.

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## **Declaration of Conflicting Interests**

The Author(s) declare(s) that there is no conflict of interest.

## **REFERENCES**

- Albrechtsen, D., Henriksen, B., & Faerch, C. (1980). Native speaker reactions to learners' spoken interlanguage. *Language Learning* 30, 365-396. doi: 10.1111/j.1467-1770.1980.tb00324.x.
- Bates, E. and MacWhinney, B. (1987) Competition, variation, and language learning. In B. MacWhinney (ed.) *Mechanisms of Language Acquisition* (pp. 157-193). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bedore, L. M., Fiestas, C. E., Pena, E. D., & Nagy, V. J. (2006). Cross-language comparisons of maze use in Spanish and English in functionally monolingual children. *Bilingualism: Language and Cognition*, 9 (3), 233-247. doi:[dx.doi.org/10.1017/S1366728906002604](https://doi.org/10.1017/S1366728906002604).

# *Journal of the National Black Association for Speech-Language and Hearing*

- Bialystok, E. (2001). Metalinguistic aspects of bilingual processing. *Annual Review of Applied Linguistics*, 21, 169-181. doi:10.1016/S0378-2166(01)00060-1.
- Bialystok, E., & Hakuta, K. (1999). Confounded age: Linguistic and cognitive factors in age differences for second language acquisition. *Second language acquisition and the critical period hypothesis*, 161-181.
- Bialystok, E., Luk, G., Peets, K. F., & Yang, S. (2010). Receptive vocabulary differences in monolingual and bilingual children. *Bilingualism: Language and Cognition*, 13(04), 525-531. doi:10-1017/S1366728909990423.
- Birdsong, D. (1992). Ultimate attainment in second language acquisition. *Language*, 68(4), 706-755. doi: 10.2307/416851.
- Birdsong, D., & Molis, M. (2001). On the evidence for maturational constraints in second-language acquisition. *Journal of Memory and language*, 44(2), 235-249. doi:org/10.1006/jmla2000.2750.
- Boersma, P., & Weenink, D. (2009). *Praat: Doing phonetics by computer* (Version 5.1. 05) [Computer program]. Retrieved from [https://praat.secursoft.net/?network=ContentSearch&utm\\_source=bing&utm\\_medium=cpc&utm\\_campaign=US%3A%20Audio&utm\\_term=Download%20Praat&utm\\_content=praat](https://praat.secursoft.net/?network=ContentSearch&utm_source=bing&utm_medium=cpc&utm_campaign=US%3A%20Audio&utm_term=Download%20Praat&utm_content=praat).
- Bosker, H. R. (2014). Research note: The processing and evaluation of fluency in native and non-native speech.
- Cenoz, J. (1998). *Pauses and communication strategies in second language speech*. ERIC Document ED 426630. Rockville, MD: Educational Resources Information Center.
- Christenfeld, N., Schachter, S., & Bilous, F. (1991). Filled pauses and gestures: It's not coincidence. *Journal of Psycholinguistic Research*, 20(1), 1-10. doi:0090-6905/91/0100-001\$06.50/0.
- Clark, H. H., & Wasow, T. (1998). Repeating words in spontaneous speech. *Cognitive Psychology*, 37(3), 201-242. doi:10.1006/cogp.1998.0693.
- Clark, H. H., & Fox Tree, J. E. (2002). Using uh and um in spontaneous speaking. *Cognition*, 84(1), 73-111. doi:10.1016/S0010-0277(02)00017-3.
- Collier, V. P. (1989). How long? A synthesis of research on academic achievement in a second language. *TESOL quarterly*, 23(3), 509-531. doi:10.2307/3586923.
- Corley, M., MacGregor, L. J., & Donaldson, D. I. (2007). It's the way that you, er, say it: Hesitations in speech affect language comprehension. *Cognition*, 105(3), 658-668. doi:org/10.1016/j.cognition.2006.10.010.
- Cruttenden, A. (1986). *Intonation*. Cambridge, England: Cambridge University Press.
- Eckert, P. (1990). Cooperative competition in adolescent "girl talk". *Discourse Processes*, 13, 91-122. doi:10.1080/01638539009544748.
- Edmunds, P. (2006). Buen---Buena Gente: Repair in the Spanish of the southwest. Selected proceedings of *The 8<sup>th</sup> Hispanic Linguistics Symposium*, ed. Timothy L. Face and Carol A. Klee, 204-213. Somerville, MA: Cascadilla Proceedings Project.
- Fehringer, C., & Fry, C. (2007). Hesitation phenomena in the language production of bilingual speakers: The role of working memory. *Folia Linguistica*, 41(1-2), 37-72. doi:10.1515/flin.41.1-2.37.
- Flege, J. E., Yeni-Komshian, G. H., & Liu, S. (1999). Age constraints on second-language acquisition. *Journal of memory and language*, 41(1), 78-104. doi: [org/10.1006/jmla.1999.2638](http://org/10.1006/jmla.1999.2638).
- Fletcher, P. (1990). Sub-groups of school-age language impaired children. *Child Language Teachings and Therapy*, 6(1), 47-58. doi:10.1177/026565909000600106.
- Fox-Tree, J. E. F. (1995). The effects of false starts and repetitions on the processing of subsequent words in spontaneous speech. *Journal of memory and language*, 34(6), 709-738. doi:10.1006/jmla.1995.1032.
- Fromkin, V. (1980). *Errors in linguistic performance: Slips of the tongue, ear, pen, and hand*. Boston, MA: Academic Press.
- Fromkin, V. (1973). *Slips of the tongue*. (pp 181-187). WH Freeman.

# *Journal of the National Black Association for Speech-Language and Hearing*

- Garman, M. (1990). *Psycholinguistics*. Cambridge textbooks in linguistics. 24: 267-288. doi:[dx.doi.org/10.1017/S0142716403000158](https://doi.org/10.1017/S0142716403000158).
- Gleitman, L. R., Gleitman, H. & Shipley, E. F. (1972). The emergence of the child as grammarian. *Cognition*, 1 (2/3), 137-164. doi:[10.1016/0010-0277\(72\)90016-9](https://doi.org/10.1016/0010-0277(72)90016-9).
- Goldman-Eisler, F. (1972). Segmentation of input in simultaneous translation. *Journal of Psycholinguistic Research*, 1(2), 127-140.
- Goldman-Eisler, F. (1968). *Psycholinguistics: Experiments in spontaneous speech*. Boston, MA: Academic Press.
- Gollan, T. H., & Acenas, L. A. R. (2004). What is a TOT? Cognate and translation effects on tip-of-the-tongue states in Spanish-English and Tagalog-English bilinguals. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 30(1), 246. doi: 10.1037/0278-7393.30.1.246.
- Gollan, T. H., Montoya, R. I., & Bonanni, M. P. (2005). Proper names get stuck on bilingual and monolingual speakers' tip of the tongue equally often. *Neuropsychology*, 19(3), 278. doi: 10.1037/0894-4105.19.3.278.
- Gollan, T. H., Montoya, R. I., Cera, C., & Sandoval, T. C. (2008). More use almost always means a smaller frequency effect: Aging, bilingualism, and the weaker links hypothesis. *Journal of Memory and Language*, 58(3), 787-814. doi:10.1016/j.jml.2007.07.001.
- Gollan, T. H., Montoya, R. I., & Werner, G. A. (2002). Semantic and letter fluency in Spanish-English bilinguals. *Neuropsychology*, 16(4), 562. doi:10.1037/0894-4105.16.4.562.
- Gollan, T. H., & Silverberg, N. B. (2001). Tip-of-the-tongue states in Hebrew-English bilinguals. *Bilingualism: Language and Cognition*, 4(01), 63-83. doi: 10.1017/S136672890100013X.
- Goodglass, H., Kaplan, E., & Barresi, B. (2001). *BDAE: The Boston Diagnostic Aphasia Examination*. Philadelphia, PA: Lippincott Williams and Wilkins.
- Gutiérrez-Clellen, V. F. & Kreiter, J. (2003). Understanding child bilingual acquisition using parent and teacher reports. *Applied Psycholinguistics* 24: 267-288. doi:[dx.doi.org/10.1017/S0142716403000158](https://doi.org/10.1017/S0142716403000158).
- Hakuta, K., Goto Butler, Y. & Witt, D. (2000). *How long does it take English learners to attain proficiency?* Santa Barbara, CA: University of California Linguistic Minority Research Institute Policy Report.
- Hammill, D. D., Brown, V. L., Larsen, S. C., & Wiederholt, J. L. (1994). Test of adolescent and adult language. Austin, Texas: Pro-Ed.
- Han, Z & Odlin, T. (2004). *Fossilization in adult second language acquisition*. Toronto: Multilingual Matters.
- Hilton, H. E. (2009). Annotation and analyses of temporal aspects of spoken fluency. *CALICO Journal* 26, 644-661.
- Hopper, J. (2014). Learning two languages: Maze behaviors in narrative discourse for Spanish-English bilinguals. *All Graduate Plan B and other Reports, Paper 440*. Downloaded from <http://digitalcommons.usu.edu/gradreports/440>.
- Ivanova, I., & Costa, A. (2008). Does bilingualism hamper lexical access in speech production? *Acta Psychologica*, 127(2), 277-288. DOI: 10.1016/j.actpsy.2007.06.003
- Jacobson, P. F., & Schwartz, R. G. (2005). English past tense use in bilingual children with language impairment. *American Journal of Speech-Language Pathology*, 14(4), 313-323. doi:1058-0360/05/1404-0313.
- Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive psychology*, 21(1), 60-99. doi:[org/10.1016/0010-0285\(89\)90003-0](https://doi.org/10.1016/0010-0285(89)90003-0).
- Kenny, D. A. (1996). Models of non-independence in dyadic research. *Journal of Social and Personal Relationships*, 13(2), 279-294. doi:10.1177/0265407596132007.
- Kowal, S., Bassett, M. R., & O'Connell, D. C. (1985). The spontaneity of media interviews. *Journal of psycholinguistic research*, 14(1), 1-18. doi:0090-6905/85/0100-0001\$04.50/0.

# *Journal of the National Black Association for Speech-Language and Hearing*

- Leadholm, B.J. & Miller, J. (1995). *Language sample analysis: The Wisconsin Guide*. Madison, WI: Wisconsin Department of Public Health.
- Lennon, P. (1990). Investigating fluency in EFL: A quantitative approach\*. *Language learning*, 40(3), 387-417. doi:10.1111/j.1467-1770.1990.tb00669x.
- Levelt, W. J. (1999). Models of word production. *Trends in Cognitive Sciences*, 3(6), 223-232. doi:10.1016/S1364-6613(99)01319-4.
- Levelt, W.J.M. (1989). *Speaking: From intention to articulation*. Cambridge, MA: MIT Press.
- Levelt, W. J., & Cutler, A. (1983). Prosodic marking in speech repair. *Journal of semantics*, 2(2), 205-218. doi:10.1093/semant/2.2.205.
- Lickley, R. J., & Bard, E. G. (1996, October). On not recognizing disfluencies in dialogue. In *Spoken Language, 1996. ICSLP 96. Proceedings., Fourth International Conference on* (Vol. 3, pp. 1876-1879). IEEE. doi:10.1109/ICSLP.1996.607998.
- Loban, W. (1976). *Language development: Kindergarten through grade twelve*. Urbana, IL: National Council of Teachers of English.
- Loban, W. (1963). *The language of elementary school children*. Champaign, IL: National Council of Teachers of English.
- Long, M. H. (1990). Maturation constraints on language development. *Studies in second language acquisition*, 12(03), 251-285. doi:org/10.1017/S0272263100009165.
- McKee, C., Rispoli, M., McDaniel, D., & Garrett, M. (2006). How do children become adult sentence producers?. *Applied Psycholinguistics*, 27(01), 74-81. doi: [org/10.1017/S0142716406060139](https://doi.org/10.1017/S0142716406060139).
- Michael, E., & Gollan, T. H. (2005). *Handbook of bilingualism: Psycholinguistic approaches*. Oxford, England: Oxford University Press.
- Muñoz, C. & Singleton, D. (2011) A critical review of age-related research on L2 ultimate attainment. *Language Teaching*, 44(1), 1-35. doi:org/10.1017/S0261444810000327
- Nakajima, S., & Allen, J. F. (1993). A study on prosody and discourse structure in cooperative dialogues. *Phonetica*, 50(3), 197-210. doi:10.1159/000261940.
- Navarro-Ruiz, M. I., & Rallo-Fabra, L. (2001). Characteristics of mazes produced by SLI children. *Clinical linguistics & phonetics*, 15(1-2), 63-66. doi: 10.3109/02699200109167632.
- Nettelbladt, U. & Hansson, K. (1999) Mazes in Swedish pre-school children with specific language impairment. *Clinical Linguistics and Phonetics*, 13, 483-497. doi: 10.1080/026992099298997
- Nippold, M. (2007). *Later language development: School-age children, adolescents, and young adults—3<sup>rd</sup> Edition*. Austin, Texas: Pro-Ed Inc.
- Nippold, M. A. (1993). Developmental markers in adolescent language syntax, semantics, and pragmatics. *Language, Speech, and Hearing Services in Schools*, 24(1), 21-28. doi: 10.1044/S0161-14612401.21.
- Nooteboom, S. G. (1973). The perceptual reality of some prosodic durations. *Journal of Phonetics*, 1(1), 25-45.
- Pickering, L. (1999). *An analysis of prosodic systems in the classroom discourse of native speaker and nonnative speaker teaching assistants*. Unpublished doctoral dissertation, Gainesville, University of Florida.
- Pinker, S. (1994). How could a child use verb syntax to learn verb semantics?. *Lingua*, 92, 377-410. doi:10.1016/0024-3841(94)90347-6.
- Pinkney, J. (2000). *Aesop's fables*. Chronicle Books.
- Postma, A., Kolk, H., & Povel, D. J. (1990). On the relation among speech errors, disfluencies, and self-repairs. *Language and Speech*, 33(1), 19-29. doi:10.1177/00238309900330010.
- Poulisse, N. (1999). *Slips of the tongue: Speech errors in first and second language production* (Vol. 20). Amsterdam, Netherlands: John Benjamins Publishing.
- Olynyk, M., D'Anglejan, A., Sankoff, D. (1987). A quantitative and qualitative analysis of speech markers in the native and second language speech of bilinguals. *Applied Psycholinguistics* 8, 121-136. doi:dx.doi.org/10.1017/S0142716400000163.

# *Journal of the National Black Association for Speech-Language and Hearing*

- Reed, M. (2000). He Who Hesitates: Hesitation Phenomena as Quality Control in Speech Production, Obstacles in Non-Native Speech Perception. *The Journal of Education*, 182(3), 67-91. Retrieved from <http://www.jstor.org/stable/42744077>.
- Rieger, C. L. (2003). Repetitions as self-repair strategies in English and German conversations. *Journal of Pragmatics*, 35(1), 47-69. doi:10.1016/S0378-2166(01)00060-1.
- Rispoli, M. (2003). Changes in the nature of sentence production during the period of grammatical development. *Journal of Speech, Language, and Hearing Research*, 46, 818-830.
- Rochester, S. R. (1973). The significance of pauses in spontaneous speech. *Journal of Psycholinguistic Research*, 2(1), 51-81. doi:10.1007/BF01067111.
- Sandoval, T. C., Gollan, T. H., Ferreira, V. S., & Salmon, D. P. (2010). What causes the bilingual disadvantage in verbal fluency? The dual-task analogy. *Bilingualism: Language and Cognition*, 13(02), 231-252. doi:10.1017/S1366728909990514.
- Schachter, S., Christenfeld, N., Ravina, B., & Bilous, F. (1991). Speech disfluency and the structure of knowledge. *Journal of Personality and Social Psychology*, 60(3), 362. doi: 10.1037/0022-3514.60.3.362.
- Schneider, E. W. (2014). New reflections on the evolutionary dynamics of world Englishes. *World Englishes*, 33(1), 9-32. DOI: 10.1111/weng.12069.
- Shriberg, E. E. (1994). *Preliminaries to a theory of speech disfluencies* (Doctoral dissertation, University of California at Berkeley).
- Shriberg, E., & Stolcke, A. (1996, October). Word predictability after hesitations: a corpus-based study. In *Spoken Language, 1996. ICSLP 96. Proceedings., Fourth International Conference on* (Vol. 3, pp. 1868-1871). IEEE. doi:10.1109/ICSLP.1996.607996.
- Silva-Corvalán, C. (1994). *Language Contact and Change: Spanish in Los Angeles*. New York, NY: Oxford University Press
- Singleton, D. (1989). *Language acquisition: The age factor*. Cleverdon, Avon: Multilingual Matters.
- Swerts, M. (1998). Filled pauses as markers of discourse structure. *Journal of Pragmatics* 30, 485-496. doi: 0378-2166/98/\$19.00.
- Swerts, M., & Geluykens, R. (1994). Prosody as a marker of information flow in spoken discourse. *Language and speech*, 37(1), 21-43. doi:10.1177/002383099403700102.
- Wiese, R. (1984). Prosodic conditions on clitics. *Phonologica*, 331-338.