1. Project Description

Speech-language pathologists (SLPs) rely on formal (i.e., standardized, criterion-based testing) as well as informal (i.e., observations, SLP clinical judgement, non-standardized) assessment measures. These measures are used for descriptive information critical to evaluating a child’s need for intervention. Although the general assumption is that informal measures are reliable, the reality may be much different.

This proposal is to request funding for a project in which I will collect and examine data regarding the test-retest reliability of informal speech sound measures for typically developing 2-year-old children. Test-retest reliability is the degree to which an analysis is stable over time. The project will be an extension of the work conducted by Morris (2009). When evaluating the speech samples of typically developing 18- to 22-month old children, Morris found that the test-retest reliability of analyses conducted on two different speech samples collected from the same child one week apart was unstable and did not represent the same number or range of speech sounds produced. I will be extending the findings of this research by conducting a similar study including children who are two- to eight-months older than the sample used in the Morris study to determine if the findings remain consistent across an additional age range.

This research is critical to the field of speech-language pathology because SLPs need to have viable information on the effectiveness of the client speech samples as well as the measures used to analyze the data. The length and type of the sample and measures used for analysis are all crucial pieces used to determine the reliability of a speech sample. This research is an important step towards a more reliable and accurate way to assess speech and language skills through informal means (e.g., collection of conversational speech samples).

Background

Preston, Ramsdell, Oller, Edwards, and Tobin (2011) suggested using a weighted measure for speech sound accuracy and referenced the Morris (2009) study as a reason for doing so. Other research supported the use of relational measures (i.e., comparing the child’s utterance to the adult form of the word) because the test-retest reliability was strong (Heilmann, DeBrock, Riley-Tillman, 2013). Heilmann et. al (2013) collected language samples from children in the form of a structured interview and measured speech sound accuracy using relational measures. The study findings indicated the test-retest reliability was very strong in this case.

Activities/Methodology

Participants will include three typically-developing children between the ages of 24- to 36-months of age. Participants will be recruited from educational (e.g., daycare, preschool centers) and clinical (e.g., doctors’ offices) agencies in the Omaha-metro area. All data collection will be conducted in the University of Nebraska - Omaha Speech-Language-Hearing Clinic located in 512 Roskens Hall.

Two screening measures will be used to determine whether a potential participant is a typically developing 2-year-old: the MacArthur Bates Communicative Development Inventory: Words and Sentences (CDI) (a parent checklist of a child’s expressive vocabulary), and the Preschool Language Scale-5th edition (PLS-5) (a standard measure for early language development). Scores at or above the 35th percentile on the MacArthur-Bates CDI and a total language standard score of 85 or higher on the PLS-5 will be used as a baseline in determining children to be typically developing. After the screening measures are completed, two 20-minute conversational speech samples will be collected from each child one week apart. The language
samples will be collected during a play session between the child and the child’s parent or caregiver. The sessions will be video recorded for later viewing by the researcher. After the data collection, each participant’s utterances will be transcribed using the International Phonetic Alphabet (IPA) and analyzed using two separate informal speech sound analyses; phonetic inventory and word shape. A phonetic inventory is a measurement of all the different sounds a child uses even if the sound is not produced in the appropriate word position. For example, if a child says “tæt” for “cat,” /t/ in initial word position is recorded in the inventory. A word shape analysis is a measurement of complexity for the types of sounds a child combines together into words. For example, words with only a consonant and vowel (CV shape) are less complex than words with a consonant, a vowel, and then another consonant (CVC shape).

The informal speech sound analyses will be conducted for each 20-minute speech sample. Results will be compared between each child’s first and second sample. Results will be displayed via a poster presentation depicting descriptive statistics of the participants.

**Project Timeline**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Month</th>
<th>Task</th>
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<tbody>
<tr>
<td>Spring/Summer 2014</td>
<td>March to May</td>
<td>Order materials, recruit participants, begin data collection</td>
</tr>
<tr>
<td>Summer 2014</td>
<td>May to August</td>
<td>Continue data collection, start video transcriptions, begin data analysis</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>August to December</td>
<td>Continue video transcriptions and data analysis</td>
</tr>
<tr>
<td>Spring 2015</td>
<td>January to March</td>
<td>Plot visual analysis displays for student poster presentation at Student Research Fair; manuscript preparation for undergraduate research journal submission</td>
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**Student/Faculty Mentor Roles**

I will be collecting all the necessary data with Dr. DeVeney closely supervising. After data collection, I will be conducting all transcription and analyses, and Dr. DeVeney will transcribe 20% of the data to ensure reliability. Dr. DeVeney will be available for guidance and advice.
2. Budget Justification

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Preschool Language Scale - 5 (PLS-5) total test kit</td>
<td>$349.00</td>
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<tr>
<td>Protocols for MacArthur Bates Communicative Development Inventory (pack of 25 protocols)</td>
<td>$25.00</td>
</tr>
<tr>
<td>Participant Stipend ($20/participant X 6 potential participants)</td>
<td>$120.00</td>
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<tr>
<td>Student Stipend</td>
<td>$2,000.00</td>
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**Total:** $2,494.00

I am asking for $349.00 to purchase a testing kit of the Preschool Language Scale - 5 (PLS-5) so I will be able to conveniently access this test while conducting my research, rather than competing with other undergraduate and graduate students checking the test out from the speech-language clinic. This way, I will be able to easily schedule experimental sessions with participants without having to schedule around other students’ use of this assessment tool.

$25.00 for a packet of MacArthur Bates Communicative Development Inventory protocols is necessary for this project because the participants will be tested using this standardized measure. Having this vocabulary checklist for each participant is crucial for my data collection.

By paying my participants $20 each, I would be able to compensate for their time spent participating in the study.

The student stipend of $2,000 will help cover costs of basic living while I devote myself to this project. I plan to spend a minimum of 200 hours on this project and the stipend will allow me to allocate ample time to the project without having to schedule around an off-campus job.
3. References


October 7, 2013

Dear FUSE Grant Selection Committee:

It is a pleasure to support Katherine (Katie) Wittler’s FUSE Grant application. I first got to know Katie when she attended my spring 2013 course “Articulation and Phonological Disorders” in which she earned an “A.” I have also had a great deal of experience with Katie when she worked as a research assistant for a UCRCA-sponsored project I lead in Spring-Summer 2013. She is a dedicated student and also promising researcher. As her faculty mentor, I fully support her endeavor to secure FUSE Grant funding for an undergraduate research project, “Test-Retest Reliability of Independent Phonological Measures of 2-year-old Speech.”

Katie initiated the present project and completion of the project relies heavily on the content knowledge Katie acquired during the Articulation and Phonology Disorders course last spring. Katie has completed the necessary CITI Training last spring and has committed many hours already to the current project since mid-August. As the primary investigator on the present project, she is in the process of applying for an IRB. My role as her faculty mentor is to be available for regular meetings, supervise the data collection, and help her trouble-shoot potential problems. After the data is collected, I will transcribe 20% of the child data to ensure Katie’s transcription reliability and provide guidance in the dissemination of her findings.

In summary, Katie has demonstrated dedication and enthusiasm for research as an undergraduate student and I fully support her FUSE Grant application. She is definitely capable of leading the present project.

Sincerely,

Shari L. DeVeney, Ph.D., CCC-SLP
Assistant Professor
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