

## Does Choral Singing Improve Word Finding? A single-subject examination of the effects of choir participation: Final Narrative Report

Current literature points to evidence that music can be beneficial when incorporated into speech-language therapy for individuals with aphasia, a disorder that inhibits an individual's access to language and causes impairments in the expression and comprehension of language in spoken and written modalities (Brady, Kelly Godwin, & Enderby, 2012; Corsten, Konradi, Schimpf, Hardering & Keilmann, 2014). Since aphasia is caused by focal damage to the left side of the brain, speculation on the positive effects of music on this particular disorder stems from the fact that music promotes global activation of the brain (Schlaug, Marchina, & Norton, 2009). Moreover, multiple studies have shown that individuals with aphasia appear to have preserved vocal music capabilities (Fogg-Rogers et al., 2015; van Der Meulen, van de Sandt-Koenderman, & Ribbers, 2012). Because music makes use of spared abilities in individuals with aphasia, namely right-hemisphere function as well as vocal abilities, and promotes use of both sides of the brain, music can serve as a possible tool in helping this population make gains in communication.

The development of aphasia choirs across the nation was based off of the previously-mentioned benefits of singing, as well as the psychological and social benefits of singing in a group (Tamplin et al., 2013; Vink et al., 2003). The Bridges Choir, formed in DeKalb, Illinois, was modeled off of these existing aphasia choirs (Lanza & Mayer, 2017). Held in Oak Crest Retirement Center, the choir is comprised of about 10 participants with stroke-induced aphasia or other neurogenic communication disorders and rehearses weekly under the guidance of a musically-trained speech-language pathology graduate student.

While qualitative information exists to demonstrate the benefits of choir participation on cognitive-communicative disorders (e.g., Sole et al., 2010), there is a lack of quantitative data to support these effects. The knowledge gap in this subject area served as the premise for my

research project this semester. My role in this research project was to provide quantitative evidence supporting the theory that choir participation can help individuals with aphasia make significant gains in functional communication. In order to accomplish this, I had to develop a procedure for incorporating language sample collections into weekly choir rehearsals, collect appropriate and adequate language samples, and find a method to analyze the collected data.

In order to collect adequate language samples from the participants (i.e., 300—400 words; Hallowell, 2017), I had to prepare questions that could elicit language from the participants in three different genres: procedural, narrative, and picture description. The use of three different genres allowed for varying complexity of comprehension and production required from the participant, and therefore, allowed for a more comprehensive assessment of their strengths and weaknesses in communication (Hallowell, 2017). In addition to prompts developed over the summer of 2017 using OSEEL funding (Student Engagement Fund, C. Wiersma, Summer 2017), I developed a similar set of questions that would enable participants to provide instructions on a task and tell a familiar story. I selected Weber “Story Starters” Photo Cards (Super Duper Publications) that I felt provided enough detail for participants to talk about. In order to ensure that each stimulus elicited language samples of adequate length, my faculty mentor and I asked the help of Speech-Language Pathology graduate students to test each language prompt on at least two neurologically intact individuals between the ages of 55 – 75 (i.e., age-matched roughly to choir participants). Prompts and pictures that elicited an average of 45 seconds of language or more (i.e., roughly 100 words per prompt) were added to the list of language sample stimuli for the study; those that did not meet these criteria were discarded.

To test the hypothesis that choir participation (i.e., the act of group singing) boosts functional word retrieval, we collected language samples from each choir participant just prior to and immediately following each choir rehearsal. Before every rehearsal, I prepared the language

sample collection materials by printing the pre-and post-choir prompts on slips of paper as well as instructions on how to collect the samples. This was then incorporated into individual packets that were distributed to each research assistant-choir participant pair (see below). The paper prompts provided a visual guide for participants with possible auditory or working memory weaknesses, and the instructions for research assistants ensured reliability of language sample collection procedures (Lanza & Mayer, 2018). Speech-Language Pathology graduate students, who were assigned to help with weekly choir rehearsals as part of their supervised client load, were matched individually and quasi-randomly with choir participants from whom they would collect language samples. All language sample interactions were recorded for later transcription using portable recording devices. This process was repeated immediately following each choir rehearsal (i.e., pre- and post-choir language sample collection). Similarly, I was partnered with a participant from whom I collected language samples prior to and following each choir rehearsal.

The graduate students and I then orthographically transcribed the collected language samples and then uploaded them to a shared drive with all identifying data removed. In order to capture the expressive language abilities of the participants, I reviewed 5 different methods of language sample analysis and tried to determine which method was most appropriate to capture the data sought by the research questions. Ultimately, my mentor and I decided on three methods: (1) Nicholas and Brookshire's Correct Information Units (CIU) analysis (1993), (2) Mayer and Murray's Percent Word Retrieval (%WR) analysis (2003), and (3) Mayer and Murray's Percent Substantive Verbs (%SV) analysis (2003).

There were several outcomes that came about as a result of this semester's research project. First, the collection of language samples before and after choir demonstrated that collection of quantitative data supporting the effects of choral participation on the language of individuals with aphasia is feasible. Language samples provided a snapshot of participants'

expressive language prior to and immediately following choir rehearsals that could be recorded and objectively analyzed. Moreover, this research project supported the large literature base demonstrating that objective data analysis on language samples is possible using established discourse methods. In this project, the word-finding skills of individuals with aphasia or related cognitive-communicative disorders were the focus, and this was measured by finding the amount of meaningful information that the individuals provided (CIU), their ability to efficiently use nouns (%WR), as well as the quality of the verbs they produced (%SV). These measures allowed the participants' language samples to be quantified and compared.

Due to time constraints, I was not able to analyze all of the transcriptions we have collected throughout the semester. However, I was able to accomplish two other objectives during this timeframe. First, I established a feasible and reliable protocol for collecting quantitative data from participants prior to and following choir rehearsals. I was able to do this by developing a procedure for collecting language samples from the participants and then coordinating the collection with my faculty advisor and the students assisting with choir rehearsals. This procedure can be used in future research on the choir. Second, under the guidance of my faculty mentor, I selected measures from available discourse analysis methods that best captured the word-finding skills of individuals with aphasia and related cognitive-communicative disorders. Through these measures, I would be able to analyze the amount of meaningful information that individuals provide within the sample, as well as the quality of their word choice.

The Student Engagement Fund was able to contribute to my academic experience by first, allowing me to dedicate more time to the project. Because of the compensation I received, I was able to allocate a minimum of 5 hours per week to gathering and analyzing the necessary information I needed to answer my research questions. The funding also allowed me to commute

to and from Oak Crest Retirement Center, the research site, on a weekly basis. Second, the student engagement fund allowed me to get hands-on learning experience in the field of speech-language pathology. By interacting with choir participants, I was able to witness firsthand the manifestation of neurogenic communicative disorders, such as aphasia, and hear personal stories describing how these disorders affected the daily lives of individuals in the older adult population. I was given firsthand experience using established assessment procedures in the field by having the opportunity to collect and analyze participant language samples. I was also given first-hand experience in research methods, by being guided on how to design a research experiment as well as how to execute the research.

Finally, the Student Engagement Fund gave me an opportunity for personal growth through leadership experience. Because the efficient language sample collection from multiple participants involved the work of a whole team of students, I was able to develop my leadership skills by instructing the students on how to carry out collection and transcription procedures as well as by coordinating the sample collection during choir rehearsals. These opportunities to take a leadership role would not have been possible in the traditional classroom setting.

The goal of my research project this semester was to provide quantitative data showing the effects of choral singing participation for individuals with aphasia and related cognitive-communicative disorders. In order to accomplish this, I had to establish a data collection procedure and a useful method for analyzing the data, and then carry out these procedures during weekly Bridges Choir rehearsals. Under the guidance of my faculty mentor and support from the Student Engagement Fund, I was able to accomplish this and hopefully, contribute to the knowledge base in this area of the research.

## References

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November 5 Printed Prompts

Tell me how you would go about making a sand castle.

Tell me about the strangest thing you have come across.

Tell me how you would go about playing hide-and-seek.

Tell me about a time when a small gesture from a stranger made a big impact on you.

Fall 2018  
Bridges Choir – Language sample data collection  
November 5, 2018

### **Objective**

Each choir participant will ideally complete a language sample (about 60 seconds) for each of 3 genres:

1. Narrative (e.g., “Tell me about your favorite movie”)
2. Procedural (e.g., “Tell me how you make coffee”)
3. Picture description (from picture cards)

### **Pre-Choir Questions**

Before choir rehearsals, each choir participant will be asked 1 set of questions from each genre for a total of 3 questions. The collection of language samples should take 60-90 seconds at the most per question. Only one prompt can be given to the participant per question (e.g. “can you tell me more?”).

**\*\*Procedural prompt and picture stimulus have specific instructions. See below.**

#### Procedural Prompt

- Instructions: Start the recording device and place the printed prompt in front of the participant. Read the prompt out loud. Then, say, “Tell this to me as if I have never done this before.”
- Tell me how you would go about making a sand castle.

#### Narrative Prompt

- Tell me about the strangest thing you have come across.

#### Picture Stimulus (1)

- Instructions: Start the recording device and place the picture stimulus in front of the participant. Then, say, “Tell me a story about this picture with a beginning, middle, and end.”

### **Post-Choir Questions**

During the social break, each choir participant will be asked another set of questions comprised of 1 question per genre. The collection of language samples should take 60-90 seconds at the most per question. Only one prompt can be given to the participant per question (e.g. “can you tell me more?”).

**\*\*Procedural prompt and picture stimulus have specific instructions. See below.**

#### Procedural Prompt

- Instructions: Start the recording device and place the printed prompt in front of the participant. Read the prompt out loud. Then, say, “Tell this to me as if I have never done this before.”
- Tell me how you would go about playing hide-and-seek.

#### Narrative Prompt

- Tell me about a time when a small gesture from a stranger made a big impact on you.

#### Picture Stimulus (1)

- Instructions: Start the recording device and place the picture stimulus in front of the participant. Then, say, “Tell me a story about this picture with a beginning, middle, and end.”