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The Effects of Spoken Self-Disclosure Scripts on Nonaphasic Listeners' Perceptions of People with Aphasia

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THE EFFECTS OF SPOKEN SELF-DISCLOSURE SCRIPTS ON NONAPHASIC LISTENERS' PERCEPTIONS OF PEOPLE WITH APHASIA

A Thesis Presented

by

COLLEEN B. WARD

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ABSTRACT

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Abstract body:

Purpose: The purpose of this study was to investigate the effects of spoken self-disclosure scripts on nonaphasic listeners' perceptions of people with aphasia (PWA). Self-disclosure is a tool that PWA can utilize in the event that they want a conversation partner to know of their communication disorder. However, limited research has been conducted on the effects of aphasia self-disclosure or whether it affects perceptions of PWA from neurotypical communication partners. If self-disclosure is determined to make a positive impact on a communicative interaction, it could be grounds for encouraging PWA who are interested to develop a self-disclosure script or use an aphasia identification card.

Methods: 239 middle-aged adults participated in this study, which was a remote survey conducted on Qualtrics via Prolific. Aphasia self-disclosure scripts from two speakers (one female and one male), as well as neutral scripts from the same two speakers, were used as stimuli. After hearing either the self-disclosure or the neutral script, participants were asked to rate various speaker attributes (i.e., intelligence, confidence, friendliness, and kindness), as well as their own experience (i.e., engagement, patience, comfort, and ease of listening) while listening to the speaker.

Results: Overall, the listeners who heard the aphasia self-disclosure scripts rated the speakers' attributes more highly than the listeners who heard the script containing neutral information. In addition, those in the self-disclosure listening group rated their listening experience more highly than the group of participants who received the neutral information. The aphasia self-disclosure script appeared to have a larger effect on perceptions of the male speaker as compared to the female speaker.

Conclusion: Nonaphasic listeners' attitudes about PWA, as well as their listening experience, improve when spoken self-disclosure is involved in communication. Future research should examine the impact of self-disclosure on remote and in-person interactions between neurotypical individuals and PWA, as well as investigate the effectiveness of implementing virtual Communication Partner Training (CPT) programs.

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CHAPTER 1

INTRODUCTION

Aphasia Awareness in the General Population

Aphasia is a communication disorder, typically caused by stroke, that affects a person's ability to understand and/or express language. This disorder affects anywhere from 2-4 million individuals in North America alone (Simmons-Mackie, 2018). Aphasia is not rare, but as many as 84% of people have never heard the term (Aphasia Statistics, n.d.). As summarized in a literature review by Simmons-Mackie et al. (2020), surveys conducted over almost two decades around the world showed consistently low levels of both *aphasia awareness* (i.e., having heard the term "aphasia") and *basic knowledge of aphasia* (i.e., being able to define it correctly). All surveys showed levels of basic knowledge below 20%; in the United States, current estimates are under 10% (National Aphasia Association, 2020; Simmons-Mackie et al., 2020). Additionally, one survey reported within Simmons-Mackie et al. (2020) was repeated after 16 years in the United Kingdom (Code et al., 2001; Hill et al., 2019). Hill and colleagues (2019) reported that while more people had heard of the term "aphasia" over time, the level of knowledge the general public possessed about aphasia had not improved.

In a study by Collier, Blackstone, and Taylor (2012), people with complex communication needs (e.g., people with developmental delay, acquired disorders, and cerebral palsy) identified accommodations they would like to see implemented in the community. The most frequently chosen were those relating to their communication with other people, i.e., having patience and giving more time to relay their message, talking to them like they are an adult and using a normal pitch and loudness, talking directly to

them rather than to someone who is with them, etc. The acknowledgment of and respect for a person with a complex communication disorder is critical to the facilitation of their community interactions. Similarly, people with aphasia report that widespread lack of knowledge about their communication disorder is a major barrier to their community participation (Howe, Worrall, & Hickson, 2008) and one of the things they'd most like to change about how aphasia affects their lives (Wallace et al., 2017).

It is likely that many individuals have interacted with people who have aphasia (PWA) without knowledge of their communication abilities or the difficulties that may arise in conversation. Lack of knowledge about aphasia may contribute to negative attitudes towards PWA; although aphasia in and of itself does not disturb an individual's intellectual competence, listeners unfamiliar with aphasia often judge PWA to be less intelligent than non-aphasic speakers. This is especially true for those with nonfluent aphasia (Duffy, Boyle, & Plattner, 1980; Harmon, Jacks, Haley, & Faldowski, 2016; Khvalabov, 2019). Perceiving PWA as unintelligent may lead listeners to exhibit conversational behaviors that exclude the PWA and fail to reveal their competence (Howe et al., 2008; Kagan, Black, Felson Duchan, Simmons-Mackie, & Square, 2001). This may leave PWA feeling isolated, misunderstood, depressed, frustrated, and hopeless (Worrall et al., 2011). Notably, it appears that aphasia education improves perceptions of PWA's intelligence: graduate students in speech-language pathology, who receive intensive clinical education about aphasia, give PWA higher intelligence ratings than do undergraduate students without this background knowledge (Harmon et al., 2016). Further, graduate students expressed greater comfort in listening to speakers with

aphasia. These changes in attitude may support a greater willingness to engage directly with PWA in and out of therapy settings in a way that supports their participation.

Communication Partner Training

As previously mentioned, it has been documented that when communication partners receive education regarding aphasia, PWA are better able to obtain communicative access and increase participation. Thus, the process of Communication Partner Training, or CPT, aims to teach communication partners how to best support conversation with PWA. The process of CPT includes partaking in a dedicated training program that helps to improve communication between people with communication disorders and their communication partners. In a scoping review of CPT for unfamiliar communication partners (e.g., paid workers) by Tessier, Power, and Croteau (2020), it was reported that communication partners influence factors of an interaction that can either facilitate or cause a barrier in conversation with PWA. These factors include their knowledge of aphasia, their attitudes, communication abilities, and willingness to communicate with someone who has a communication disorder. Accordingly, it is important for people without communication disorders to learn how to communicate with people who have them. Communication partner training may reduce fear, discomfort, and impatience, which may minimize negative communication experiences and the likelihood of communication breakdowns. In addition, there is evidence that communication partners who do not have communication disorders have a desire to improve their methods of interacting with people who do (Brown, McGahan, Alkhaledi, Seah, Howe, & Worrall, 2006).

In the area of aphasia, CPT has been found to increase the communicative effectiveness of partners without aphasia, which encourages participation for PWA and is recommended for use by people with aphasia and their care/communication partners (Simmons-Mackie et al., 2010; Simmons-Mackie, et al., 2016). Training programs have shown that participants in these studies improved their confidence, knowledge of, and ability to communicate with people who have communication disorders such as aphasia. In addition, trainees reported more positive emotional experiences, less stress during these interactions, and increased patient communicative satisfaction (Tessier et al., 2020). However, studies investigating CPT with unfamiliar partners have largely enrolled healthcare professionals or healthcare students. This is a critical area where people with communication disorders, including aphasia, must be understood and feel welcome, but nurses, speech-language pathologists, and other health professionals are not the only people with whom they desire to communicate. Fully supporting participation for people with communication disorders, including aphasia, requires training of all communication partners. Therefore, formal CPT programs or another method of learning is needed to improve the quality of everyday interactions for people with communication disorders.

CPT is an ideal way for people to learn about and gain experience communicating with someone who has aphasia because they can get feedback and communication tips as well as collaborate with PWA to facilitate conversation. While CPT is the preferred method of education for people who are consistent communication partners for PWA, the use of CPT is not always feasible when PWA are in new or transient environments. Bus drivers, cashiers, or the receptionists at the doctor's office are all people who likely have not had extensive training about aphasia or how to best interact with someone who has

it. However, conveying education by way of self-disclosure is a method that can be more accessible; it is a tool that can be utilized as needed by PWA in more environments with a greater population that has limited awareness.

Self-Disclosure of Communication Disorders

In everyday interactions with unfamiliar communication partners, aphasia self-disclosure, i.e., the act of revealing one's aphasia diagnosis to other people, may help facilitate a conversation. It is not the same as a training program, but a short disclosure script can contain information that is beneficial to a new communication partner (e.g., presence of a disorder, cause, communication tips, etc.).

When approaching a new communicative interaction, a speaker with any communication disorder, aphasia included, gets to make the choice of whether to disclose their condition. This can be a complex decision because it often involves multiple factors. Isetti (2020) described a model illustrating these factors in the context of self-disclosure of a communication disorder during a job interview. The author did this by completing a literature review about disclosure of "invisible stigmas" or health conditions and forming a model that summed up the factors at play in disclosing a communication disorder. The model began with the individual weighing the cost versus benefit of five major components. The first component is individual factors (e.g., a person's willingness to take risks, prior experience with self-disclosure, etc.); the second is the characteristics of a communication disorder (e.g., anticipated stigma held by the individual, prognosis, etc.). Third, specific workplace factors (e.g., company policies, accessibility, etc.) play an important role, as well as disclosure self-efficacy (e.g., an individual's knowledge about their disorder, confidence about disclosing, etc.). Finally, the last component involved in

self-disclosure is an individual's personal motivation (e.g., how disclosing can benefit them).

Isetti also discussed some possible reasons for nondisclosure which are important to consider: fear of discrimination or a breach of confidentiality, losing health coverage, losing the potential for upward mobility within a company, etc. In this communication disorder disclosure model, these factors would be weighed using a cost-benefit analysis, which would lead to a decision of whether to disclose their communication disorder. Once the individual makes that choice and completes the associated action, they can begin to process the result as feedback for the future.

The decision to disclose the presence of a communication disorder belongs to the speaker who has the diagnosis, but it is also important to consider the potential effects on the conversation after self-disclosure. These effects influence listener perceptions, and the outcome of these perceptions may influence whether a person chooses to disclose their communication disorder when in an interaction with a new communication partner. There is no prior research examining the effects of self-disclosure of aphasia on listener perception. However, previous research on stuttering and voice disorders provides insight into what happens to the perceptions held by neurotypical listeners after receiving some sort of disclosure from a speaker with a communication disorder. In multiple studies, perceptions of adults who stutter were more positive following a self-disclosure statement as compared to no disclosure statement (Byrd, Croft, Gkalitsiou, & Hampton, 2017; Byrd, McGill, Gkalitsiou, & Cappellini, 2017; Healey et al., 2007).

If a speaker with a communication disorder decides to disclose their condition, they also get to make a choice regarding what information to provide. There is more than

one way to disclose, and the choice can be made based on the demands of the communication interaction as well as the speaker's comfort level. Sometimes, solely a simple definition of their disorder is sufficient (e.g., "Aphasia affects my language"); other times, a person with a communication disorder may decide to give more detailed information, e.g., the causes of their disorder, specific areas of communication difficulty, intellectual competence (e.g., "I am intelligent but have problems with language"), and how a conversation partner can support communication.

Some research has investigated whether the type of disclosure statement impacts perceptions of adults who stutter (Byrd et al., 2017). Participants in Byrd et al. (2017) viewed short segments of simulated job interviews in which the "interviewee" stuttered. The videos either contained an informative self-disclosure statement (e.g., "You may hear me repeat sounds or phrases"), an apologetic self-disclosure statement (e.g., "Bear with me"), or no self-disclosure statement. Participants then completed a survey probing their perceptions of the speaker's personality (e.g., friendliness, confidence) and competence (e.g., intelligence). Additionally, follow-up questions were given to participants to gauge the level of personal experience they had with stuttering. Overall, informative self-disclosure statements, but not apologetic statements, elicited more positive ratings as compared to no disclosure statement. In addition, prior knowledge of stuttering was observed to positively influence ratings of listener engagement. Thus, both self-disclosure and prior knowledge of stuttering improve the attitudes of neurotypical listeners.

Research has also examined the effects of disclosure of and education regarding voice disorders on listener attitudes (Eadie et al., 2017; Lallh & Rochet, 2000). In Eadie et al. (2017), participants listened to a sentence produced by speakers with and without

adductor spasmodic dysphonia (ADSD) and provided ratings of the speakers' personal attributes, perceived vocal effort, and their own comfort as listeners. One group of listeners received no information about the speakers, a second group read a disclosure statement for each speaker containing the speaker's diagnostic label (e.g., "a voice disorder called spasmodic dysphonia" vs. "no voice concerns"), and a third group received the disclosure statement alongside written and video educational materials about ADSD (e.g., the definition of the disorder, the etiology, what ADSD sounds like, a visual diagram of the vocal mechanism, and videos of individuals with ADSD describing how the disorder has affected their lives). Ratings of the speaker's personality were higher in listeners who received the disclosure statement (diagnostic label) as compared to those who received no information. However, receiving extensive educational information over the course of just one session did *not* lead to higher personality ratings. Further, no effects of disclosure or education were observed on ratings of perceived vocal effort, listener comfort, or the speaker's social desirability or intelligence. Therefore, this study suggested that disclosure may improve some aspects of listener perceptions of a speaker with ADSD, but that extensive educational materials do not provide additional benefit.

Lallh and Rochet (2000) investigated the effects of education about voice and resonance disorders on participants' attitudes toward women with these disorders. One group of participants read two pages of educational information about voice and resonance disorders; one group read two pages of neutral information about animal communication. The educational information included definitions of the disorders, causes, effects of disorders on one's life, and basic information about treatment methods.

Then, both groups listened to a range of nine speakers: three normophonic speakers (speakers with no voice disorder), three speakers with moderate dysphonia due to vocal nodules, and three speakers with resonance disorders (moderate levels of hypernasality and nasal emission). Overall, the normophonic speakers were rated most positively out of the three in terms of personality, followed by speakers with a voice disorder and then speakers with a resonance disorder. Negative ratings were seen to generalize from the areas of communication to other areas, such as intelligence, kindness, and physical appearance. The authors suggested that voice disorders were rated more positively than resonance disorders because more people have encountered someone with disordered voice quality or experienced temporary voice quality changes themselves as a result of an illness (e.g., cold), as opposed to hypernasality. Consistent with the findings of Eadie et al. (2017), there was not a significant improvement in ratings from participants who received extensive educational information versus participants who received no disorder-specific information.

In sum, (self)-disclosure of stuttering and voice disorders such as ADSD may improve listeners' attitudes towards speakers with those conditions (Byrd et al., 2017; Eadie et al., 2017; Healey et al., 2007). However, providing considerable educational materials in a single session does not seem to effectively shift listener attitudes (Eadie et al., 2017; Lallh & Rochet, 2000).

Turning back to aphasia, some PWA have reported using self-disclosure as a strategy and experiencing improved attitudes from conversation partners upon disclosing their aphasia (Howe et al., 2008; Harmon, 2020; Le Dorze, Salois-Bellerose, Alepins, Croteau, & Hallé, 2014). When asked about conversational facilitators involving other

people, a participant in Howe et al. (2008) responded, "I… say it, 'I've had a stroke.' And… it's amazing how it changes people to… me… then they have more… patience." This evidence is powerful, but few experimental studies have investigated the impact self-disclosure of aphasia has on conversation.

Ward and Mack (under review) investigated whether aphasia self-disclosure, via an aphasia identification (ID) card, impacted the processing of aphasic language by non-aphasic listeners. Half the participants viewed an aphasia ID card before beginning the experiment and the other half did not. The card displayed (simulated) biographical information about the speaker, as well as the diagnosis of aphasia, cause, and tips for communication. Participants then followed instructions that were recorded by a speaker with nonfluent aphasia in two separate blocks while their eye movements were tracked, with an intervening block in the middle designed to serve as a chance for them to hear the speaker make semantic paraphasias. Results showed that aphasia self-disclosure by way of aphasia ID cards may impact processing of aphasic language. The group that did not view the card showed higher levels of distraction or "second-guessing" the speaker's intended message, especially after observing language errors. On the other hand, the group that did view the ID card prior to beginning the experiment demonstrated increased attention to the linguistic task after observing the semantic paraphasias. These findings motivated further research into whether aphasia self-disclosure changes neurotypical individuals' attitudes or perceptions of a speaker with aphasia. For example, it is possible that aphasia self-disclosure improves attitudes towards the speaker, which results in more attentive listening and language processing. The purpose of the present study was to

investigate how aphasia self-disclosure affects neurotypical perceptions of PWA's intelligence and personality, as well as their listening experience.

Aims of the Current Study

The purpose of this study was to investigate the attitudes of listeners who heard an aphasia self-disclosure statement from a speaker with nonfluent aphasia, as compared to those of listeners who did not hear a self-disclosure statement. We used a remote survey data collection method to obtain information regarding people's thoughts and reactions to audio files of two speakers with nonfluent aphasia. Half of the participants heard a disclosure script whereas half heard a script about a neutral topic (the weather). All were asked to rate their perceptions of the speaker's attributes (i.e., intellect, personality) and their experience as listeners (e.g., comfort, patience). For each question of the survey, a sliding scale with no numbers featured two adjectives on either end (cf. Eadie et al., 2017; Funke & Reips, 2012). The left side of the scale featured the "negative" perception (e.g., uncomfortable, unintelligent, hard, etc.) and the right side of the scale featured the "positive" perception (e.g., comfortable, intelligent, easy, etc.). We investigated the following questions:

RQ1: Does aphasia self-disclosure impact neurotypical listeners' perceptions of intelligence for a speaker with nonfluent aphasia?

To answer this question, we analyzed participant responses to a survey question regarding intelligence. We hypothesized that participants who received aphasia self-disclosure from a speaker with nonfluent aphasia would rate their intelligence higher than participants who did not receive the disclosure. This hypothesis is in part because these participants heard a direct statement within the disclosure script involving intelligence,

e.g., “Aphasia affects my language, not my intelligence.” Additionally, results from Byrd et al. (2017), studying neurotypical individuals’ perceptions of people who stutter, indicated that individuals who self-disclosed their stuttering using an informative disclosure statement were rated as more intelligent than individuals who did not self-disclose.

RQ2: Does aphasia self-disclosure impact whether neurotypical listeners perceive a speaker with nonfluent aphasia as kind or friendly?

To answer this question, we analyzed participant responses to survey questions regarding kindness and friendliness. Our hypothesis was that self-disclosure would not greatly impact listeners’ perceptions of the speaker’s friendliness or kindness, because they would not have significantly more time or exposure to the speaker’s personality to form negative or positive views of those aspects as compared to the group who did not receive the self-disclosure. The scripts utilized in this experiment did not give participants much evidence regarding the speakers’ friendliness/kindness, in contrast to intelligence, which was directly targeted in the self-disclosure script statement. It is possible that additional social context and/or more information regarding the speakers’ personalities would be necessary for participants to make judgments on these attributes, and this is what we expected to find. However, the alternative possibility should be considered: listeners might rate the speaker with aphasia who discloses as more friendly than the speaker with aphasia who does not disclose. Results from Byrd et al. (2017) demonstrated that participants rated a speaker who stuttered as friendlier if they made an informative self-disclosure statement, as compared to a speaker who stuttered but did not make any kind of self-disclosure statement to their communication partner. This, if

translated to aphasia, would indicate that individuals would rate a speaker with nonfluent aphasia as friendlier and kinder if they made an informative self-disclosure statement rather than no disclosure statement at all.

RQ3: Does aphasia self-disclosure impact whether neurotypical listeners perceive a speaker with nonfluent aphasia as confident?

To answer this question, we analyzed participant responses to a survey question regarding confidence. We hypothesized that a speaker disclosing their communication disorder could influence listeners' perceptions of the speaker's confidence in a positive way. In Byrd et al. (2017), it was demonstrated that individuals who stuttered but used an informative disclosure statement were perceived as more confident than individuals who stuttered but did not disclose their communication disorder. In addition, in regard to the disclosure decision model discussed in Isetti (2020), someone self-disclosing may lead a communication partner to believe that person is less shy or is more of a risk taker, which could influence perceptions of confidence in the same way.

RQ4: How does aphasia self-disclosure affect neurotypical listeners' experience while listening to a speaker with nonfluent aphasia?

To answer this question, we analyzed participant responses to survey questions regarding listener experience (i.e., distractibility, comfort, patience, ease of listening). We hypothesized that individuals who received the self-disclosure would be less distractible and more patient. As demonstrated in Ward and Mack (under review), even a short self-disclosure statement can cause non-aphasic individuals to pay more attention to the language produced by a speaker with aphasia. Additionally, Byrd et al. (2017) reported

that participants who heard an informative self-disclosure statement from a speaker who stuttered rated their own engagement as higher, compared to participants who did not hear a speaker give a self-disclosure statement. In terms of patience, we believed it would be increased for individuals who heard the self-disclosure statement as the statement script had an education component targeting it, e.g., “Please… give me time to communicate.”

However, we hypothesized that the comfort level of the participants would not be drastically different between groups, because comfort may come with additional experience with aphasia. While Harmon and colleagues (2016) demonstrated that graduate students in speech-language pathology, individuals who had awareness and knowledge of aphasia, reported greater comfort while listening to speakers with aphasia as compared to students without this educational background, this knowledge was gained over time, rather than in a single experiment or with one single person who had aphasia.

We thought it possible that participant attentiveness, patience, and comfort could impact how they viewed ease of listening during the task. If participants who heard the aphasia self-disclosure were less distractible, more patient, and more comfortable than participants who did not hear any self-disclosure, we would expect them to also report an ease of listening that was higher than the participants who did not listen to the self-disclosure.

CHAPTER 2

METHODS

Participants

A total of 240 participants were recruited. This sample size was chosen based on a power analysis conducted with G*Power 3 software (Faul et al., 2007). Assuming 20% data exclusion (i.e., 48 participants), the resulting sample size of 192 (96/group) has 82.6% power (β) to detect a moderate effect size (Cohen's $d = 0.5$) with a one-tailed t-test for two independent samples at a significance threshold of $\alpha = 0.00625$ (0.05/8, applying a Bonferroni correction to the eight comparisons of the experiment). One-tailed tests were used because the expected effects were unidirectional (improved attitudes with aphasia self-disclosure). Of the 240 participants who completed the survey[1], one participant requested for their data to be deleted. In contrast with our expectations of 20% data exclusion, no other participant data was excluded. The final number of participants whose data were analyzed was 239.

Participants were recruited using Prolific (Peer et al., 2017). They were considered part of a middle-aged range as they were all between 40-59 years old. The middle-aged range was chosen because participants within this age range were close to the age of the speakers chosen for this study. Because the incidence of aphasia rises with age, it was thought to be more likely that middle-aged individuals might encounter PWA

[1] Participants who returned the survey through Prolific before completion (n=4) or were excluded through demographic questions (potentially by incorrect mouse selection) and refreshed the survey to complete a second time (n=2) were not included in the participant recruitment target and were excluded from data analysis.

in a social setting more often than younger adults. Also, adults in this demographic are largely still in the workforce; therefore, they might encounter PWA in a work setting more often than older, retired adults. The parameters for a "middle-age" range were gathered from other studies involving this population (Helfer et al., 2017; Helfer et al., 2010). Participants all self-reported having normal speech and language skills, normal hearing, and a high school diploma or GED. All participants self-reported living in the U.S. and being fluent in English, though it was not required that English be their first or only language. Participant characteristics are shown in Table 1. There were no significant differences between participant groups in terms of age, gender, race/ethnicity, or education.

	Advocacy Script Condition	**Weather Script Condition**
Age	M(SD): 48.89(6.01)	M(SD): 49.04(6.08)
Gender	Women=60 Men=57 Non-Binary=0	Women=62 Men=59 Non-Binary=1
Education	High School or GED=26 Associate's=23 Bachelor's (BA/BS/other)=44 Master's (MA/MS/other)=18 Doctoral (PhD/MD/other)=6	High School or GED=33 Associate's=17 Bachelor's (BA/BS/other)=47 Master's (MA/MS/other)=19 Doctoral (PhD/MD/other)=6

Race/ Ethnicity	American Indian or Alaska Native=0 Asian=1 Black or African American=12 Hispanic or Latino/Latina/Latinx=4 Multiracial or other=2 White=98	American Indian or Alaska Native=1 Asian=6 Black or African American=8 Hispanic or Latino/Latina/Latinx=1 Multiracial or other=1 White=105

Table 1: Demographic information for each participant group.

Stimuli

Auditory Linguistic Stimuli

The auditory linguistic stimuli consisted of one of four approximately 1-minute-long scripts produced by speakers with Broca's (nonfluent) aphasia. Speakers for this experiment were chosen from the Script Training database within AphasiaBank (Fridriksson et al., 2012). There were two speakers, one female and one male; both were documented to have a diagnosis of nonfluent aphasia as well as apraxia of speech (AOS). These scripts and speakers were chosen because of their perceptual clarity as compared to others in the set. Speaker 1, the female speaker, was 50 years old and 72 months post-stroke, while the male speaker (Speaker 2) was 60 years old and 56 months post-stroke. Scores for subtest six of the Apraxia Battery for Adults, 2nd edition, were used to rate the severity of speakers' apraxia of speech. The female speaker's sub-score on the Apraxia Battery for Adults was a 13 (on a scale from 0-15, with 15 being the most severe) and the male speaker's sub-score was a 9. The female speaker demonstrated noticeably more characteristics of apraxia of speech. They both received a fluency score of 4 on a scale of

0-10 from the Western Aphasia Battery-Revised (WAB-R), with 10 being the most fluent (Kertesz, 2006).

Scripts

Participants were randomly assigned to one of four scripts. The scripts were retrieved from AphasiaBank (MacWhinney et al., 2011) with written permission from the AphasiaBank directors, Brian MacWhinney and Davida Fromm, for use in this experiment. Two scripts were recorded by the male speaker with aphasia and two by the female speaker with aphasia. For each speaker, one script was an aphasia self-disclosure statement and one was about a neutral topic (the weather in the southern U.S.). Descriptions of each type of script, as well as transcripts, are below:

Aphasia self-disclosure script

Description: The aphasia self-disclosure script was a short script that included basic information regarding the speaker's aphasia and mimics the types of information one may see on an aphasia ID card. There were statements about the speaker's diagnosis and what it means to have aphasia, as well as two strategies that unfamiliar communication partners could use when interacting with the speaker.

Transcript: "I have aphasia. This means I have difficulty with language. Aphasia affects my language, not my intelligence. It is hard for me to understand what people are saying and to find the words to speak my thoughts. Please speak directly to me and give me time to communicate."

Control script (Weather)

Description: The weather script was a short script that contained information about the weather in the southern United States. It did not contain information about the speaker's aphasia or give communication strategies.

Transcript: "The weather in the Southern United States is usually very pleasant. During the spring it is warm and sunny. During the summer it is very hot with frequent thunderstorms. During the fall it is cold and the leaves change colors. The winter is usually cold and dry and it rarely snows."

Rating survey about listener attitudes

Participants completed an 8-item attitude rating survey (Table 2). They were asked to indicate where their attitudes fell on a scale between two polar adjectives (e.g., patient-impatient). The questions involving the sliding scales were presented in a random order.

Four of the eight items probed participants' experience as listeners (im*patient-patient, uncomfortable-comfortable, distracted-engaged, hard-easy* (to understand the speaker)). These questions were preceded by an introductory phrase ("While listening to the speaker, I felt _____" or "I felt that understanding the speaker was _____"). Similar items were used in Eadie et al. (2017), Harmon et al., (2016), and Byrd et al., (2017).

Four items probed listeners' attitudes towards the speaker's attributes, including intellect (two items: *intelligent-unintelligent, confident-unsure*), and personality (two items: *friendly-unfriendly, kind-unkind*). These were preceded by the phrase "I think that the speaker is _____."

#	Question	Left End	Right End
1	When listening to the speaker, I felt ____	Distracted	Engaged
2	When listening to the speaker, I felt ____	Impatient	Patient
3	When listening to the speaker, I felt ____	Uncomfortable	Comfortable
4	I felt that understanding the speaker was _____	Hard	Easy
5	I think that the speaker is _____	Unintelligent	Intelligent
6	I think that the speaker is _____	Unsure	Confident
7	I think that the speaker is _____	Unfriendly	Friendly
8	I think that the speaker is _____	Unkind	Kind

Table 2: Slider questions from the rating survey.

Procedure

Participants who were eligible for the study and were interested in participating after reading the study description in Prolific followed a link to our Qualtrics survey. Due to a programming error, participants saw the "preview" version of the experiment, meaning they saw information intended for the researchers (e.g., timing data for clicks on the page, etc.). We are confident this did not have a significant impact on results, as it did not change the content or demands of the experiment.

First, participants viewed the online consent form and clicked "I agree" to participate in the study or "I do not agree." If participants clicked "I do not agree," the

experiment ended. Second, participants were asked demographic questions pertaining to the study's inclusion/exclusion criteria and other key demographic factors (gender and ethnicity). Third, participants listened to a "test" audio file (~20 seconds) and answered an open-ended question to ensure that the participant's audio was working and they were attending to the stimuli.

Fourth, participants listened to a short (~1 minute) script recorded by a speaker with aphasia. Fifth, after hearing the experimental script, participants were asked an open-ended question about their experience as a listener: "Please provide 1-3 comments about what it was like to listen to the speaker." This question was placed before the attitude rating questions with the intention to probe listener experience without the potential bias that comes from more specific questions. Analysis of the open-ended question data is ongoing and not part of this thesis project. Sixth, participants answered a multiple-choice question about the topic of the recording (to test for attention and comprehension), and then an open-ended question probing their thoughts and emotions while listening to the speaker.

Seventh, participants completed the Attitude Rating Survey (in which they answered eight slider questions rating their experience of the speaker and the speakers' attributes). Eighth, after completing the rating survey, participants were (re-)informed that the speaker had aphasia and were asked two questions about their prior knowledge of aphasia. Both questions were adapted from the National Aphasia Association Aphasia Awareness Survey (2020): "Prior to this experiment, had you ever heard the term aphasia?" and "Do you know someone who has been diagnosed with aphasia?" (Options for both questions were "Yes" or "No."). Ninth, participants read the debriefing form and

were given the option to have their data included or excluded from the study. Finally, participants followed a completion link back to Prolific, indicating that they had completed the experiment.

Data Analysis

One-tailed t-tests were used with a significance threshold of $p<0.00625$ to detect statistically significant differences between the participant groups' attitude ratings with and without hearing aphasia self-disclosure (.05/8, applying a Bonferroni correction to the eight comparisons of the experiment). In addition, effect sizes (Cohen's *d;* Cohen, 1988) were computed for all slider questions comparing the two groups (aphasia self-disclosure vs. control) overall, and separately for each speaker. For reference, a Cohen's d value <0.2 is considered negligible, between 0.2-0.5 is considered small, between 0.5-0.8 is medium, and >0.8 is considered a large effect size. T-tests were not conducted for each speaker because this was not planned in the power analysi

CHAPTER 3

RESULTS

To discuss results of the rating survey, data will be separated into the four research questions. Numerical data can be found in Tables 3 and 4. Table 3 summarizes the overall pattern of results, collapsed across the two speakers. Meanwhile, Table 4 shows the pattern of results for each speaker separately.

RQ1: Does aphasia self-disclosure impact neurotypical listeners' perceptions of intelligence for a speaker with nonfluent aphasia?

Unintelligent/Intelligent

To answer this question, we analyzed the results from the slider question regarding speaker intelligence. There was a significant effect of self-disclosure, $p < 0.001$, where participants who heard the aphasia self-disclosure script rated the speakers as more intelligent, compared to the ratings of the speakers from participants who heard the weather script. This was a large effect size overall (Cohen's $d = 1.46$). There was a large effect of self-disclosure (Cohen's $d = 0.90$) found for intelligence in the Speaker 1 condition and a large effect for the Speaker 2 condition (Cohen's $d = 2.24$).

RQ2: Does aphasia self-disclosure impact whether neurotypical listeners perceive a speaker with nonfluent aphasia as kind or friendly?

To answer this question, we analyzed the results from the slider questions regarding speaker kindness and friendliness.

Unkind/Kind

There was a significant effect of self-disclosure for kindness, $p < 0.001$. Participants rated the speakers with aphasia as more kind when they had heard the aphasia self-disclosure script, as compared to the weather script. This was a small effect size overall (Cohen's $d = 0.44$). There was a small effect of self-disclosure (Cohen's $d = 0.22$) found for kindness in the Speaker 1 condition and a medium effect for Speaker 2 (Cohen's $d = 0.68$).

Unfriendly/Friendly

There was a significant effect of self-disclosure, $p < 0.001$, where the group of participants who heard the aphasia self-disclosure script rated the speakers as more friendly, compared to the ratings from the group of participants who heard the weather script. This was a medium effect size overall (Cohen's $d = 0.52$). The effect size of self-disclosure for friendliness from participants who listened to Speaker 1 was negligible (0.13), whereas there was a large effect of self-disclosure found from participants who listened to Speaker 2 (Cohen's $d = 0.93$).

RQ3: Does aphasia self-disclosure impact whether neurotypical listeners perceive a speaker with nonfluent aphasia as confident?

Unsure/Confident

To answer this question, we analyzed the results from the slider question regarding speaker confidence. There was a significant effect of self-disclosure, $p < 0.001$. The group of participants who listened to the aphasia self-disclosure script rated the speakers with aphasia to be more confident than the group who listened to the weather script. This was a medium effect size overall (Cohen's $d = 0.79$). A small effect of self-

disclosure (Cohen's d = 0.22) was found for confidence from participants who listened to Speaker 1 and a large effect for Speaker 2 (Cohen's d = 1.53).

RQ4: How does aphasia self-disclosure affect neurotypical listeners' experience while listening to a speaker with nonfluent aphasia?

Distracted/Engaged

To answer this question, we analyzed the results from the slider questions regarding listener engagement, patience, and ease of listening. A significant effect was found for self-disclosure, $p < 0.001$, where participants were observed to rate themselves as more engaged while listening if they heard the aphasia self-disclosure statement as compared to the weather script. Overall, this was a large effect (Cohen's d = 0.88). There was a small effect of self-disclosure (Cohen's d = 0.31) found for engagement in the Speaker 1 condition and a large effect for the Speaker 2 condition (Cohen's d = 1.55).

Impatient/Patient

A significant effect was found for self-disclosure, $p < 0.001$. Participants who heard the aphasia self-disclosure script were more likely to perceive themselves as more patient while listening as compared to participants who heard the weather script. This was a large effect overall (Cohen's d = 1.19). A medium effect of self-disclosure (Cohen's d = 0.74) was found for patience in the Speaker 1 condition and a large effect for the Speaker 2 condition (Cohen's d = 1.75).

Uncomfortable/Comfortable

A significant effect was found for self-disclosure, $p < 0.001$, where participants who listened to the aphasia self-disclosure script rated themselves as more comfortable while listening as compared to participants who listened to the weather script. This was a

small effect overall (Cohen's d = 0.46). There was a large effect of self-disclosure found for participants who listened to Speaker 2 (Cohen's d = 0.94). The effect size of self-disclosure on listener comfort for participants who listened to Speaker 1 was negligible (0.02).

Hard/Easy

There was a significant effect found for self-disclosure, p = 0.002. Participants who heard the aphasia self-disclosure script reported that it was easier to listen to the speaker with aphasia as compared to the participants who heard the weather script. This was a small effect overall (Cohen's d = 0.40). There was a large effect of self-disclosure found for ease of listening by participants who listened to Speaker 2 (Cohen's d = 0.80). The effect size of self-disclosure for ease of listening by participants who listened to Speaker 1 was negligible (0.04).

	Advocacy Mean(SD)	**Weather Mean(SD)**	**p-value**	**Cohen's d**
Unintelligent/intelligent	79.5(19.9)	48.5(22.5)	<.001	1.46
Unfriendly/friendly	82.2(17.6)	72.7(18.6)	<.001	0.52
Unkind/kind	79.5(18.2)	71.4(18.5)	<.001	0.44
Unsure/confident	66.8(24.3)	46.8(26.2)	<.001	0.79
Distracted/engaged	79.3(22.0)	57.1(28.2)	<.001	0.88
Impatient/patient	74.1(27.4)	38.7(31.9)	<.001	1.19
Uncomfortable/comfortable	59.8(28.8)	47.0(26.6)	<.001	0.46
Hard/easy	51.2(32.8)	39.0(28.6)	0.001	0.40

Table 3: Results collapsed across the two speakers. Means for each script indicate the average rating for each attribute (from 0-100) on the rating scale.

	Speaker 1 Advocacy Mean(SD)	Speaker 1 Weather Mean(SD)	Speaker 1 Cohen's d	Speaker 2 Advocacy Mean(SD)	Speaker 2 Weather Mean(SD)	Speaker 2 Cohen's d
Unintelligent / intelligent	74.26(22.16)	53.97(23.18)	0.90	84.47(16.22)	43.05(20.54)	2.24
Unfriendly / friendly	81.98(17.45)	79.80(16.44)	0.13	82.32(17.97)	65.62(18.04)	0.93
Unkind / kind	80.07(17.52)	76.07(19.24)	0.22	78.90(18.92)	66.81(16.72)	0.68
Unsure / confident	63.35(24.82)	57.62(26.57)	0.22	70.13(23.62)	36.06(20.98)	1.53
Distracted / engaged	73.68(23.32)	66.00(28.86)	0.31	84.71(19.45)	48.28(26.96)	1.55
Impatient / patient	71.67(27.00)	49.67(32.40)	0.74	76.33(27.87)	27.75(27.54)	1.75
Uncomfortable / comfortable	52.23(26.17)	52.75(27.30)	0.02	66.95(29.56)	41.28(24.89)	0.94
Hard / easy	28.98(22.66)	28.01(22.36)	0.04	72.40(26.24)	49.87(29.99)	0.80

Table 4: Results for each condition by speaker. Means for each script indicate the average rating for each attribute (from 0-100) on the rating scale.

CHAPTER 4

CONCLUSION

The purpose of this study was to investigate the attitudes of listeners who heard an aphasia self-disclosure statement from a speaker with nonfluent aphasia, as compared to those of listeners who did not hear a self-disclosure statement. Overall, the participants who heard an aphasia self-disclosure script rated the speakers as significantly more intelligent, friendly, kind, and confident than did the participants who did not hear an aphasia self-disclosure script. In addition, participants who heard the self-disclosure script, rather than the neutral script, rated their own listener experience as more positive in terms of engagement, patience, comfort, and ease of listening.

Of note is that the aphasia self-disclosure script contained specific educational components regarding intelligence and patience ("Aphasia affects my language, not my intelligence…" and "...give me time to communicate."). The results demonstrated that the two largest effect sizes came from the slider questions asking about intelligence and patience ($d = 1.46$ and $d = 1.19$, respectively), and this is consistent across ratings for the two speakers. For intelligence, the average(SD) rating for Speaker 1 in the weather condition was 53.97(23.18), whereas in the self-advocacy condition, the average rating was 74.26(22.16). Similarly, the average(SD) rating of Speaker 2's intelligence in the weather condition was 43.05(20.54); in the self-advocacy condition it was 84.47(16.22). Moving to the patience attribute of listening experience, Speaker 1's average(SD) rating in the weather condition was 49.67(32.40), but was 71.67(27.00) in the self-advocacy condition. Speaker 2's average(SD) patience rating in the weather condition was 27.75(27.54); it was 76.33(27.87) in the self-advocacy condition. These raw differences

in ratings between the two conditions and speakers demonstrate that participants rated the speaker as significantly more intelligent, and rated themselves as significantly more patient, when listening to a speaker delivering a self-advocacy script. Further, since intelligence and patience were directly targeted in the script, a critical takeaway from this study is that the contents of the disclosure script matter. While this is an important finding, the large effect sizes and raw differences in ratings for these two variables do not prove clinical significance. To assess this, further research should measure how communicative behavior is affected by self-disclosure.

For each slider question, the effect of self-disclosure for the male speaker was numerically greater than for the female speaker. For some questions, the difference was quite substantial: for example, the effect of self-disclosure on the perceptions of the male speaker's intelligence was large ($d = 2.24$), compared to the same effect for the female speaker (though also large), $d = 0.90$. We plan to conduct further statistical analyses (i.e., linear regression models) to test for significant interactions between speaker and condition (self-advocacy script vs. weather script).

However, here I offer a preliminary explanation for the finding that self-disclosure had a larger effect on listener ratings for the male speaker. Listener ratings from the weather script reveal differences in how the listeners perceived the two speakers in the absence of self-disclosure. The ratings during the weather condition were lower for the male speaker for every item except for participant ease of listening, where the female speaker had a lower score in the weather condition, indicating that participants found her more difficult to comprehend than the male speaker. The female speaker's apraxia of speech is more severe; she received a sub-score of 13/15 on the ABA-2, versus the male

speaker, whose sub-score was 9/15. It is possible that this drove the effects for the other slider questions. As apraxia of speech is a disorder in which a person has difficulty with planning and coordinating the motoric movements necessary for speech, a more severe case would cause speech production to be harder to understand compared to a less severe case. Therefore, if the female speaker's speech was more difficult to understand, her spoken self-disclosure script may not have had as large of an effect as the male speaker's script because participants struggled to understand its content.

On the other hand, it is possible that, because the female speaker's ratings were higher in every other aspect for both conditions besides ease of listening, perceptions toward her communication had less room to improve with assistance from a self-disclosure script. For example, ratings for engagement during the female speaker's weather condition began at a 66/100, improving to 73.68/100 after self-disclosure. The male speaker's ratings for engagement began at 48.28/100 during the weather condition and improved with self-disclosure to 84.71/100. Participants rated the male speaker lower from the beginning, so it is possible that the self-disclosure script was able to influence perceptions of his communication more than that of the female speaker. Speaker gender could have also driven the differences in ratings. More research with an increased number of speakers should be completed to determine this.

Aside from the rating survey, open-ended data was collected from a single question directly following the given audio file ("Please provide 1-3 comments about what it was like to listen to the speaker") in order to obtain more information about participants' thought processes while completing the experiment. Further analyses of these responses will lend insight into participants' reasoning behind their ratings, which

could aid in understanding the effects found in the rating scale, as well as demonstrate attitudes that might exist in an in-person scenario.

Limitations

Because this study was executed remotely, there were limitations that must be addressed. The most critical limitation to mention is that participants could not be supervised while completing the experiment. In addition, experimenters were unable to create a fixed playback speed for the audio files or limit the number of times participants played the files. Therefore, participants had the ability to alter the playback speed, listen to the audio faster than it was intended to be presented, or listen to the audio files an uncontrolled number of times. Participants having the ability to play the audio files at a different speed or more than once alters the experience of listening to the speaker. Faster playback of the audio files would mean a participant is not experiencing the pauses, word-finding difficulties, and apraxia of speech at the same intensity as a participant who did not change the playback speed. Additionally, during a true interaction between a person with aphasia and an unfamiliar communication partner, the person with aphasia would likely not repeat themselves verbatim as many times as the communication partner desired.

Future Directions

Immediate future directions include extended analysis of the data obtained within this study (e.g., open-ended question analysis, linear models on numerical data, etc.). However, as the results from this experiment demonstrated that script content matters in ratings of PWA, further research should also be done investigating attitude differences

based on script content and modality in order to maximize the effectiveness of aphasia self-disclosure scripting and/or aphasia identification cards.

As this study examined listener perceptions and did not involve interaction with participants with aphasia, it is impossible to know if participants would have responded similarly during an in-person interaction with a person who had aphasia. There are factors that cause an in-person interaction to differ greatly from an online or virtual interaction (e.g., time and social pressure), and these have the potential to influence behavior. A step toward examining an in-person interaction would come from conducting a study in which participants are guided to envision a realistic interaction with a PWA. For example, participants could envision being on an airplane, then hear a self-disclosure script or a neutral script from the "passenger" next to them. Then, they could make conversational decisions (e.g., whether they would communicate with the PWA to request something, to talk about safety, etc.). We have developed this experiment and intend to complete it in the future.

Results from the present study demonstrate that it is feasible to shift attitudes during a remote experience of listening to a brief self-disclosure script produced by a speaker with aphasia. This evidence converges with three CPT studies reported in Tessier et al. (2020) that were delivered at least partly online. This becomes clinically relevant when contemplating the accessibility of remote training for people to learn about and gain experience with aphasia. At the same time, the ability to shift attitudes through virtual programming could assist in the effective implementation of a social media-based aphasia awareness campaign. Though CPT is an ideal way for someone to become educated about aphasia and learn how to facilitate communication with someone who has

it, not everyone personally knows a person with aphasia or has the ability to complete formal CPT. If remote delivery were to be utilized, its implementation could be more widespread across individuals and organizations. Further research should be conducted to determine the efficacy of remote aphasia awareness programs as well as campaigns.

REFERENCES

Brown, K., McGahan, L., Alkhaledi, M., Seah, D., Howe, T., & Worrall, L. (2006). Environmental factors that influence community participation of adults with aphasia: The perspective of service industry workers. *Aphasiology, 20*(7), 595-615.

Byrd, C. T., Croft, R., Gkalitsiou, Z., & Hampton, E. (2017). Clinical utility of self-disclosure for adults who stutter: Apologetic versus informative statements. *Journal of Fluency Disorders, 54*, 1-13.

Byrd, C. T., McGill, M., Gkalitsiou, Z., & Cappellini, C. (2017). The effects of self-disclosure on male and female perceptions of individuals who stutter. *American Journal of Speech-Language Pathology, 26*(1), 69-80.

Code, C., Simmons Mackie, N., Armstrong, E., Stiegler, L., Armstrong, J. and Bushby, E. (2001). The public awareness of aphasia: An international survey. *International Journal of Language and Communication Disorders, 36*, 1-5.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. New York, NY: Routledge Academic.

Collier, B., Blackstone, S.W., & Taylor, A. (2012). Communication access to businesses and organizations for people with complex communication needs. *Augmentative and Alternative Communication, 28*(4), 205-218.

Duffy, J. R., Boyle, M., & Plattner, L. (1980). *Listener reactions to personal characteristics of fluent and nonfluent aphasic speakers.* Paper presented at the Clinical Aphasiology Conference, Bar Harbor, ME.

Eadie, T. L., Rajabzadeh, R., Isetti, D. D., Nevdahl, M. T., & Baylor, C. R. (2017). The

effect of information and severity on perception of speakers with adductor spasmodic dysphonia. *American Journal of Speech-Language Pathology, 26*(2), 327-341.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191.

Fridriksson, J., Hubbard, H.I., Hudspeth, S.G., Holland, A.L., Bonilha, L., Fromm, D., & Rorden, C. (2012). Speech entrainment enables patients with Broca's aphasia to produce fluent speech. *Brain, 135 (12)*, 3815-2829.

Funke, F., & Reips, U. D. (2012). Why semantic differentials in web-based research should be made from visual analogue scales and not from 5-point scales. *Field methods, 24*(3), 310-327.

Harmon, T. G. (2020). Everyday communication challenges in aphasia: Descriptions of experiences and coping strategies. *Aphasiology, 34*(10), 1270-1290.

Harmon, T. G., Jacks, A., Haley, K. L., & Faldowski, R. A. (2016). Listener perceptions of simulated fluent speech in nonfluent aphasia. *Aphasiology, 30*(8), 922-942.

Healey, E. C., Gabel, R. M., Daniels, D. E., & Kawai, N. (2007). The effects of self-disclosure and non self-disclosure of stuttering on listeners' perceptions of a person who stutters. *Journal of Fluency Disorders, 32*(1), 51-69.

Helfer, K. S., Chevalier, J., & Freyman, R. L. (2010). Aging, spatial cues, and single-versus dual-task performance in competing speech perception. *The Journal of the Acoustical Society of America, 128*(6), 3625-3633.

Helfer, K. S., Merchant, G. R., & Wasiuk, P. A. (2017). Age-related changes in objective

and subjective speech perception in complex listening environments. *Journal of Speech, Language, and Hearing Research*, *60*(10), 3009-3018.

Hill, A., Blevins, R., & Code, C. (2019). Revisiting the public awareness of aphasia in Exeter: 16 years on. *International Journal of Speech-Language Pathology, 21* (5), 504-512.

Howe, T. J., Worrall, L. E., & Hickson, L. M. H. (2008). Interviews with people with aphasia: Environmental factors that influence their community participation. *Aphasiology*, *22*(10), 1092-1120.

Isetti, D. (2020). Disclosure of a communication disorder during a job interview: A theoretical model. *Journal of Communication Disorders, 87,* 106038.

Kagan, A., Black, S. E., Felson Duchan, J., Simmons-Mackie, N., & Square, P. (2001). Training volunteers as conversation partners using "Supported Conversation for Adults with Aphasia" (SCA): A controlled trial. *Journal of Speech, Language, and Hearing Research, 44,* 624-638.

Kertesz, A. (2007). Western Aphasia Battery--Revised.

Khvalabov, N. (2019). *Listener judgments of fluency and perceptions of aphasia.* (Undergraduate thesis), University of Iowa.

Lallh, A. K., & Rochet, A. P. (2000). The effect of information on listeners' attitudes toward speakers with voice or resonance disorders. *Journal of Speech, Language, and Hearing Research, 43*(3), 782-795.

Le Dorze, G., Salois-Bellerose, É., Alepins, M., Croteau, C., & Hallé, M. C. (2014). A

description of the personal and environmental determinants of participation several years post-stroke according to the views of people who have aphasia. *Aphasiology*, *28*(4), 421-439.

MacWhinney, B., Fromm, D., Forbes, M. & Holland, A. (2011). AphasiaBank: Methods for studying discourse. *Aphasiology, 25*, 1286-1307.

National Aphasia Association. (2020). Aphasia awareness survey. Retrieved from https://www.aphasia.org/2020-aphasia-awareness-survey/

National Aphasia Association (n.d.). Aphasia Statistics. Retrieved from https://www.aphasia.org/aphasia-resources/aphasia-statistics/

Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology, 70*, 153-163.

Simmons-Mackie, N. (2018). *Aphasia in North America: A comprehensive report on incidence, causes, and impact*. Moorestown, NJ: Aphasia Access.

Simmons-Mackie, N., Raymer, A., Armstrong, E., Holland, A., & Cherney, L. R. (2010). Communication partner training in aphasia: A systematic review. *Archives of Physical Medicine and Rehabilitation*, *91*(12), 1814-1837.

Simmons-Mackie, N., Raymer, A., & Cherney, L. R. (2016). Communication partner training in aphasia: An updated systematic review. *Archives of Physical Medicine and Rehabilitation*, *97*(12), 2202-2221.

Simmons-Mackie, N., Worrall, L., Shiggins, C., Isaksen, J., McMenamin, R., Rose, T., Guo, Y. E., & Wallace, S. J. (2020). Beyond the statistics: A research agenda in aphasia awareness. *Aphasiology*, *34*(4), 458-471.

Tessier, A., Power, E., & Croteau, C. (2020). Paid worker and unfamiliar partner communication training: A scoping review. *Journal of Communication Disorders, 83*, 105951.

Wallace, S. J., Worrall, L., Rose, T., Le Dorze, G., Cruice, M., Isaksen, J., Kong, A. P., Simmons-Mackie, N. Scarinci, N., & Gauvreau, C. A. (2017). Which outcomes are most important to people with aphasia and their families? An international nominal group technique study framed within the ICF. *Disability and Rehabilitation, 39*(14), 1364-1379.

Worrall, L., Sherratt, S., Rogers, P., Howe, T., Hersh, D., & Ferguson, A. (2011). What people with aphasia want: Their goals according to the ICF. *Aphasiology, 25*(3), 309-322.