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UNIVERSITY OF NORTHERN COLORADO  
Greeley, Colorado  
The Graduate School

THE EFFICACY OF “CHAT SHEETS” AS A CONVERSATION TOOL  
FOR COMMUNICATIVE ACCESS IN APHASIA:  
A SINGLE-SUBJECT STUDY

A Thesis Submitted in Partial Fulfillment of the  
Requirements for the Degree of  
Master of Arts

Shyanne N. Heise

College of Natural and Health Sciences  
School of Human Sciences  
Audiology and Speech-Language Sciences

August 2019

This Thesis by: Shyanne N. Heise

Entitled: *The Efficacy of “Chat Sheets” as a Conversation Tool for Communicative Access in Aphasia: A Single-Subject Study*

has been approved as meeting the requirements for the Degree of Master of Arts in the College of Natural and Health Sciences, School of Human Sciences, Program of Audiology and Speech-Language Sciences.

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## ABSTRACT

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Adults with aphasia are frequently denied communicative access in family events, discussions, and daily decision-making. Consequently, recent studies have investigated conversational language interventions for individuals with aphasia (IWA) and their families. Aphasiologists support the use of communication partner (CP) training as an intervention method—through which, people around the IWA learn to use strategies and resources to facilitate successful, interactive communication. While CP training alone can be effective, family members of an IWA may benefit from the use of a supplemental conversation tool to bridge the gap between strategy training and implementation.

The purpose of this single-subject A<sub>1</sub>-B-A<sub>2</sub> study was to investigate the efficacy of “Chat Sheets” as a visual tool for facilitating multi-modal communication and improved dyadic comprehension. One dyad (an IWA and his spouse) participated in the study. An initial CP training session was provided for the spouse focusing on Supportive Conversation for Adults with Aphasia (SCA) strategies (Kagan, 1999)—after which the dyad engaged in 10 video-recorded conversations throughout baseline, experimental, and final baseline probes. All conversations were scored by blind raters and an informal interview was conducted at the end of the study.

Quantitative results indicated that Chat Sheets were “highly effective” for promoting multi-modal utterances as compared to baseline (PND = 100%); however, their effect was “questionable” following withdrawal (PND = 66.7%). Slope estimation revealed an accelerating trend upon introduction of Chat Sheets, which continued throughout the final baseline phase. The change in level from the baseline condition to the experimental condition was determined therapeutic; conversely, after Chat Sheets were withdrawn, a contratherapeutic change in level was observed. Qualitative data from a post-study interview added that Chat Sheets improved the dyad’s comprehension and increased the IWA’s participation and sense of inclusion in conversation.

Collectively, these findings may have implications for speech-language pathologist (SLP) service delivery. Chat Sheets are a potentially efficacious therapy tool for increasing multi-modal communication, comprehension, and social participation for an IWA and his or her trained family member(s)—outcomes which align with the goals of adults with aphasia and the World Health Organization’s (2001) framework for rehabilitative health. Additionally, this study provides preliminary evidence for carry-over of target outcomes following the withdrawal of Chat Sheets—alluding to generalization of therapeutic strategies post-intervention.

## **DEDICATION AND ACKNOWLEDGEMENTS**

This work is dedicated to my husband, whose hands worked twice as hard to free mine up for this project. Thank you for your endless love and support.

I would like to express my deepest appreciation to Dr. Miranda Babiak and Dr. Kim Murza—both of whom ignited my interest in clinical research and exceeded all expectations as committee members. I hope to pursue a professional life that pays forward the wisdom and encouragement you have given me.

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# **CHAPTER I**

## **INTRODUCTION**

### **Introduction**

Aphasia is defined as an acquired language disorder resulting from a focal brain lesion in the language-dominant hemisphere, which affects a person's communicative and social functioning, quality of life, and the quality of life of his or her family members (Papathanasiou & Coppens, 2017). According to the National Institute on Deafness and Other Communication Disorders (NIDCD), aphasia often occurs suddenly following a stroke or head injury; however, it may gradually develop along with a brain tumor or progressive neurological disease (2015). A stroke, or cerebrovascular accident, happens when part of the brain's blood supply is impeded—resulting in aphasia when one or more of the language centers of the brain are impacted (National Aphasia Association [NAA], 2016; NIDCD, 2015). Recently, the National Aphasia Association reported that about 750,000 Americans have a stroke each year, and consequently, more than 2,000,000 U.S. citizens are now living with aphasia (2017).

### **Aphasia Screening**

Upon treatment of an individual's brain injury, a physician may be the first professional to recognize the presence of aphasia. Objective information provided through magnetic resonance imaging (MRI) or a computed tomography (CT) scan can indicate aphasia by confirming locations of cerebral injury (Damasio, 1991). Informal

assessments may also be used to identify the disorder by taxing the language centers in the brain. Language tasks that are particularly helpful in identifying such deficits include: repeating words, following commands, answering questions verbally or non-verbally, naming objects, and carrying on a conversation (Papathanasiou & Coppens, 2017). If a patient experiences difficulty with these types of tasks, the physician may refer them to see a speech-language pathologist (SLP) for further testing (NIDCD, 2015).

### **Aphasia Classification**

It is the role of the SLP to formally and extensively evaluate the communication skills of an individual with aphasia. Linguistically, aphasia may impair an individual's overall ability to produce language, comprehend language, or both simultaneously (Beukelman, Fager, Ball, & Dietz, 2007; Papathanasiou & Coppens, 2017). Within the field of aphasiology, the term *language* encompasses a broad range of skills including speaking, listening, reading, writing, gesturing, and using numbers (NAA, 2016). It is important to note that language ability, in itself, is entirely separate from intelligence. The intelligence of an individual who solely has aphasia remains preserved (NAA, 2016).

Although underlying language-based deficits always exist for individuals with aphasia, specific language characteristics vary immensely from patient to patient. Thus, aphasiologists proposed a classification system for aphasia types based on a localizationist approach. On this premise, two distinct categories of aphasia are broadly recognized: (a) fluent aphasia, and (b) non-fluent aphasia. Within each category, several aphasia subtypes exist pertaining to the anatomical site of the individual's brain injury, their linguistic difficulties and strengths, and the severity of their symptoms (NAA, 2016; Papathanasiou & Coppens, 2017).

Consistent with this view, patients who exhibit non-fluent aphasia typically produce sparse language that can be described as perseverative, short utterances with disturbed prosody, syntax, and articulation (Papathanasiou & Coppens, 2017). Contrarily, patients who exhibit fluent aphasia typically produce long bouts of language with few pauses, normal prosody and articulation, and generally in-tact syntax—nevertheless, their language abilities are greatly impaired because their utterances frequently lack content (Papathanasiou & Coppens, 2017).

### **Barriers to Participation**

Characteristics of any aphasia type can mask the competence usually revealed by an individual in conversation (Kagan, 1995). Several affected individuals have reported that aphasia hinders their ability to engage in conversation and reveal what they think, feel, or know (Kagan, 1999). Often, the masking of an individual's competence leads their friends, family members, health care professionals, and others to perceive them as incompetent despite their preserved intelligence and in-tact cognitive abilities (Kagan, 1995; Parr, Byng, Gilpin, & Ireland, 1997). Adults with aphasia have reported that they are frequently denied communicative access in situations such as participating in family events, discussions, and daily decision-making (Cruise, Worrall, Hickson, & Murison, 2003; Howe, Worrall, & Hickson, 2008; Parr et al., 1997).

### **Treatment Considerations**

In the acute and subacute phases of cerebral damage, the brain undergoes substantial recovery processes (NIDCD, 2015). As a result, people with aphasia tend to experience dramatic improvements in their communication abilities within the months post-injury, despite never receiving speech-language therapy (NIDCD, 2015). However,

aphasia often persists as a chronic impairment. In these instances, speech-language intervention can help individuals with aphasia and their family members to compensate with new communication methods and techniques.

Traditionally, speech-language intervention for patients with aphasia focused on restoration of functional communication by attempting to reduce the language impairment (Simmons-Mackie & Damico, 1995). These forms of intervention capitalize on a patient's natural recovery process following a medical event and may be most effective in cases of mild language impairment. However, individuals with severe aphasia often do not recover sufficient language capability to become functional communicators without compensatory support, even after intensive intervention (Beukelman et al., 2007).

In response, the field of aphasiology evolved from a decidedly linguistic orientation, emphasizing “correct” language form and content, to a functional orientation, accounting for both the pragmatic and linguistic aspects of communication (Holland, 1975; Simmons-Mackie & Damico, 1995). Compensatory strategies such as gestures, pictographs, written support, drawing, letter boards, and alternative and augmentative communication (AAC) devices (e.g., electronic devices or apps) are now frequently employed to help an individual with aphasia receive and express ideas within a speech-language therapy setting (Beukelman et al., 2007; Papathanasiou & Coppens, 2017; Simmons-Mackie, 2018). The ultimate goal of using compensatory strategies is to aid an individual in conveying messages through any means necessary. Unlike verbal language alone, *communication* is multi-modal—allowing compensatory strategies to augment language deficits.

## **Communication Accommodation Theory**

Unfortunately, people with aphasia do not always generalize the aforementioned strategies into natural conversation (Beukelman et al., 2007; Lyon et al., 1997; Simmons-Mackie & Damico, 1995). Simmons-Mackie (2018) suggested that the Communication Accommodation Theory (previously the Speech Accommodation Theory) may explain the failure of a person with aphasia to use helpful, augmentative communication strategies during some conversations. This theory details that participants in conversation adjust their talk depending on their conversation partners, regardless of whether the adaptations are beneficial. For individuals with aphasia, the theory alludes to a social drive for affiliation and acceptance by others, causing them to abandon compensatory strategies and unusual communication modes to “accommodate,” or conform to the speaking style of their conversation partner (Simmons-Mackie, 2018).

Since unimpaired conversation partners chiefly rely on verbal speech in conversation, people with aphasia forgo the use of their functional communication supports to match their partner’s modality (Simmons-Mackie, 2018). Granted, this decision is not an efficient one, causing communication breakdowns and strained conversation. If speech-language therapy practices are to be generalized into other settings, intervention must take more of an environmental approach—training those around the person with aphasia to use supplementary communication methods to send and receive comprehensible messages (Kagan, 1995; Kagan, 1998; Lyon et al., 1997). When a communication partner consciously initiates the use of communication supports (e.g., pictographs, drawings, written support, slower speech rate), the person with aphasia demonstrates greater willingness to also use these strategies (Simmons-Mackie, 1998).



## **Communication Partner Training**

Communication partner training is one remedy for unproductive communication accommodation. Communication partners include all people with whom a person with aphasia might interact, whether familiar or unfamiliar.

Ultimately, communication partner training is a form of environmental intervention that involves training people other than, or in addition to, the person with aphasia. This approach differs from traditional augmentative methods, in which the person with aphasia is responsible for initiating the use of multi-modal conversational supports. Instead, communication partners shoulder the responsibility of initiating and using unconventional conversation methods to co-construct messages, such as gestures and pictographs (Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001). Various studies have examined the efficacy of training family members, caregivers, friends, health care providers, or volunteers to better support individuals with aphasia in conversation. In general, findings suggest that communication partner training can improve the functional communication, participation, and overall well-being of those impacted by aphasia (e.g., Cunningham & Ward, 2003; Eriksson, Forsgren, Hartelius, & Saldert, 2016; Hickey, Bourgeois, & Olswang, 2004; Jensen et al., 2015; Kagan, 1999; Kagan et al., 2001; Legg, Young, & Bryer, 2005; Lyon et al., 1997; Simmons-Mackie, Raymer, & Cherney, 2016; Simmons-Mackie, Raymer, Armstrong, Holland, & Cherney, 2010; Wilkinson, Bryan, Lock, & Sage, 2010). Nonetheless, ongoing research is needed to develop effective training tools to help frequent communication partners understand and use supportive, multi-modal conversation strategies.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **Functional Communication in Aphasiology**

The current climate of aphasiology was shaped by the realization that people with aphasia can “communicate” better than they can “talk” (Holland, 1975; Holland, 1982; Holland, Fromm, DeRuyter, & Stein, 1996). With this in mind, speech-language pathologists (SLPs) began to prioritize the notion of “functional communication” rather than “linguistic accuracy” (Holland, 1982; Simmons-Mackie & Damico, 1995). This movement catalyzed new investigation of functional performance of people with aphasia in everyday tasks and situations (Armstrong & Ferguson, 2010).

Soon after, the World Health Organization (WHO) Classification of Impairments, Activities, and Participation reflected a similar shift in health care approaches to intervention (2001). The WHO International Classification of Functioning, Disability and Health (ICF) provided a framework for the description of health-related states, particularly useful for intervention research (WHO, 2002). The WHO-ICF accounts for both impairment-based interventions, which attempt to reduce limitations in functioning by remediating intrinsic functions or structures of the body, and other more holistic rehabilitative interventions that increase capacity levels (2001). The latter option may aim to improve an individual’s functioning and participation by modifying influential factors around them—namely, altering the environment by either eliminating environmental

barriers or creating environmental facilitators for improved experiences of daily living (WHO, 2002). From this, the concept of living successfully with aphasia has replaced the previous “deficit” models of language intervention—now, encouraging a focus on positive outcomes and the promotion of participation in life activities (Brown, Worrall, Davidson, & Howe, 2012; Cruice et al., 2003; WHO, 2002).

### **Communicative Success**

These changes advanced when aphasiologists began to define rehabilitative success as the ability of an individual with aphasia to get ideas across using any means necessary (Simmons-Mackie & Damico, 1995). Especially in cases of severe aphasia, the use of compensatory supports or strategies are widely necessary for functional communication (Beukelman et al., 2007). Regardless of how unconventional a conversation may seem, communicative success can be achieved when both partners follow and contribute to conversation, as well as navigate communication breakdowns that arise (Simmons-Mackie & Damico, 1995).

### **Elements of Communication**

Certainly, communication is socially driven and multi-faceted. SLPs have acknowledged that exchanging information is only one function of communication; perhaps even more importantly, communication fosters and promotes personal relationships (Armstrong & Ferguson, 2010; Simmons-Mackie & Damico, 1995). With the advent of this social perspective, the definition of communicative success for an individual with aphasia was enhanced—including an *interactional* function, which serves to establish and maintain social relationships, along with a *transactional* function, which serves to exchange information and share ideas (Brown & Yule, 1983; Kagan et al.,

2004). Communicative success may require the use of verbal and non-verbal communication to achieve both transactional and interactional functions (Beckley, Best, & Beeke, 2017). For example, a person with aphasia and their communication partner may employ the use of verbal speech, gestures, drawings, circumlocution, keywords, signing, pantomiming, and high or low-tech alternative and augmentative aids to achieve a balanced and successful encounter (Beckley et al., 2017; Beukelman et al., 2007; Simmons-Mackie & Damico, 1995).

### **Social Participation**

Evidence exists to support that social participation is one of the primary desires and goals of patients with aphasia (Brown et al., 2012; Worrall et al., 2011). In response, current practices transcend the traditional focus of impairment-based therapy to optimize goals of social participation (Kagan et al., 2001; Simmons-Mackie & Damico, 1995; Simmons-Mackie et al., 2010). Numerous assessment tools, analysis methods, and treatment protocols have now been developed to directly address an individual's communication abilities through practical and social participation models (e.g., Lyon et al., 1997; Kagan, 1998; Kagan et al., 2001; Kagan et al., 2004); however, despite this movement, specific intervention tools have yet to be designed or disseminated to improve access to social conversations, and the goals of SLPs and clients with aphasia are not always aligned (Worrall et al., 2011).

Ideally, in order to guide service delivery, individuals with aphasia should help set their own intervention goals. For insight into the most agreed upon goals of people with aphasia, Worrall and colleagues (2011) performed a qualitative, descriptive study. After completing 50 interviews with stroke survivors with aphasia, the authors identified nine

categories of goals, including: return to pre-stroke life; ability to communicate opinions (not just basic needs); becoming informed about aphasia, stroke, and resources; attending more speech-language therapy; greater autonomy; being treated with dignity and respect; engagement in social, leisure, and work activities; regaining physical health; and taking opportunities to help others (Worrall et al., 2011). Remarkably, the goals spanned every component within the WHO-ICF (environmental factors, personal factors, and body functions and structures), although they focused mainly on the activity and participation components of the model.

Additionally, Brown and colleagues (2012) conducted a qualitative meta-analysis of three of their previous studies to examine overarching themes regarding the perspectives of individuals with aphasia, family members, and SLPs on living successfully with aphasia. Using “meta-ethnography,” the authors completed an inductive analysis, in which the data from each study were re-analyzed to identify perspective themes across participants. Seven themes were universally identified, including: participation, meaningful relationships, support, communication, positivity, autonomy, and embracing the journey. The most emphasized perspective from individuals with aphasia, family members, and SLPs was that participation in meaningful activities is essential to living successfully with aphasia. Collectively, continued participation in hobbies was most highly mentioned, followed by activities centered around the home, travel, work, volunteering, and occupational training or development (Brown et al., 2012). These findings emphasize the need for an individualized intervention approach that considers communication in the context of a client’s social network and daily activities.

### **Communication Partner Training**

The cornerstone of social participation and interaction is conversation (Kagan et al., 2004; Lyon et al., 1997; Togher, Power, Tate, McDonald, & Rietdijk, 2010). With this, it is important to note that in any conversation, an individual with aphasia represents only one side of the interaction. The behavior of a conversational partner is paramount—either facilitating or diminishing opportunities for the person with aphasia to successfully continue the conversation (Simmons-Mackie, 2018; Togher et al., 2010). Thus, it is important to treat and assess aspects of communication on a global level by accounting for more than the sole abilities of the individual with a language impairment (Kagan et al., 2004).

Providing intervention for those who communicate with people with aphasia, often termed “communication partner training,” has recently been the focus of several approaches within aphasiology and appears to be growing as an area of speech-language intervention (Saldert, Johansson, & Wilkinson, 2015; Simmons-Mackie et al., 2016). Early ideas of communication partner training refuted the standard impairment-based approach in favor of a more holistic intervention that focused on communication as a collaborative achievement between participants. As suggested by existing research, the behaviors involved in conversation are, by definition, functionally interdependent (e.g., providing contingent responses, establishing shared context, participating in turn-taking, establishing and maintaining a topic, etc.) (Holland, 1998).

In a review study by Simmons-Mackie and colleagues (2010), the level of research evidence supporting a communication partner training approach was evaluated through the appraisal of 31 relevant treatment articles. Each of the articles included in the

review reported positive outcomes from increasing the conversation skills of a partner. The authors suggested that this approach was recommended for those with chronic aphasia. Moreover, the sole effect of counseling or educational based intervention models did not demonstrate sufficient evidence to be recommended in the research, indicating that explicit partner training is warranted for this population (Simmons-Mackie et al., 2010).

Years later, an updated systematic review was completed by Simmons-Mackie and colleagues (2016) to consider more recent studies involving communication partner training in aphasia rehabilitation. The authors reviewed an additional 25 articles using design-specific tools to assess quality. Between both systematic reviews by Simmons-Mackie and colleagues, a total of 56 studies regarding communication partner training in aphasia were reviewed (2010, 2016). With no exception, all of these studies reported positive effects. Hence, the authors remain proponents of a communication partner training model and recommend continued intervention to address partner skill in facilitating conversation for individuals with chronic aphasia.

### **Classification of Approaches**

Several methods of communication partner training have been employed over the past few decades. Each approach differs in the familiarity of the conversation partner, the type of training provided, the context of the intervention, the tools used for training and practice, the variables of interest, and the outcome analysis methods (Simmons-Mackie, Savage, & Worrall, 2014). Despite clear differences in methodology, each approach systematically demonstrates that environmental intervention may benefit those with aphasia. Central to every compelling aphasia partner training approach in the literature is

the promotion of internal well-being and involvement in a broad range of activities, personal decisions, and social networks (e.g., Cunningham & Ward, 2003; Hickey et al., 2004; Kagan et al., 2001; Legg et al., 2005; Lyon et al., 1997; Saldert et al., 2015; Simmons-Mackie, Kearns, & Potechin, 2005).

Considering the diverse nature of training approaches, treatment implementation, targeted outcomes, and methods of measuring outcomes, a recent Cochrane review called for greater consensus on the selection of outcome methods in aphasia research (i.e., Brady, Kelly, Godwin, Enderby, & Campbell, 2016). Despite the large variety of approaches and targeted outcomes, Saldert, Jensen, Johansson, and Simmons-Mackie (2018) offered a narrowed scope by suggesting two classifications of communication partner training—generic approaches and dyad-focused approaches. Each approach tends to have separate training objectives, intervention tasks, and thus, significantly different measured outcomes (Saldert et al., 2018).

In generic approaches, training is aimed at the communication partner alone. Consequently, generic trainings are not considered individualized—instead, they are intended for broad application, with a key component being that healthcare staff can undergo generic training to speak with many individuals with different types of aphasia.. The goal of this approach is to increase the conversation partner’s knowledge of aphasia, and thereby, increase their use of supportive techniques and resources in conversation. Along with these goals, a generic approach aims to increase the participation of adults with aphasia, enhance feelings of inclusion for those with aphasia, and lessen the negative feelings and emotions that conversation partners might have about communicating with an adult with aphasia. To teach these strategies, conversation



partners often participate in role-play scenarios to apply strategies with various individuals with aphasia in a health care setting (Saldert et al., 2018).

In dyad-focused approaches, training is aimed at dyads consisting of a person with aphasia and a frequent communication partner (e.g., a spouse or caretaker). A dyad-focused approach is considered a more individualized approach, as the main objective is better communication between the individuals in that specific dyad. This is achieved by teaching the dyad about aphasia, as well as ways to increase facilitative communication behaviors and decrease barriers. Often, these interventions utilize video-recorded interactions between the participants to gain insights and adaptations of trained and untrained communication behaviors. Moreover, the outcomes that are targeted are the communication partner's knowledge of communication in aphasia (especially pertaining to their own facilitative and non-facilitative behaviors in conversation), any positive change in the conversation partner's behaviors, and changes in the dyad's perspectives and emotions surrounding their every-day conversations (Saldert et al., 2018).

### **Generic Approaches**

#### **Volunteers as Partners**

Lyon and colleagues (1992, 1997) suggested that improved communication and participation for adults with aphasia may require broad and extensive interventions. As a treatment model, the authors proposed a program called Communication Partners (CPS) to foster the aim of restoring a sense of purpose, direction, and control within daily life for a person with aphasia. The 3-year CPS program was intended to enhance the communication and well-being of individuals with aphasia in their most natural settings—where they and their caregivers live and interact (Lyon et al., 1997).

The process of CPS began with the participation of a community volunteer, who acted as a bridge between clinical and real-life pursuits. Each volunteer paired with a person with aphasia and his or her caregiver to create a triad. Over the course of the 3-year study, 10 treatment triads were randomly assigned to either a five-and-a-half-month pre-post-treatment protocol, or a no-treatment group.

The CPS treatment consisted of two phases: the first phase was a 6-week period in which triads established a relationship through progressively effective and comfortable interactions; the second phase was a 14-week period during which triads engaged in normal life activities for the individual with aphasia, at home or in the community. Some examples of activities chosen by the individuals with aphasia included gardening, walking dogs at the Humane Society, playing tennis, or taking an art class. Following both phases, results were derived from standardized and non-standardized measures, as well as informal measures of objectives. The standardized measures lacked the sensitivity and specificity to demonstrate treatment gains, but the non-standardized indexes and questionnaires revealed significant pre- to post-treatment gains regarding communication ability and overall well-being of the individual with aphasia (Lyon et al., 1997). These preliminary findings warranted further study regarding intervention methods and outcome analysis in settings where individuals with aphasia live and interact with those around them.

After Lyon and colleagues (1997) suggested the impact of working with individuals in natural settings, studies began to focus on training communication partners within the health care setting. For example, to address the needs of nursing home residents with aphasia, Hickey and colleagues (2004) conducted an A-B-A multiple

baseline study across subjects and partners, including a baseline phase, a volunteer training phase, and a post-training phase. The authors examined the effectiveness of a program to train four university student volunteers (majoring in Communication Science and Disorders) to use multi-modality methods of communication. Specifically, their goal was to increase the total number of comprehensible utterances from two residents with aphasia during conversation with a volunteer. The student volunteers received multi-modality conversation training three times per week from a certified SLP, which included five steps: (1) general education about aphasia; (2) video reviews of trained partners in conversation with individuals with aphasia; (3) student self-evaluation (regarding multi-modality communication) of baseline conversations; (4) practice of multi-modality conversation with on-line feedback; and (5) practice of multi-modality conversation without on-line feedback.

The authors performed sequential analyses of the baseline, training, and post-training conversations and gathered data on social validity. These measures revealed that the student volunteers' multi-modality utterances were consistently more likely to lead to a comprehensible utterance from the resident with aphasia, as compared with speech-only utterances. The effect became greater after training, as comprehensible utterances from the individual with aphasia were less likely to come after a speech-only utterance, and more likely to come after a multi-modality utterance from the student volunteers.

Similar to Lyon and co-authors (1997) and Hickey and colleagues (2004), a generic communication partner training approach by Kagan (1998) demonstrated the utility of training volunteers in conversation methods to help individuals with aphasia access the communicative environment. The approach presented by Kagan (1998), called

Supported Conversation for Adults with Aphasia (SCA), was developed at a community-based aphasia center where volunteers were trained to interact with individuals and family members affected by chronic aphasia (Kagan, 1999). SCA is closely allied and complimentary to Lyon and colleagues' (1997) communication partners approach, in that the overarching goal is increased communicative confidence and participation in life through the trained skillset of volunteer conversation partners (Kagan, 1998).

**Supported Conversation for Adults with Aphasia.** SCA is an evidence-based approach that improves the effectiveness of communication between individuals with aphasia and their conversation partners (Kagan, 1998; Kagan, 1999; Kagan et al., 2001; Simmons-Mackie et al., 2016). The SCA approach is founded on the idea that the inherent competence of people with aphasia can be revealed through the skill of a trained conversation partner (Kagan, 1999).

SCA chiefly focuses on improving conversation outcomes because conversation is the “currency” of social participation (Kagan et al., 2001). By design, SCA emphasizes the outcomes that a conversational dyad (an individual with aphasia and their communication partner) can achieve interdependently, rather than targeting the individual with aphasia's use of communication strategies alone (Kagan, 1998; Kagan et al., 2001; Kagan et al., 2004). Following education and training, a conversation partner must shoulder a significant portion of the communicative load (Kagan, 1998; Simmons-Mackie et al., 2016).

Conversational partner training methods such as SCA encourage speaking partners to initiate the use of compensatory strategies during conversation with an individual who has aphasia (Kagan et al., 2001; Simmons-Mackie, 2018). Within this

structured approach, conversation partners (volunteers) are trained with generic strategies to aid a person with aphasia in conversation. The communication partner must first be educated about aphasia, and then introduced to facilitative strategies for effective communication. Then, the volunteers apply the strategies in an interactive practice setting (e.g., role playing). Specifically, volunteers are taught various ways to acknowledge and reveal the competence of an individual with aphasia prior to speaking with clients (Kagan, 1998; Kagan, 1999). As a result, a trained communication partner may promote communicative access for their partner with aphasia, helping them participate in both transactive and interactive components of conversation (Kagan, 1998; Kagan, 1999).

***Acknowledging competence.*** Within SCA, a conversation partner is trained to use strategies to help a person with aphasia feel respected. A vital component of this strategy is for a volunteer to understand that the person with aphasia is intelligent. Volunteers might demonstrate this knowledge by saying things like, “I know you know what you want to say” in moments of frustration (Kagan, 1998). Other considerations for acknowledging competence include speaking naturally with a normal, adult tone and normal loudness, and explicitly attributing communication breakdowns to a communication partner error rather than indicating the individual with aphasia is at fault (Kagan, 1998). When a volunteer acknowledges the masked competence of a partner with aphasia, they may also help reveal his or her competence through conversation.

***Revealing competence.*** Revealing competence requires a volunteer’s use of techniques to give and receive accurate information. When giving information, a volunteer must ensure that his or her message is clear by eliminating distractions in the environment, speaking in short and simple sentences, using an expressive voice, pairing

verbal information with gestures, keywords, or pictures, and observing the person with aphasia to note any signs of communication breakdown (e.g., confused facial expression) (Kagan, 1998). On the other hand, SCA volunteers are also trained to get accurate information from the speaker with aphasia by ensuring that he or she has a means of responding (e.g., asking “yes or no” questions or fixed choice questions if necessary), asking only one thing at a time, and allowing substantial time for a communication attempt (Kagan, 1998). After a communication attempt has been made by the individual with aphasia, volunteers are also encouraged to recap their understanding of the conversation or verify the information that they received. Thus, it is important that a volunteer slowly and clearly summarizes what the individual with aphasia said to confirm understanding. Through a communication partner’s use of these strategies, an individual with aphasia can reveal competence by demonstrating transactive and interactive components of conversation.

Following the introduction of SCA, a single-blind, randomized, controlled study with pre- and post-test design was conducted to evaluate its practicality for use with volunteers. Kagan and colleagues (2001) were interested in examining if the SCA training evoked changes in the volunteers’ ability to acknowledge and reveal the competence of a person with aphasia, and they were also interested in seeing if those behavioral changes affected the individual with aphasia during conversation. The authors completed the study with 80 conversation partners consisting of 20 SCA-trained volunteers, 20 control volunteers, and 40 individuals with aphasia randomly assigned to a volunteer conversation partner in either the experimental or control group. Thus, a total of 40 dyads were examined.

This study measured conversation during semi-structured interviews, which enabled the authors to compare conversations across dyads as well as within dyads. The format also accounted for the fact that people with aphasia typically engage in this sort of semi-structured conversation with health professionals or volunteers in health-related settings. During the interviews, written and pictographic resources were available for use. After the first interview was conducted between each dyad, experimental volunteers were trained in the SCA approach based on procedures outlined in Kagan (1999). During this one-day workshop, volunteers learned about SCA via four modules (conceptual, technical, interactive role-play, and evaluation exercise modules) which totaled over 5-hours of training. After the one-day workshop, a 1.5-hour practice session was held for the SCA-trained volunteers, supervised by an SLP. Finally, each dyad completed a second semi-structured interview for post-intervention video analysis.

To evaluate the conversations between individuals with aphasia and their assigned volunteers, a set of measures were developed and field-tested by Kagan (1999). These measures, called the “Measure of Skill in Providing Supported Conversation for Adults with Aphasia” (MSCA) and the “Measure of Participation in Conversation for Adults with Aphasia” (MPCA), were implemented to evaluate the changes demonstrated by the dyads. The results suggested that the intervention improved the experimental group volunteers’ ability to both acknowledge and reveal the competence of their partners with aphasia ( $p < 0.001$ ;  $p < 0.001$ ), while the control group did not demonstrate statistically significant change in either ability. Moreover, post-intervention, the social participation ( $p < 0.023$ ) and message exchange skills ( $p < 0.001$ ) of the participants with aphasia improved, even though they were not involved in the training whatsoever. It is likely that

affecting change in a communication partner can greatly impact daily life and social participation of a person with aphasia—although additional research is needed to investigate the utility of generic SCA training for other conversation partners such as caregivers or family members (Kagan et al., 2001).

### **Health Professionals as Partners**

With the advent of a social model of rehabilitation for individuals with aphasia, medical-minded communication interventions were necessitated (Kagan, 1998; Kagan et al., 2001; Parr et al., 1997). Kagan and colleagues (2001) suggested that health care professionals may also benefit from generic conversation partner trainings that introduce ways to facilitate communication via verbal adaptations, non-verbal supplements, and the important technique of verifying the patient's response.

Characteristically, generic approaches allow for medical professionals and support staff to better interact with individuals who are impacted by aphasia (e.g., Eriksson et al., 2016; Jensen et al., 2015; Legg et al., 2005). Communication partner training has been investigated for these populations because individuals with aphasia may experience difficulty accessing information, making decisions, and participating in their own treatment, care, and rehabilitation (O'Halloran, Worrall, & Hickson, 2012). Broadly, the results of recent studies on generic communication partner training for health care professionals suggest a benefit for the general population of adults with aphasia in a health care setting, but they do not target the more individualized social needs of a particular dyad (Eriksson et al., 2016; Jensen et al., 2015; Legg et al., 2005).

Currently, Aura Kagan (1999) develops and sells pictographic booklets for medical professionals (i.e., a book of pictures symbolizing important medical concepts),



yet no structured tools are available to support the use of SCA in social conversations. The tools and trainings for generic approaches also fail to bridge beyond simple, concrete conversations about basic wants or needs (e.g., location of pain, choice of clothing, etc.)—which neglects the overarching goal of increased social participation that people with aphasia, their family members, and SLPs prioritize (Brown et al., 2012; Worrall et al., 2011). Contrarily, dyad-focused approaches involve the person with aphasia in intervention, while tailoring to the particular needs of a familiar conversation partner (e.g., a spouse)—though conversational tools for this purpose are not yet available.

### **Dyad-Focused Approaches**

#### **Spouses as Partners**

The effect of aphasia on family members is a proposed “third-party disability” (WHO, 2001). Relatives of individuals with aphasia are service users in their own right, with distinct intervention needs (Hilton, Leenhouts, Webster, & Morris, 2014). That being said, communication partner training may be an appropriate intervention for family members affected by aphasia, as the strategies provided by an SLP may ease the burden of communication barriers (Hilton et al., 2014).

This possibility was investigated by Cunningham and Ward (2003) through the analysis of conversational interaction using a single-case A-B-A study design. Four dyads were included in the study, each comprised of one person with aphasia and his or her spouse. The principle aim of the study was to investigate an SCA-based training approach for improving conversation between each couple. A stable baseline was established, during which the dyads participated in 15-minute video-recorded conversations about researcher-chosen topics. The topics were suggested to begin conversation, but

participants could change the subject if desired. During all phases of the study, an array of props such as magazines, catalogues, and atlases were available for use during conversation.

During the intervention phase, Cunningham and Ward (2003) carried out five weekly sessions, lasting 1.5 hours each. The first two sessions were mainly informational, the third session included baseline video feedback, and the final two sessions were focused on role-playing conversation scenarios. Following intervention, another 3-week baseline assessment phase was carried out. The resulting data were analyzed via conversation analysis (to identify successful repairs and trouble sources) and frequency counts of non-verbal behaviors (i.e., use of props, gestures, writing, touch, etc.)—both revealing positive trends post-intervention, despite great individual and didactic variation. Visual inspection of the data revealed that the dyads' mean scores for the category 'gesture' increased the most post-intervention. Cunningham and Ward (2003) stressed that future research was needed to specify techniques and tools for communication partner training, establish who will benefit from the approach, and detail the optimal number of training sessions to promote meaningful change.

Later, Simmons-Mackie and colleagues (2005) conducted a single-subject multiple baseline study to examine the effectiveness and generalization of a family member training for an individual with aphasia. Specific behaviors of a spouse were observed in conversation, and the authors attempted to modify her non-facilitative communication behaviors. Following a baseline phase, two treatment targets were identified for modification: spouse interruptions and excessive use of convergent questions. In addition, a third behavior was chosen for monitoring, without treatment, to

examine the training's generalization to an untrained behavior: negative teaching. The study consisted of a baseline condition and a recognition training condition. One-month post-intervention, follow-up probes were completed to determine if training effects were stable over time, or if regression was noted.

Interestingly, the authors reported that recognition training was an effective method in modifying a spouse's non-facilitative conversational behaviors with her husband with aphasia. The authors reported a decrease in the percentage of spouse interruptions and convergent questions, from 40% and 50% at baseline, to 0% and 25% at follow-up, respectively. These results, supported by a post-intervention questionnaire for social validity, suggest meaningful change despite that effect sizes were not reported. The trained spouse's behaviors also consistently generalized across settings (into spontaneous conversation), across behaviors (negative teaching was reduced without being targeted), and indirectly improved the husband with aphasia's expressive language. Thus, Simmons-Mackie and co-authors (2005) suggested that a conversational partner training—namely, recognition training—may be a beneficial and generalizable approach for family-based aphasia intervention.

Likewise, Wilkinson and colleagues (2010) conducted a single-case intervention study to advance interaction-focused treatments in aphasia. Also comparable to Cunningham and Ward (2003), the researchers targeted and administered therapy with a person with aphasia and his wife as a couple—though the conversations in the study by Wilkinson and colleagues were more naturalistic. The researchers developed an intervention based on the couple's restricted conversation style, which seemed to prevent

the speaker with aphasia from revealing his competence or making use of his remaining linguistic abilities.

The training components included in Wilkinson et al.'s (2010) study were individualized according to the spouse's non-facilitative behaviors (i.e., asking too many closed, interrogative, or test questions) as well as the passive behaviors of her husband with aphasia (i.e., contributing mostly one word turns in conversation with no attempt at elaboration). While the authors did not report using any structured training tools, they directly targeted these areas of need through dyadic training—after which, they used qualitative and quantitative measures to examine the outcomes. From pre- to post-intervention, the participant with aphasia produced 18% more turns with at least one sentence (or attempted sentence), and 12% more turns that contained two or more sentences (or attempted sentences). His spouse also demonstrated improved conversation behaviors by decreasing her turns that contained questions by 56%, increasing her turns that did not contain questions by 56%, and responding to some of his turns with a minimal turn (e.g., “mhmm”) or a paraphrase of his turn to confirm understanding. The study provided evidence that an interaction-based intervention, which targeted conversational behaviors of both partners, positively influenced the quality of the conversation (Wilkinson et al., 2010).

More recently, Saldert and co-authors (2015) took an interaction-focused approach to train everyday conversation partners in the absence of their spouses with aphasia. While this methodology mimics that of a generic approach, the authors identified and focused on the particular goals and training needs of each dyad, indicating a more dyad-focused intervention. Five group-based, weekly intervention sessions were led by

an SLP, lasting for 1.5 hours each. The intervention group was comprised of three adults—each of whom had a spouse with aphasia. The aspects of conversation discussed in treatment sessions included: trouble sources and repair, turns and sequences, and topic management. Moreover, the group participants frequently watched and discussed video-recorded examples of common problems and strategies for successful communication when one partner has aphasia, as well as video reviews of their own conversations with their spouses prior to the start of intervention. The participants were not provided with tools to improve communication during video recordings; instead, after conversations were recorded, an SLP provided on-line feedback during video reviews.

For the purposes of this case study, results were only reported for one dyad (a woman with aphasia and her husband). The spouse displayed some positive conversation features, such as supporting his wife's word finding troubles and rewording what she tried to express—however, the authors also noticed that he frequently displayed non-facilitative behaviors such as pedagogic strategies which did not appear to be helpful, displays of distractibility, and finally, rapid turn taking which often moved too quickly to allow his wife a time for a communication attempt. Thus, his individual targets were to reduce pedagogic activities, stay focused on the conversation, and increase his use of minimal response tokens to give his wife with aphasia more time to respond (Saldert et al., 2015).

In order to examine the effectiveness of intervention on these specific behaviors, an SLP visited the dyad to record weekly videos of their normal conversation. The middle 10-minutes of each video was selected and analyzed by the authors for transcription of verbal and non-verbal communication exchanges. A mixed-methods

design was used to include qualitative data from conversation analysis, as well as quantitative data through frequency counts by an independent, blinded assessor. Post-training analysis revealed that the spouse demonstrated positive changes in targeted objectives, including a marked reduction in the duration of pedagogic comments (from 106 seconds to seven seconds;  $p < 0.02$ ) and inattentive behaviors (from six to zero instances) during conversation with his wife with aphasia. Also, he displayed progress in an untrained behavior as well; post-intervention, he did not use any dismissive language, although he occasionally did so prior to the intervention. From these results, Saldert and colleagues (2015) suggested that this method of treatment may be important for dealing with behaviors that are potentially hindering successful communication and effective interactions between an individual with aphasia and his or her significant other.

### **Summary**

Aphasiology has reflected that people with aphasia can communicate better than they can talk (Holland, 1975; Simmons-Mackie & Damico, 1995). Evidence exists to support that social participation is a primary desire of adults with aphasia, so conversation during everyday tasks and situations must be a priority in treatment (Brown et al., 2012; Worrall et al., 2011). This can be addressed through communication partner training approaches, which involve training someone other than, or along with, the person with aphasia to use supportive strategies. Several generic and dyad-focused approaches have been implemented in the literature—each with differing implementation methods and outcomes. However, the research is convergent regarding the positive effect of communication partner training for aphasia intervention with volunteers, health care providers, and family members as training participants (Simmons-Mackie et al., 2016).

### **Statement of the Problem**

Additional research is needed in this budding area of aphasia intervention. While SCA is the most recognized communication partner training method with established training structure, targets, and outcomes, the approach only provides a framework from which partners can be trained in general conversation skills (Kagan, 1999). Thus, the approach does not extend to the full benefit of family members as conversation partners. SCA focuses on general trainings and skills to facilitate successful conversation between a volunteer and anyone who has aphasia, but it does not offer specific tools or contexts to help family members practice the approach with their loved one. According to Kagan and co-authors (2001), a pressing next step in the establishment of SCA is to investigate its implementation as an individualized training approach for family members.

One factor to consider is that conversation topics largely differ in conversation with an unfamiliar volunteer versus a familiar family member. A topic such as “what took place over the weekend” is no longer appropriate for a married couple who experienced the weekend together, and to facilitate more nuanced conversations, an additional tool may be warranted. The development of a conversation tool within communication partner training has yet to be introduced, and preliminary research is needed. Following development, the tool must be proven effective and realistic for use in a clinical setting.

Ultimately, the aim of speech-language therapy should be to help a person with aphasia and his or her most frequent communication partner (typically a spouse) utilize supported conversation on their own in a real-world context. If SCA is only used in a clinic setting, it is hardly in accordance with a social participation model. Functional

conversation tools must be implemented in training sessions to facilitate family conversation, provide supplementary and augmentative support for both partners, and facilitate the generalization of SCA into daily activities—thereby increasing social participation for the person with aphasia.

### **Purpose of the Study**

If communication partner training is to be capitalized on for those with aphasia, specific tools may need to be established for use with family members. One way to accomplish this is through the creation and application of “Chat Sheets,” which suggest a topic of conversation and provide relevant pre-loaded, multi-modal communication means (e.g., pictures, keywords, artifacts, etc.). Topics can extend past concrete wants and needs to be socially relevant for the individual client, and the pre-loaded supports may scaffold a family member’s use of SCA strategies in conversation.

Therefore, the purpose of this study was to examine if the provision of a structured conversational tool—namely, a pre-loaded Chat Sheet—could facilitate the use of multi-modal conversation between an individual with aphasia (IWA) and his trained spouse. The behavior of interest in this study was the dyad’s ability to pair verbal information with visual supports, resulting in a more comprehensible conversation. Following an adapted SCA conversation partner training, the introduction of Chat Sheets may be a facilitative step for the dyad’s application of supported conversation strategies—especially prompting the use of multi-modal communication. The importance of this study is the potential to provide structure to a spouse’s application of newly learned supportive conversation strategies, thereby improving her husband’s social participation and the comprehensibility of the conversation.



### **Research Questions**

The following questions were investigated using a single-subject design:

- Q1     Following an SCA-based communication partner training, does the use of “Chat Sheets” result in a greater frequency of multi-modal utterances in conversation between the IWA and his trained spouse?
- Q2     Following an SCA-based communication partner training, does the use of “Chat Sheets” result in a greater number of comprehensible exchanges between the IWA and his trained spouse in conversation?

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **Introduction**

This chapter describes the research methods used in the implementation of this single-subject experimental design. A reversal design (A<sub>1</sub>-B-A<sub>2</sub> design) was used to identify the efficacy of Chat Sheets in supported conversation between an individual with aphasia and his trained spouse. The study design involved an initial communication partner training session, followed by the establishment of a stable baseline condition (the "A<sub>1</sub>" phase), training and implementation of Chat Sheets as an intervention tool (the "B" phase), and finally, the withdrawal of Chat Sheets to see if the reversal caused a change in outcomes (the "A<sub>2</sub>" phase). Throughout the study, probed outcomes were video recorded and analyzed to assess the frequency and success of multi-modal communication in conversation between an individual with aphasia (IWA) and his spouse as a conversation partner (CP). Thereafter, an informal interview was conducted to obtain data on the social validity of Chat Sheets as a conversational tool for a married couple affected by aphasia.

#### **Informed Consent**

The University of Northern Colorado Institutional Review Board (IRB) granted approval of this study (refer to Appendix A). Furthermore, both participants—the IWA and his spouse—consented to participate in the project. As outlined in Kagan's (1999)

study, the informed consent process for the IWA accounted for his inherent receptive language deficits. The research information was explained to him verbally, while supplemented with pictographic representations and key words (refer to Appendix B). The informed consent process was standard for the CP, during which information about the research project was conveyed through a typical consent form (refer to Appendix C). Both participants signed standard consent forms.

### **Researcher Perspective**

Notably, the primary researcher met the IWA and his wife in April of 2018. At that time, the IWA came in for a speech-language evaluation at the UNC Speech-Language and Audiology clinic (UNC Clinic). The researcher was one of the two graduate clinicians who planned and conducted the IWA's speech-language evaluation. Furthermore, the researcher became the IWA's speech-language graduate clinician and administered treatment sessions for a total of two semesters—which amounted to twenty weekly, 60-minute sessions. The IWA's wife attended and participated in the majority of his sessions. During that time, the use of multi-modal supports and cues were principle elements of therapy, along with clinician modeling of SCA strategies, familial involvement, and a low-tech individualized communication book.

### **Participant Considerations**

#### **Individual with Aphasia**

One IWA, following a traumatic brain injury (TBI) and stroke, was recruited from the UNC Clinic. This individual met the inclusion criteria as follows: (a) a diagnosis of severe receptive aphasia (based on the Aphasia Quotient on the *Western Aphasia Battery* and the clinical judgement of a speech-language pathologist); (b) at least one year post-

injury; (c) without significant hearing loss; (d) medically stable; (e) the ability to engage in conversation at some level with a familiar or skilled conversation partner using verbal, gestural, written, pictured, or drawn modalities as judged by the graduate speech-language clinician at the UNC Clinic; (f) pre-morbidly competent in English as a primary language; and (g) had an English-speaking family member with no language deficits willing to continually partake in a training protocol.

The IWA was a 74-year-old man with a history of left hemisphere TBI and temporo-parietal stroke in August of 2014. Prior to his incidents, he had a high school level of education and he owned his own business providing boiler services. His family members reported that they had no concerns about his speech, language, or cognition prior to the incidents. Although the IWA received speech-language services after his injuries, the family reported that his visits were limited, and it had been at least a year since he received SLP services.

On April 9, 2018, the IWA received a speech-language evaluation at the UNC Clinic. He was accompanied by his wife, daughter, and granddaughter. At that time, the family was aware that he had aphasia, but they were seeking information and resources to help him communicate more effectively. The IWA exhibited significant difficulties with overall comprehension, conveying thoughts, reading, and writing. His ability to grasp the meaning of spoken words was chiefly impaired; he was unable to follow simple directions (e.g., sit down; raise your hand) or identify a common object that the clinician named from a field of two. Expressively, his verbal outputs frequently lacked content—although he commonly exhibited the preservation and appropriate use of some rote

phrases (e.g., how are you?). He was unable to name common objects or repeat single-syllable words, even with visual support and repetitions.

The clinicians administered the *Western Aphasia Battery* (WAB) to determine the type and severity of the IWA's aphasia (Kertesz, 1982). He received an Aphasia Quotient (AQ) of 20.96, placing him in the range of severe aphasia (AQ: 0-25) (Kertesz, 1982). The culmination of his WAB subtest scores (refer to Table 3.1) classified his aphasia type as Wernicke's aphasia (Kertesz, 1982). This aphasia type is named for its common association with damage to Wernicke's area, a region of the brain in the posterior inferior portion of the left temporal lobe (Damasio, 1991; NAA, 2016). Individuals with Wernicke's aphasia typically have difficulty understanding spoken words and producing meaningful content, while their ability to produce fluent connected speech is unimpaired (Papathanasiou & Coppens, 2017; NAA, 2016). While no specific information was provided about the IWA's site of injury, this diagnosis was congruent with clinical observations and family report of his resulting behaviors.

Table 3.1

*IWA's Results on the Western Aphasia Battery (WAB)*

Composite Domain	IWA's Composite Score
Spontaneous Speech	7.00
Auditory Verbal Comprehension	3.45
Repetition	0.00
Naming and Word Finding	0.03
Aphasia Quotient (AQ)*	20.96

\*The AQ is calculated based on WAB composite scores; maximum AQ = 100.

**Communication Partner**

The IWA's wife acted as his CP for the purposes of this project. She was an appropriate choice for a communication partner because she and the IWA lived together and spent a significant amount of time together. She was highly involved in his recovery process and was willing and motivated to partake in the study. Furthermore, she was the IWA's documented power of attorney. The CP spoke English as a first language, exhibited normal language abilities, and reported normal hearing for an individual her age.

**Intervention**

For this single-subject A<sub>1</sub>-B-A<sub>2</sub> study, the research was conducted in four phases. The IWA-CP dyad participated in weekly speech-language therapy sessions, lasting 60 minutes each. The study took place at the UNC clinic, which was a familiar and confidential setting for the participants. The therapy room was large and contained a table and chairs. One of the walls across from the table contained a one-way observation glass as well as video monitoring equipment, allowing the clinical supervisor (a licensed and certified SLP) to supervise all sessions. Furthermore, the therapy room always contained various "props" on the table for use in conversation, including: a personalized communication book, maps of the local area, a newspaper, blank papers, whiteboards, pens, and markers. The same materials were available in all sessions, during all phases and probes.

## Phase One

**SCA-based communication partner training.** Prior to data collection, the primary researcher facilitated a training for the CP. The purpose of the training was to introduce the idea of supported conversation, identify non-facilitative behaviors from conversation partners during conversation, and role-play some facilitative strategies in conversation. The training emphasized the CP's ability to reveal the IWA's competence through the use of multi-modal communication. The aim of this technique was to help the CP ensure that her messages were clear and to teach her the strategy of verifying her understanding of the IWA's responses through verbal and non-verbal means—as the combination of modalities may facilitate greater comprehension. An outline of the adapted SCA training protocol is provided in Appendix D. This outline was created prior to the training, using Hall and Hord's (2006) concept of the Innovation Configuration Map (IC-Map) checklist, to provide a detailed training rubric.

***Fidelity of training.*** The primary researcher video-recorded the CP training session and referenced the IC-Map checklist to ensure that all training components were adequately delivered. This measure was created for two reasons: first, to support that the primary researcher's implementation of the training was as it was intended; and second, to allow for future replication of the structured training. While the IC-Map checklist was intended to be scored during later review by the committee chair, the recording device did not capture the entire training session due to inadequate storage space. Therefore, the IC-Map was not utilized as a rubric to support the fidelity of the training. Regardless, it was used by the primary researcher to guide the session and ensure that all intended aspects of the training were delivered in a structured, replicable format.

## **Phase Two**

**Baseline 1 (pre-intervention).** In order to establish that any progress or improvement in multi-modal conversation between the IWA and the CP was the result of the experimental condition and not of other means, the researcher obtained four baseline probes during the few weeks of the project (Bain & Dollaghan, 1991). A stable baseline (wherein 80% of the data points fell within 25% of the median value) was desired prior to the introduction of the experimental condition in Phase Three (Gast & Ledford, 2014); however, this phase was limited to a maximum of four weeks based on the timeline of the study. During baseline probes, the dyad participated in unstructured conversation after a randomized topic was provided by the primary researcher. The IWA-CP dyad was instructed to start conversation based on this initial topic, although they could allow the conversation to flow into other topics as they pleased. A communication book, newspaper, and map of the local area were provided, as well as blank paper, whiteboards, pens, and markers. The dyad was told to use any means that they thought helpful to convey and comprehend messages. Each baseline conversation was timed for 10 minutes and video recorded for later review and scoring.

## **Phase Three**

**Chat Sheets.** In Phase Three, the experimental condition, the primary researcher introduced Chat Sheets as a tool to promote multi-modal communication techniques. The dyad participated in three 10-minute structured conversations with Chat Sheets across the next three weeks of sessions. Chat Sheets always included an initial randomized topic, pre-loaded images, keywords, and artifacts to support verbal conversation. Further, the dyad was permitted to use any of the resources that were available to them in the baseline



phases (i.e., a communication book, newspaper, map of the local area, blank paper, whiteboards, pens, and markers). The IWA-CP dyad was instructed to start conversation based on the topic noted on their Chat Sheets, although they could allow the conversation to flow into other topics as they pleased. They were told to use any means that they thought helpful to convey and comprehend messages. Each experimental conversation was timed for 10 minutes and video recorded for later review and scoring.

#### **Phase Four**

**Baseline 2 (post-intervention).** The final baseline phase was comprised of the same conditions, resources, and tools as the initial baseline phase; again, the dyad was given a topic, and they participated in unstructured conversation without the use of Chat Sheets. A communication book, maps of the local area, a newspaper, blank papers, whiteboards, pens, and markers were still available for use to support verbal information. Per usual, the conversation was timed for 10 minutes and video recorded for later review and scoring. Precautions were taken to ensure that the therapy room was set up in the same way during each video collection; thus, raters remained blind as to which sessions were baseline sessions and which were experimental sessions.

### **Conversation Constructs**

#### **Conversation Topics**

Conversation is a free-operant behavior that is complex and unpredictable (Kagan et al., 2001). For research purposes, it was necessary to assign an initial conversation topic to each session to provide comparable conversation structure. Prior to commencement of the study, each discussion topic was randomly designated to a baseline or an experimental session using a random number generator. All topics were open-

ended, with the potential to stimulate the IWA to share nuanced information that may not already be known to the CP. Careful consideration was given to selecting topics with similar levels of complexity, so that the baseline and the experimental conversations were comparable. The list of pre-determined conversation topics is included in Appendix E, in the order by which they were presented chronologically following randomization.

### **Chat Sheets**

Chat Sheets were created by the primary researcher to include photographs, illustrations, keywords, writing prompts, and artifacts that may be referenced and engaged with during conversation about a selected topic. Refer to Appendix F for an example of the Chat Sheets used during Phase Three of this study.

## **Operational Definitions for Outcomes**

### **Multi-Modal Communication**

For the purposes of this study, the term “multi-modal communication” refers to the pairing of verbal and non-verbal information to convey a point. Each instance of paired verbal and visual information was considered a multi-modal utterance (e.g., saying the word “fishing” while pointing to a picture of fishing; saying the word “good” and giving a thumbs-up gesture; saying the word “happy” while writing it on a white board).

**Non-verbal categories.** Adapted from Cunningham and Ward (2003), the following four categories of non-verbal communicative behaviors were subject to frequency counts when paired with verbal or vocal communication attempts:

***Use of preexisting visuals.*** A visual was defined as the communicative use of a picture, book, magazine, newspaper, artifact, or physical object to convey meaningful information. For example, one individual in the dyad may point to a photograph to

enhance understanding of the item being referenced. If a previously written word was referred to, it was identified as a visual reference rather than a written behavior.

***Use of writing or drawing.*** This behavior was defined as a communicative use of written or drawn information. The strategy was scored once an attempt was completed and received by the communication partner. If something was later added to a drawing that produced new information, the attempt would warrant a separate score.

***Use of gesture.*** A gesture was broadly defined as a purposeful, symbolic, upper body signal—including head nodding, shoulder shrugging, meaningful hand movements, purposeful pointing, intentional facial expression, and pantomiming. If the same gesture was used repeatedly in one communicative idea without adding further meaning, it would be scored only once. If multiple distinct gestures were used within the same communicative idea, but appeared to add meaning, they would each be scored individually.

***Use of touch.*** Use of touch was defined as a positive movement resulting in physical contact, which was initiated to catch the listener's attention or convey reassurance.

### **Successful Exchanges**

In addition to the number of times the dyad used multi-modal utterances in conversation, the frequency of successful exchanges was also noted. That is, the study accounted for the number of instances that a verbal and non-verbal pairing of information resulted in clear comprehension for both parties during each condition.

Clear comprehension by the CP was perceived when she demonstrated one of the following behaviors: nodded her head in agreement, gave a “thumbs-up” gesture,

verbally affirmed understanding, said a variation of “yes” or “that’s right,” responded with an accurate summary of what the IWA affirmed he meant, or carried on with the conversation appropriately. Clear comprehension by the IWA was perceived when he: nodded his head in agreement, pointed at the CP with an affirming smile, exclaimed “oh!” to demonstrate understanding, gave a “thumbs-up” gesture, verbally affirmed understanding, said a variation of “yes,” or carried on with the conversation by adding relevant information.

### **Data Collection**

A representative measure of conversation requires the investigation of the IWA in the context of another. With that in mind, data were collected on the following questions:

- Q1     Following an SCA-based communication partner training, does the use of “Chat Sheets” result in a greater frequency of multi-modal utterances in conversation between the IWA and his trained spouse?
- Q2     Following an SCA-based communication partner training, does the use of “Chat Sheets” result in a greater number of comprehensible exchanges between the IWA and his trained spouse in conversation?

### **Procedures**

The IWA and the CP participated in a 10-minute video recording of conversation during each weekly session. This procedure was chosen because this length of video observation is typically sufficient for scoring (Correll, van Steenbrugge, & Scholten, 2010; Kagan et al., 2004). The clinician did not participate in the conversations, and the dyad’s environment was set up the same each session to ensure that the video raters remained blind to which sessions were part of the baseline or experimental conditions.

## **Video Scorers**

Two blinded video raters were involved in scoring the dyad's conversations via video analysis. Both raters were graduate clinicians, completing their Masters degrees in Speech-Language Pathology at the University of Northern Colorado during the project.

**Event recording.** Event recording is the simplest system for measuring behavior (Gast & Ledford, 2014). Using event recording, the blind raters observed each of the 10-minute videos and noted occurrences of the target behaviors. Data sheets were provided for each video, in which scorers recorded each instance of the target behavior, along with time stamps and classification notes about the observed non-verbal behavior (e.g., gesture, written word, etc.). They also indicated whether they perceived the multi-modal communication to be successful in facilitating comprehension. The video scorers were permitted to watch each video only once, pausing and rewinding as necessary.

**Count.** Count refers to the number of times the target behaviors occurred during data collection. According to Gast and Ledford (2014), count is an appropriate dependent measure for free-operant social behaviors when the observation period is held constant throughout all data collections. In order to present data that could be reliably scored, the primary researcher split the videos into 5-second increments, totaling 120 time windows per video. Thus, for the purposes of this study, "count" refers to the number of time windows that multi-modal communication was observed out of a possible 120 time windows. This number was derived for each video by averaging the counts between video raters.

**Fidelity.** To ensure scoring fidelity, the video raters and the primary researcher met prior to the start of the study for a thorough training session, which consisted of five

parts: (1) Introduction to aphasia and communication partner training; (2) Educational video on SCA (Kagan, 1998) followed by a discussion of its major components; (3) Practice video review of a representative conversation between the IWA and CP with on-line frequency counting of target behaviors; (4) Practice video review of a representative conversation between the IWA and CP with no on-line feedback while counting the target behaviors; (5) Calculation of inter-rater reliability between both scorers to determine if further training was warranted prior to the commencement of the study.

**Reliability.** Video scorers recorded time stamps to allow for point-by-point calculation of inter-rater reliability (number of observer agreements, divided by the total number of observation intervals, multiplied by 100). This represents the extent to which the two independent scorers were in agreement about their observed frequency counts (Hegde, 2003). According to Paul (2014), an 80% agreement or higher indicates “good agreement,” and thus, acceptable reliability. Following the training, the scorers achieved acceptable agreement and thereafter, began independently scoring all data collection videos. The data collection videos were assigned a randomized number to further prevent scorer bias.

Using the information provided by the video scorers, the primary researcher recorded the presence or absence of the target behavior within each 5-second time window. Specifically, for each time window, the primary researcher extrapolated a count of either 1 or 0; 1 if there was any evidence of multi-modality communication within the time window, and 0 if the video scorer did not note any multi-modality communication in the time window. This was done for each of the videos and inter-rater reliability was calculated using a point-by-point analysis of all time windows. The primary researcher

was careful to consider instances when the time stamp between the two raters crossed two time windows (e.g., one rater noted a target behavior at 25 seconds, and the other rater noted the same instance of multi-modality communication at 26 seconds). This was easily navigated, as the video scorers consistently wrote details about the target behavior they observed next to the time stamp (e.g., CP wrote the word “hunting”), which allowed the primary researcher to determine whether the time stamps corresponded or not.

Additionally, precautions were taken to ensure that crossing time stamps would not change the count for that time window, which prevented the data from being skewed one way or another. Of note, the primary researcher deduced this information from the video raters’ scoring sheets while they were still randomized; hence, the researcher was unaware of which scoring sheets corresponded to the baseline or experimental conditions. This measure reduced the potential for researcher bias.

Following point-by-point analysis for each video, inter-rater reliability was calculated (number of time windows in agreement, divided by a total of 120 time windows, multiplied by 100). If the agreement between video raters was less than 80%, they met to count the frequency of the target behaviors together until they reached full consensus.

### **Data Analysis**

Conventionally, approaches to single-subject data analysis rely on visual inspection, which is most appropriate for an  $A_1$ -B- $A_2$  design with one participant dyad. This is because each data point within each condition is generated by the same person (or in this case, dyad)—thus, a core assumption of statistical analysis is violated (i.e., the data points are not independent of one another; the error terms are not independent of one

another) (Byiers, Reichie, & Symons, 2012; McReynolds & Kearns, 1983). The key limitation of statistical analysis for single-subject design studies is the inevitable auto-correlation displayed by the data, which indicates that any data point is dependent on and interacts with the data point preceding it (Dugard, File, & Todman, 2012). Hence, the primary researcher mainly relied on visual analysis measures to evaluate the data collected in each condition.

### **Visual Analysis**

The visual analysis of graphic data, in contrast to statistical analysis of data, is the most frequently used data analysis strategy within single subject research designs (Byiers et al., 2012; Gast & Spriggs, 2014). Visual graphical analysis of an A<sub>1</sub>-B-A<sub>2</sub> design has several advantages for clinical research, including: utility for evaluating data of individuals or small groups; dynamic process of repeated data collection; focus on individual data patterns to facilitate individualization; and the ability to determine neither over-estimated nor under-estimated effectiveness of an intervention with an individual participant (Gast & Spriggs, 2014). Along with these reasons, visual analysis of graphic data has proven to be both practical and reliable; therefore, Gast and Spriggs (2014) recommend its adoption by clinicians involved in applied single-subject research. Two basic properties of data were critically examined by the primary researcher via visual analysis: level and trend.

**Level.** The term “level” refers to the magnitude of data as designated by the data points’ graphical coordinates (Byiers et al., 2012). When visually analyzing graphic data, level stability and level change are two basic aspects of interest.



***Level stability.*** Level stability is the amount of variability or range in data point values within a condition. When there is a low variability of values, and thereby, a low range of values, the data are considered “stable.” According to Gast and Spriggs (2014), it is desirable for 80% of the data points from one condition to fall within a 25% range of the median level of all data point values in that condition—in this case, the data is sufficiently stable. To calculate the median level of a data series, the primary researcher sequenced the data point values in each condition from low to high and selected the middle value (the median). Then, a horizontal “median line” was drawn at that value, and a “stability envelope” was designated around the median line. The purpose of a stability envelope is to maintain a consistent definition of the term, “stable.” Using Gast and Spriggs’ (2014) criteria, the data were stable if 80% of the data points fell on or within 25% of the median value.

***Level change.*** Another consideration is the amount of change in level within the same condition. Level change within a condition may be reported in two ways. For the purpose of this study, calculating the absolute level change within a condition was more appropriate than calculating the relative level change within a condition because each condition contained only three to four data points (Gast & Spriggs, 2014). The primary researcher calculated the absolute level change between adjacent conditions by comparing the value of the last data point in the A<sub>1</sub> condition with the value of the first data point in the B condition; then, the primary researcher compared the value of the last data point in the B condition with the first data point in the A<sub>2</sub> condition. If the level increased between conditions, a therapeutic direction was noted, while a contratherapeutic direction was noted if the level decreased (Gast & Spriggs, 2014).

**Trend.** When conducting a visual analysis, the trend of a data series is important to report along with level of performance. When reported together, visual analysis of these variables can indicate reliable experimental control (Gast & Spriggs, 2014). Trend direction and stability were calculated for the data series in each condition.

**Slope.** The direction of trend, or slope, refers to the steepness of the data trajectory across sessions. If the trend displayed an increase of value on the graph over multiple sessions, the primary researcher used the term “accelerating” to describe the slope. Contrarily, if the trend displayed a decrease of value on the graph over multiple sessions, the term “decelerating” was used. Finally, if the data series remained parallel to the horizontal x-coordinate of the graph, the slope was deemed “zero-celerating.”

*Freehand method of slope estimation.* Due to the small number of data points in each condition, the primary researcher visually inspected the data of each condition and drew a straight line to bisect the data points (Parsonson & Baer, 1978). While this method only yields an estimation of the slope, the actual trend is depicted by the raw, plotted data points. The slope estimation allowed for the researcher to approximate the direction of trend in each condition.

**Trend stability.** Trend stability was evaluated by using the same stability envelope that was calculated using the 80%–25% formula (Gast & Spriggs, 2014) and placing it over the trend line. If 80% of the data points fell on or within the stability envelope, the trend was considered “stable.”

### **Calculating Effect**

Along with visual analysis measures, it is important to consider the overlap of data values among conditions. In a single-subject A<sub>1</sub>-B-A<sub>2</sub> design, the percentage of non-

overlapping data (PND) is most frequently reported to indicate the effect of an intervention or dependent variable (Byiers et al., 2012; Gast & Spriggs, 2014).

**Percentage of non-overlapping data.** The primary researcher calculated the PND among each adjacent comparison condition. In general, a higher PND value within a data set indicates a greater intervention impact on the target behavior (Gast & Spriggs, 2014). To compute this percentage, the primary researcher first determined the range of values for the A<sub>1</sub> condition, the number of data points in the B condition, and the number of data points in the B condition that fell *outside* of the range of values in the A<sub>1</sub> condition. Then, the primary researcher divided the number of data points outside of the range of values in the A<sub>1</sub> condition by the total number of data points in the B condition and multiplied the resulting number by 100 to derive a percentage (PND). The same process was completed to compare the B condition with the adjacent A<sub>2</sub> condition. A resulting PND greater than 90% was considered highly effective, between 70% and 90% was considered fairly effective, between 50% and 70% was considered questionably effective, and a PND lower than 50% indicated unreliable or ineffective treatment (Scruggs, Mastropieri, Cook, & Escobar, 1986).

### **Social Validity**

#### **Informal Interview**

The primary researcher facilitated an informal interview with the CP at the end of the study. The purpose of the interview was to determine if she felt that the Chat Sheets influenced comprehension for her and her husband, and whether they helped her convey information in a multi-modal way. Further, the interview allowed the CP an opportunity to mention whether she would like to continue using Chat Sheets in therapy sessions,

whether she would be interested in using them at home, and thoughts that she had about making the Chat Sheets more practical and helpful in their conversations. This brief interview was video recorded for the purpose of including direct quotes as social validity measures. Refer to Appendix G for the list of questions addressed during the interview, and transcribed responses from the CP.

## **CHAPTER IV**

### **RESULTS**

#### **Data Analysis**

This single-subject A<sub>1</sub>-B-A<sub>2</sub> study was designed to investigate the efficacy of Chat Sheets as a conversational tool for a married dyad. Two outcomes were analyzed to determine the efficacy of Chat Sheets in conversation: the frequency of multi-modal communication, and the frequency of comprehensible exchanges. Both quantitative and qualitative data were collected to investigate the target outcomes, based on behavioral counts from video raters and information from an interview at the conclusion of the study.

#### **Reliability**

The primary researcher calculated inter-rater reliability between video raters during training phases and data collection. Inter-rater reliability was considered acceptable if it was greater than or equal to 80% (Paul, 2014). Following the video rater training, the scorers achieved acceptable agreement on a practice video (81.5%) and thereafter, began independently scoring all data collection videos. They achieved “good” inter-rater reliability on eight of the videos independently (ranging from 81.6% - 92.5%), but two videos fell below the level of 80% agreement (49% and 75%)—thus, the video scorers met to watch the two videos together and resolved all discrepancies until 100% agreement was achieved for both videos.

## **Validity**

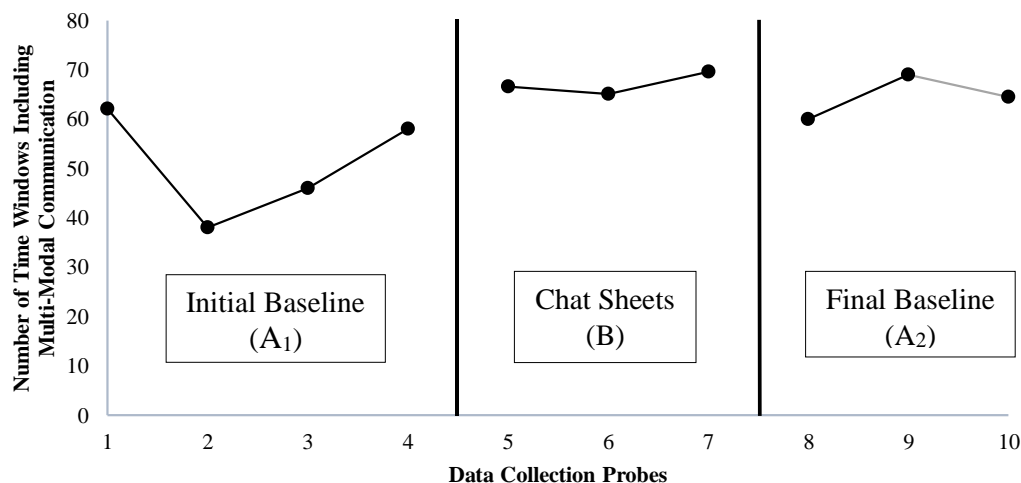
Classifications of non-verbal communication attempts (i.e., referencing a pre-existing visual, writing a key word, making a gesture, using physical touch) were valid markers of multi-modal communication, as supported in Cunningham and Ward's (2003) study. The categories of non-verbal communication included in the study were also reliably identified by video raters, as this outcome was factored in to inter-rater reliability calculations.

Contrarily, frequency counts of resultant “comprehension” were determined to be an invalid and insensitive measure—the video raters experienced great difficulty perceiving whether or not a multi-modal communication attempt resulted in true comprehension for the listener. This issue emerged during data analysis, when the primary researcher noted that both video raters deemed nearly every multi-modal utterance as comprehended, but expressed that they felt the listener may or may not have truly understood. Despite clear constructs and operational definitions of comprehension, the measure was determined invalid based on its subjective, micro-behavioral nature. In response, the primary researcher solely used social validity data from an interview with the CP to answer the second research question.

## **Visual Analysis**

The primary researcher utilized visual analysis measures to evaluate the data collected in each condition for the first research question. Figure 4.1 illustrates the data plotted in a line graph across each condition—initial baseline, Chat Sheets, and final baseline, respectively—separated by a vertical boundary line. Video numbers were plotted on the x-axis, and the number of time windows with evidence of multi-modal

communication (averaged between video raters) was plotted on the y-axis. The data were analyzed for specific parameters to inform the effect of treatment. Specifically, level stability, level change, slope, and trend stability were investigated.



*Figure 4.1.* Time windows including multi-modality communication for all probes

**Level stability.** In order to determine the amount of variability within the data, the primary researcher calculated the median level and stability envelopes for each condition. The median values within baseline and experimental phases are indicated by the horizontal, dashed lines in Figure 4.2. Then, a level “stability envelope” was designated around the median line, outlined by the blue boxes in Figure 4.2. Gast and Spriggs (2014) indicate that 80% of the data points from a condition should fall within a 25% range of the median level of all data point values in that condition to be considered sufficiently stable. Based on this criteria, the A<sub>1</sub> phase did not achieve stability (less than 80% of the data points were within the stability envelope). Nonetheless, the B phase and the A<sub>2</sub> phase were both considered stable (100% of the data points were within the stability envelope).

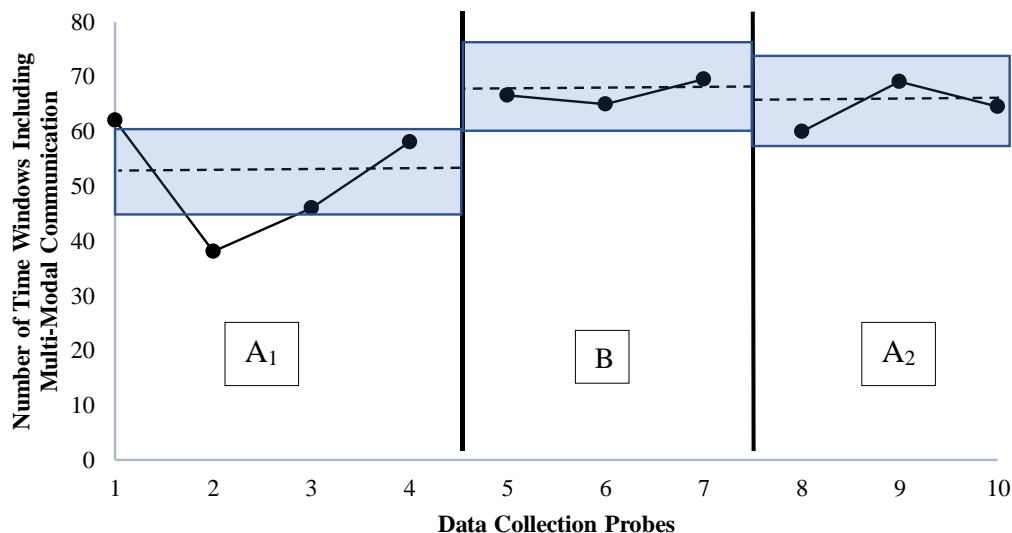


Figure 4.2. Median level and level stability envelopes for each condition

**Absolute level change.** The primary researcher identified the absolute level change between each adjacent condition. In this case, if the level increased, a therapeutic (improving) direction was noted, while a contratherapeutic (deteriorating) direction was noted if the level decreased (Gast & Spriggs, 2014). The change in level from the A<sub>1</sub> condition to the B condition was therapeutic (improving by 8.5). The change in level from the B condition to the A<sub>2</sub> condition was contratherapeutic (deteriorating by 9.5).

**Slope.** Due to the small number of data points in each condition, the primary researcher visually inspected the data of each condition and bisected the data points with a straight line (Parsonson & Baer, 1978). This method, called freehand method of slope estimation, yielded an approximation of the slope. Slope estimations in each condition were verified by trend calculations in Microsoft Excel. The direction of trend in the A<sub>1</sub> data set was “zero-celerating,” while the trends in the B and A<sub>2</sub> data sets were “accelerating” (Gast & Spriggs, 2014). The slopes of all conditions are depicted by the red lines in Figure 4.3.



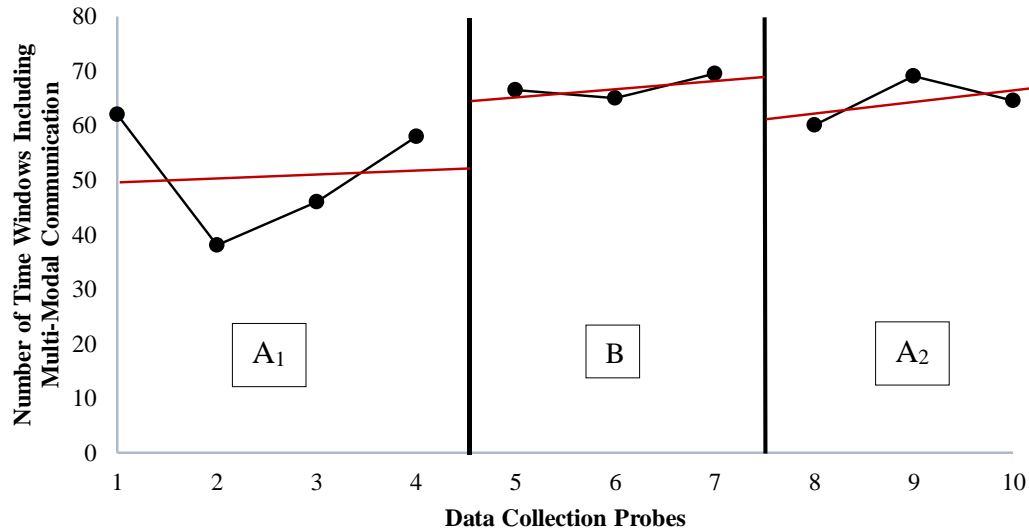


Figure 4.3. Slope estimation for each condition

**Trend stability.** A stability envelope was placed over the trend line, as indicated by the dashed lines in Figure 4.4. The A<sub>1</sub> phase did not achieve trend stability (only 50% of the data points were within the stability envelope); however, trends for the B phase and the A<sub>2</sub> phase were both considered stable (100% of the data points fell within the corresponding stability envelopes).

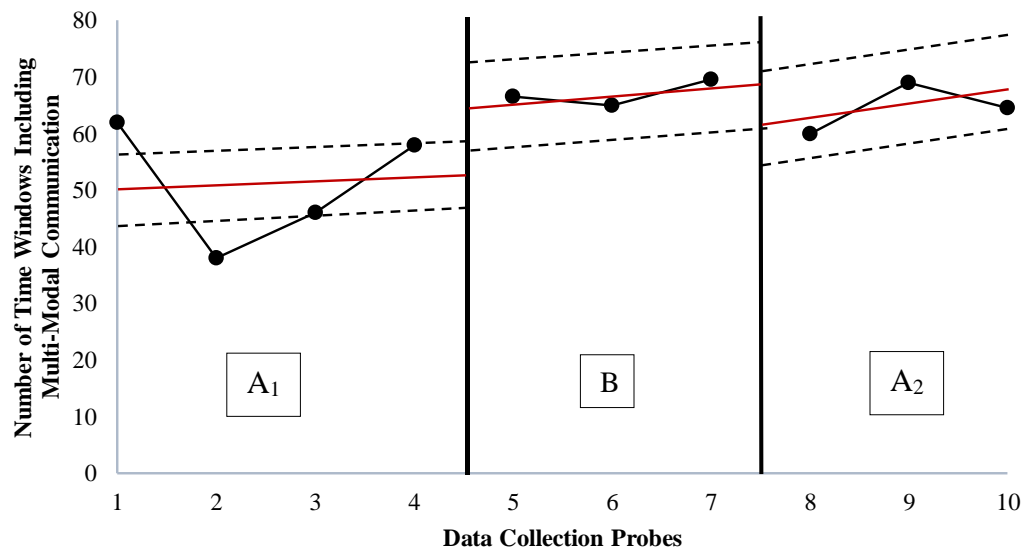


Figure 4.4. Trend stability envelopes for each condition

## Calculating Effect

**Data overlap.** The percentage of non-overlapping data (PND) was calculated to indicate the overall effect of the experimental condition (Byiers et al., 2012; Gast & Spriggs, 2014). The data revealed that the Chat Sheets were “highly effective” when comparing the A<sub>1</sub>-B conditions (PND = 100%), however, between the B-A<sub>2</sub> conditions, the effect of the Chat Sheets was “questionable” (PND = 66.7%) (Scruggs et al., 1986). Figure 4.5 demonstrates the PND for all adjacent conditions, as outlined by the horizontal gray box.

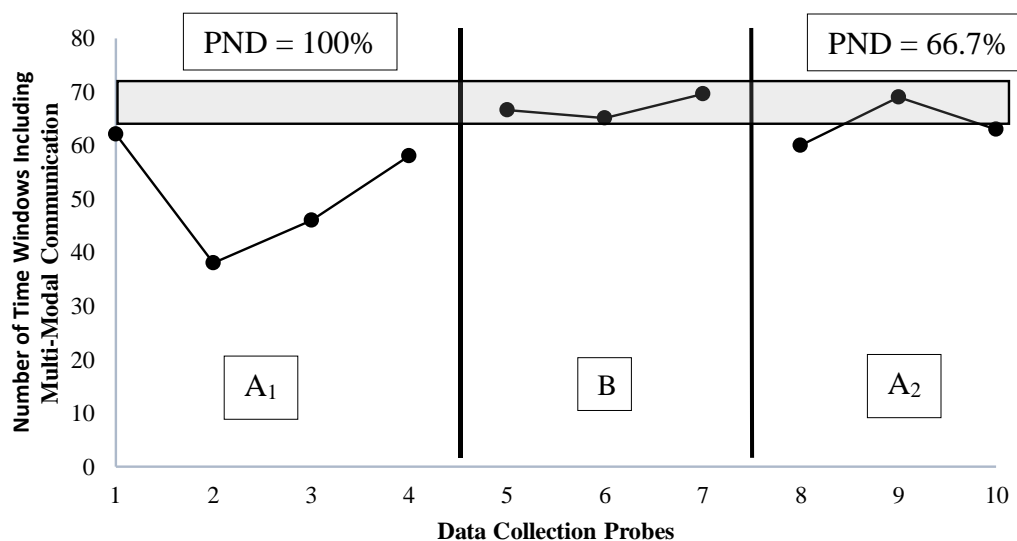


Figure 4.5. Percentage of non-overlapping data among all conditions

## Informal Results

Informal measures, including a participant interview and category notes on multi-modal utterances, supplemented the formal outcome data. These descriptive measures aided the primary researcher in answering the two posed research questions.

## Non-Verbal Categories

Informal data were gathered regarding the variety of multi-modal communications that the dyad used in each condition. While these data were not reported

formally for lack of reliability, the primary researcher used video rater data sheets to determine behavior counts for each operationally defined non-verbal category (i.e., use of pre-existing visuals, use of writing or drawing, use of gesture, and use of touch). These numbers were averaged across all videos in each study condition, as illustrated in Figure 4.6. Average category counts for use of pre-existing visuals, use of writing or drawing, and use of touch were highest in the B condition. Average category counts for use of gesture were highest in the A<sub>2</sub> condition, after Chat Sheets were withdrawn.

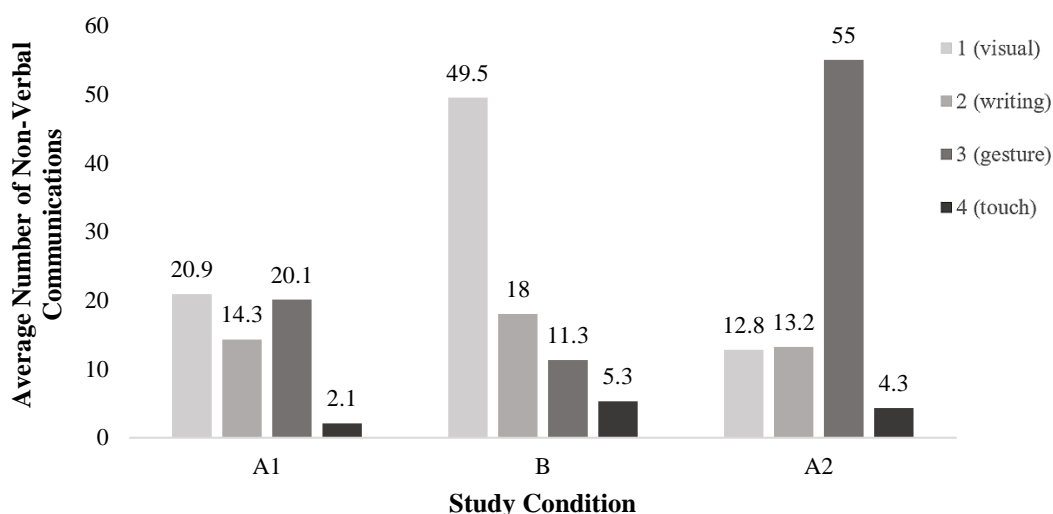


Figure 4.6. Non-verbal category averages for each condition

### Qualitative Results

During an informal interview with the CP at the conclusion of the study, the primary researcher collected information about the perceived social validity of Chat Sheets as a tool for improved communication between the dyad. The information gathered from the interview was used to answer the second research question. The CP indicated that she perceived the Chat Sheets as a helpful tool to improve comprehension and topic maintenance during conversations with the IWA. She presented various themes

within her interview responses, especially highlighting the benefit of the Chat Sheets' pre-loaded pictures about a given topic:

They [the Chat Sheets] had pictures, so [the IWA] could right away catch on to what we were talking about. And it helped me understand him better. When he sees the pictures, right away, he knows what you're talking about and he doesn't need to think about it so hard, instead of being confused for a while.

Further, she explained that the visual stimuli on the Chat Sheets reduced the number of times that she had to repeat her communication attempts for the IWA to understand, stating that "the pictures seem to help him to, right away, know where we're going and what this is about, without me having to say it 2-3 times." Interestingly, she also explained that the structure of the Chat Sheets improved the IWA's ability to maintain a conversation topic, while reducing the number of times he "got lost" in conversations:

I think they [Chat Sheets] put [IWA] on track because he tends to change the subject. So, I think it keeps him on track and it sparks his memory when he sees pictures...he'll always say, 'oh, yeah' when he sees pictures and I think it gives him a structured thing... so with different questions, he can answer them, or try to answer them. If he has to think of the stuff on his own, he gets a little lost.

Of equal importance, the CP mentioned that the Chat Sheets made a qualitative difference in the IWA's demeanor during conversation. She perceived that they helped him feel calm and less frustrated, since the visual information helped him orient to and maintain the conversation topic:

I think it [the Chat Sheet] helps keep [IWA] on track because he tends to, well he'll corner you up and talk about something, and then in a minute or two he'll be talking about something else, so you've got two things together and you get lost. And if he is more concentrated on exactly what's there, and he can *see* it, I think it helps him and calms him too. I think sometimes he tries so hard, he gets frustrated because he's not sure that he's answering what we want to know. But if he can see a graph, drawing, or picture or something, he seems to understand it better. When you ask him something sometimes, I think he's hearing something else...or getting a step ahead, or behind. But when he sees a picture he knows exactly what

it is, exactly where we're going with it. You know, he doesn't seem to get as frustrated.

She continued with comments about how she felt that the Chat Sheets improved the IWA's social participation—specifically, that they helped her use facilitative communication strategies, and they helped him feel that he was part of the conversation:

It helps me use the strategies, and it helps...it helps him! And I think when we come here, he wants to do everything right and sometimes he's not getting what we're talking about...but he does with the pictures! I think that brings him with us...that brings him along, and he feels part of us. He knows he's in the clan, in the group, and I think it makes him feel like more of a part of the conversation.

Overall, qualitative data collected from the informal interview informed the second research question. The interview results suggest that Chat Sheets had a significant positive impact on the CP and IWA's comprehension, topic maintenance, and clear communication of ideas. Equally important, the CP indicated that she felt the Chat Sheets made the IWA feel calm, better included in the conversation, and less frustrated about communication breakdowns. Refer to Appendix G for the list of questions addressed during the interview, and comprehensive transcribed responses from the CP.

## **CHAPTER V**

### **DISCUSSION AND IMPLICATIONS**

#### **Interpretation of Results**

The purpose of this study was to investigate the efficacy of Chat Sheets for increasing multi-modal utterances and comprehensible exchanges in conversation for a married dyad affected by aphasia. Using visual analysis measures and information from a participant interview, both research questions were answered and discussed.

#### **Graphical Interpretation**

In an A<sub>1</sub>-B-A<sub>2</sub> study design, experimental control is demonstrated when a stable baseline (A<sub>1</sub>) is achieved, followed by a stable data trend in the experimental condition (B), and an abrupt change in level and trend in the final baseline condition (A<sub>2</sub>) (Gast & Ledford, 2014). As such, the results from this study must be interpreted with caution due to the instability of the data in the A<sub>1</sub> condition and the small number of probes within each phase.

**Level stability and change.** Based on criteria from Gast and Spriggs (2014), the A<sub>1</sub> phase did not achieve sufficient stability, as only 50% of the data points fell within the stability envelope. This implied moderate variability in the initial baseline data set. Ideally, the primary researcher would have continued collecting baseline data over a greater number of sessions until stability was reached, but this was not possible due to the study's limited timeline. Nonetheless, stability was attained in the B and A<sub>2</sub> data sets, which indicated acceptable variability in level for the experimental and final baseline data

sets. Based on these findings, Chat Sheets may have promoted more consistent use of multi-modal conversation strategies between the IWA and his spouse—effects which carried over into the A<sub>2</sub> phase after the structured tools were withdrawn.

Additionally, the change in level from the A<sub>1</sub> condition to the B condition was therapeutic, since the frequency of multi-modal communication increased when the dyad had access to Chat Sheets. Evidence from visual analysis demonstrated a contratherapeutic change in level from the B condition to the A<sub>2</sub> condition, as the frequency of multi-modal utterances decreased when the Chat Sheets were withdrawn. Combined, data regarding level change between adjacent conditions suggested an answer for the first research question—the dyad’s conversations did, in fact, yield a markedly higher frequency of multi-modal utterances using Chat Sheets as compared to both baseline conditions. Therefore, Chat Sheets had an overall therapeutic effect on multi-modality conversation.

**Trend and trend stability.** Slope estimation revealed that the direction of trend in the A<sub>1</sub> condition was “zero-celerating,” while the trends in the B and A<sub>2</sub> data sets were “accelerating” (Gast & Spriggs, 2014). The slopes of the B and A<sub>2</sub> conditions convey an increasing trend in multi-modality utterances after Chat Sheets were introduced. After Chat Sheets were withdrawn, the level initially decreased but an increasing trend of multi-modality utterances persisted. Of note, the initial baseline phase did not achieve trend stability, as only 50% of the data points were within the stability envelope; yet, trends for the experimental phase and the final baseline phase were both considered stable, with 100% of the data points inside of the corresponding stability envelopes.

**Intervention effect.** The data regarding PND signified that the Chat Sheets were “highly effective” when comparing the A<sub>1</sub>-B conditions, but only “questionably effective” when comparing the B-A<sub>2</sub> conditions (Scruggs et al., 1986). Resultant PND values suggested that the introduction of Chat Sheets promoted significant treatment effects; however, it is worth addressing that the effects did not diminish after the Chat Sheets were withdrawn. Specifically, one of the three data points in the A<sub>2</sub> condition overlapped with the range of values in the B condition data set. This overlap suggested that increase in multi-modal utterances was possible even without access to a Chat Sheet. Lamentably, the effect of Chat Sheets on multi-modal communication may have been more accurately captured given a greater number of probes (Gast & Spriggs, 2014).

### **Informal Observations**

Using operational definitions from Cunningham and Ward (2003), the video scorers categorized each of the dyad’s observed multi-modal utterances. Based on an average count, the primary researcher noted a marked increase in use of pre-existing visuals, writing and drawing, and touch between the dyad when Chat Sheets were introduced in the B condition, and a decrease in gestural communication. Remarkably, the dyad’s use of pre-existing visuals more than doubled from the A<sub>1</sub>-B conditions—from an average of 20.9 to 49.5—likely, a change that can be attributed to the availability of relevant pre-loaded pictures, illustrations, and key words on the Chat Sheets. After the Chat Sheets were withdrawn, the data depicted an upsurge in the average number of gestures used between the dyad and a significant decline in the average number of times a pre-existing visual was referenced. Although the dyad had access to various visuals in all conditions, they relied more on gestural communication in the absence of Chat Sheets.



### **Social Validity**

A post-study interview with the CP was conducted to answer the second research question and provide information about the social validity of Chat Sheets. The CP indicated that she appreciated the Chat Sheets because they positively influenced the dyad's topic maintenance and overall comprehension during conversations. She presented various themes within her interview responses, especially highlighting the benefit of the Chat Sheets' pre-loaded pictures. The CP perceived that the Chat Sheets provided sufficient structure in nuanced conversations with the IWA, as they oriented him to the topic and gave him multiple stimuli to comment on—both of which reduced his frustration and reduced the CP's need to repeat her utterances “two to three times” for a successful exchange. In support of the second research question, interview data suggested that Chat Sheets did result in a perceived greater number of comprehensible exchanges between the IWA and his trained spouse in conversation.

### **Clinical Implications**

Given the data from formal and informal observations, there may be clinical applications for the use of Chat Sheets following a communication partner training. For an IWA, communication partner training is a functional environmental approach to improve social participation in conversation; however, training alone may not be sufficient in promoting the use of multi-modal communication between an IWA and his or her spouse. Results from this single-subject study suggest that practitioners cannot fail to recognize the difficulty of acquiring supportive conversation skills for a spouse affected by aphasia. In response, best practice may involve structured tools to facilitate desired conversational strategies and outcomes. Chat Sheets may be one method for

bridging the gap between training and application for a communication partner. An individualized, SLP-created tool has the potential to promote topic orientation, topic maintenance, non-verbal communication, and overall comprehension between a married dyad, which transcends concrete conversations and targets social relationships. These outcomes align with the most frequently reported goals of those with aphasia—to improve social participation in life activities (Brown et al., 2012; Worrall et al., 2011).

### **Limitations of Study**

Surely, improvements in conversation (e.g., mutual comprehension) may not be quantifiable through a “count” of behaviors. Therefore, a principal limitation of this study was the quantitative nature of the outcome measures, which may have lacked the sensitivity to illustrate the effect of Chat Sheets on the independent variables. Moreover, the behaviors of interest were difficult to count in a reliable way, which initially hindered inter-rater reliability. To improve agreement between video raters, the primary researcher reported the presence of multi-modal communication within 5-second time windows rather than reporting a raw number of multi-modal utterances. While this mitigated reliability issues, reporting the number of time windows that the target behavior was observed may have been less sensitive to changes among conditions. Additionally, the primary researcher was unable to derive reliable information about mutual comprehension from the behavior counts, and instead used qualitative information from an informal interview. All considered, the primary researcher was unable to form a compelling report that the observed improvements in multi-modal communication and comprehension were a direct result of the Chat Sheets and not merely the result of task familiarity, practice, or other extraneous factors.

The time constraints of this study were also a significant limitation, allowing for only three to four probes in each condition. That being said, the primary researcher had to move on from baseline probes prior to attaining true stability—since the baseline phase showed an unstable and increasing trend, it was difficult to determine the true impact of Chat Sheets on conversation between the dyad. Furthermore, the small sample size of this study has implications on the generalizability of the results to other couples affected by aphasia. While Gast and Ledford (2014) suggest replication of the experimental effect with other participants (direct inter-subject replication), the primary researcher was unable to access additional participants—thus, limiting the scope of this investigation.

Finally, the Chat Sheets' effect on multi-modal communication may not be a phenomenon that can be “unlearned,” and a withdrawal design may not be an appropriate measure of intervention outcomes. It is imperative that target behaviors are reversible with all variations of A-B-A designs (Gast & Ledford, 2014), yet the behaviors promoted by Chat Sheets may not abide by this methodological assumption. As demonstrated by the final baseline phase of the study, after Chat Sheets were introduced, the trend, level, and stability of data accelerated in a stable and therapeutic manner. After Chat Sheets were withdrawn, the absolute level change of the data was contratherapeutic, but the stability and trend remained positive. Perhaps this was a result of the structured tool, alluding to generalization of target skills across conditions—therefore, further research is needed regarding intervention gains and carry-over of therapeutic skills across conditions.

### **Directions for Future Study**

Communication partner training continues to be a growing intervention method in aphasiology. Numerous training methods have been developed to address an IWA's communication abilities through such social participation models; yet, despite many years of research, no structured, family-centered tools are available to facilitate conversation.

This study provided preliminary evidence that a structured conversation tool may enhance target behaviors following communication partner training, adding to the current research base on dyad-focused approaches (e.g., Cunningham & Ward, 2003; Saldert et al., 2015; Simmons-Mackie et al., 2005; Wilkinson et al., 2010). Chat Sheets may help family members apply facilitative conversation strategies (e.g., use of multi-modal communication) and improve dyadic comprehension; however, future research is necessary to support clinical outcomes. For one, a longer study duration is paramount to obtaining stable data sets in both experimental and control phases. According to Gast and Ledford (2014), a minimum of three stable data points must be established in the initial baseline phase to minimize variability and distinguish the effect of all conditions. If the initial baseline data set is unstable, it is essential to continue data collection until stability is reached.

Second, this study suggested that Chat Sheets may promote carry-over of target skills following withdrawal. It is worth mentioning that the ultimate goal of speech-language intervention is to teach an IWA to use his or her own unique strengths and compensations, while equipping family members with the knowledge, confidence, and strategies to support their loved one's communication outside of therapy. Therefore, the

carry-over and generalization of facilitative communication strategies resulting from the use of Chat Sheets is a meaningful outcome that warrants future study.

Third, in this investigation, a post-study interview with the CP revealed the perception that Chat Sheets reduced dyadic frustration while improving the IWA's sense of social inclusion, as compared to baseline conversations. These are meaningful measures of change in conversational quality which warrant further inquiry. Perhaps the current literature base in aphasiology could be supplemented through investigation of Chat Sheets' influence on quality of life measures, especially pertaining to reduced frustration and improved feelings of inclusion for an IWA. For instance, Kagan's (1999) SCA approach has improved CPs' ability to acknowledge and reveal the competence of an IWA, as well as promote the IWA's interactive and transactive communication—results which may be compounded by improvements in quality of life and perceived engagement with the use of Chat Sheets as a resource.

All considered, in order to measure carry-over, generalization, social participation, and quality of life changes resulting from the application of Chat Sheets, a multiple-baseline study or a qualitative study investigating patient-reported outcomes (PROs) would be better suited methodological designs to capture meaningful outcomes across conditions for multiple participants. A study with a greater sample size is also needed to convey the efficacy of Chat Sheets for a wider scope of individuals with aphasia and their trained family members.

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APPENDIX A  
INSTITUTIONAL REVIEW BOARD APPROVAL



*Institutional Review Board*

DATE: October 10, 2018

TO: Shyanne Heise, B.S.  
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1287692-3] UNC Graduate Thesis  
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED  
APPROVAL DATE: October 8, 2018  
EXPIRATION DATE: October 7, 2019  
REVIEW TYPE: Expedited Review

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB has APPROVED your submission. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on applicable federal regulations.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of October 7, 2019.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Nicole Morse at 970-351-1910 or [nicole.morse@unco.edu](mailto:nicole.morse@unco.edu). Please include your project title and reference number in all correspondence with this committee.

APPENDIX B

CONSENT FORM VISUAL AID

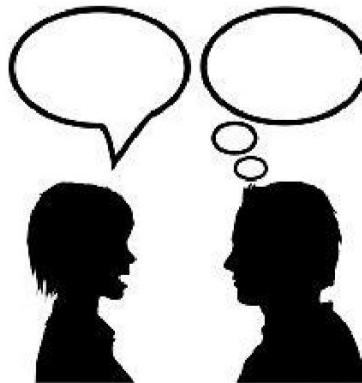


## RESEARCH

### 1. Video Recording



### Conversation



(Adapted from Kagan, 1999)

## RESEARCH

### 2. Schedule

September 2018						
SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

November 2018						
SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

October 2018						
SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

December 2018						
SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

How Long?



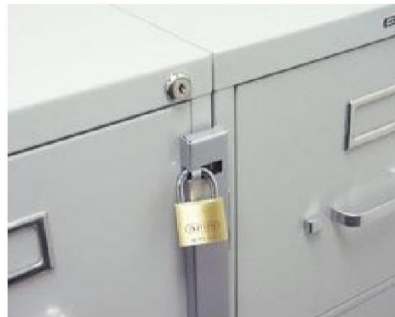
9-12 weeks

(Adapted from Kagan, 1999)

## RESEARCH

### 3. Confidential

~~Name~~



Locked



(Adapted from Kagan, 1999)

## RESEARCH

### 4. Safe

- X** There is **NO** danger  
in participating in this study.



### 5. Right to Withdraw

- ✓ You **can stop** at any time.
- ✓ It is **your choice**.
- ✓ It is **ok** to quit.



(Adapted from Kagan, 1999)

## RESEARCH

### 6. Consent

I **agree** to participate in this research project.



YES



NO



(Adapted from Kagan, 1999)

APPENDIX C  
CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH



CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH  
UNIVERSITY OF NORTHERN COLORADO

**Project Title:** The Efficacy of “Chat Sheets” as a Conversation Tool for Communicative Access in Aphasia: A Single-Subject Study

**Researcher:** Shyanne Heise, B.S., Speech-Language Pathology Graduate Student

**Research Advisor:** Dr. Miranda Babiak, CScD, CCC-SLP, ASLS Assistant Professor

**Researcher Phone:** (719) 238-2641 **E-mails:** [Shyanne.Heise@unco.edu](mailto:Shyanne.Heise@unco.edu) ; [Miranda.Babiak@unco.edu](mailto:Miranda.Babiak@unco.edu)

**Purpose and Description:** The primary purpose of this study is to determine the efficacy of different communication tools after a training on strategies. The project will not exceed 12 weeks. The protocol involves video-recorded conversations during each session, and the research team will be measuring the quality and modality of your conversations as a dyad.

In the beginning, a training session will be scheduled for one dyad member to review a video and talk about facilitative conversation strategies. At this time, the member will have opportunities to learn and practice new conversation techniques. Next, you will begin the weekly video-recorded conversation sessions together, not to exceed 12 sessions. Finally, the trained member of the dyad will participate in an informal interview about the experience.

Throughout the project, we will take every precaution in order to maintain your confidentiality. Only the lead investigator and the clinical supervisor will know your full name, and graduate level research assistants will be familiar with your likeness and first names. When we report outcomes from the video analyses, your name will never be used. The videos collected for this study will be recorded on a password protected iPad and kept confidentially for 3 years, after which they will be destroyed. This iPad, when not in use by the researchers or the research assistants, will be kept in a locked file cabinet in one of the research committee members' office—Gunter Hall room 1510. This file cabinet is only accessible by the researcher and UNC Audiology and Speech-Language Science department faculty.

Potential risks and benefits in this project are minimal. Speech-language pathologists (SLPs) and graduate clinicians will be the populations who most benefit from the results of this study.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any questions or concerns about your treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; # (970) 351-1910.

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Researcher's Signature

\_\_\_\_\_  
Date

APPENDIX D

OUTLINE OF ADAPTED TRAINING PROTOCOL



<b>Key Elements</b>	<b>Ideal Implementation (4)</b>	<b>In Process (2)</b>	<b>No Implementation (0)</b>
Introduction to SCA	Primary researcher provides a handout and briefly explains the idea of revealing competence using SCA. Explanation is clear and addresses questions at the end.	Primary researcher provides a handout or briefly explains the idea of revealing competence using SCA. Explanation is somewhat clear and the CP may not understand.	Handouts and explanations are not provided.
Video Review	Video review of conversation before and after SCA is utilized to increase CP's awareness of non-facilitative and facilitative communication strategies. These are explained and contrasted using the video.	Video review of conversation before and after SCA is utilized but non-facilitative and facilitative communication strategies are not identified or explained with the CP.	Video review is not completed or discussed.
Explicit Instruction and Modeling	Primary researcher explicitly teaches and models the following SCA strategies to "get, give, and verify" information: non-verbal communication (gestures, reference pictures, write keywords, draw pictographs), ensuring a means of response, using wait time, and verifying comprehension by summarizing what the IWA said.	Primary researcher explicitly explains and models 1-3 of the SCA strategies to "get, give, and verify" information (i.e., non-verbal communication, ensuring a means of response, using wait time, or verifying comprehension).	No explicit strategy instruction or modeling from the primary researcher.
Role-Playing Facilitative Strategies	A short role-play is utilized to apply the SCA strategies taught to "get, give, and verify" information. The scenario is appropriate and proper materials are provided.	Role-play is utilized but the proper materials are not provided, or the scenario is inappropriate.	Role-play is not utilized.
Debrief of Facilitative Strategies	The primary researcher references the handout to recap the strategies that were discussed. The CP is given a chance to ask questions.	The primary researcher references the handout but does not recap the strategies that were discussed. The CP is given a chance to ask questions.	The handout is not referenced, and the CP is not given a chance to ask questions.

APPENDIX E  
RANDOMLY ASSIGNED CONVERSATION TOPICS

1. Things that you are proud of.
2. What advice would you give to a teenager about life?
3. What do you want to be remembered for?
4. Favorite memories during the time that you were dating.
5. What was the happiest time in your life? Why?
6. What other country would you like to visit? What would you do there?
7. Tell me something about when you were a kid.
8. If you could teach a class on something, what would you want to teach?
9. Tell me a story about when you or your siblings got in trouble as a child.
10. If you won the lottery, what would you do with the money?

## APPENDIX F

### EXAMPLE CHAT SHEET USED IN THE EXPERIMENTAL CONDITION

Topic: What was the **happiest** time in your life? Why?



Tell me what  
you remember

Having children



Starting a **family**



Do you have any **funny**  
**stories** about **your kids**?

What was the **happiest** time in your life? Why?

Starting your own **business**



Fixing boilers

Building your **house and barn**



**Road trip**

**Where?** What did you do there? With who?



Buying your **first car**

What was your **1<sup>st</sup> car**?  
How much did it **cost**?

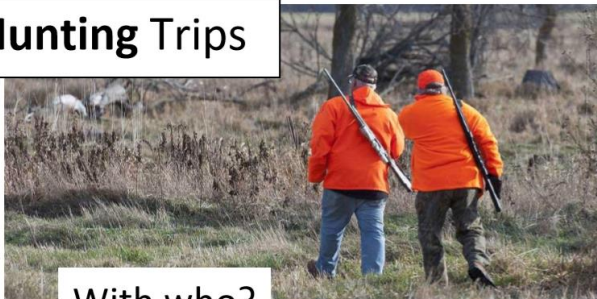
Staying in a **cabin**



Where? When?  
**What did you do there?**

What was the **happiest** time in your life? Why?

### Hunting Trips



With who?  
Show me.

### Fishing Trips



Tell me about it.

### Happiest years:

(circle one!)

- Childhood
- 20s
- 30s
- 40s
- 50s
- 60s
- 70s

### Your **favorite** memories:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

### Best day of your life:

\_\_\_\_\_

APPENDIX G  
INFORMAL INTERVIEW TRANSCRIPTION



**1. Tell me what you thought about the Chat Sheets.**

“Well I think they helped. I think they made it a little easier for [IWA]...because it wasn’t just him trying to think of stuff on his own, it was asking him different questions and then he could think about it. It was good.”

**2. What did you think was helpful about them?**

“Well, I think because they asked different questions that I wouldn’t have thought to ask, and they had pictures, so [the IWA] could right away catch on to what we were talking about. And it helped me understand [IWA] better. When he sees the pictures, right away, he knows what you’re talking about and he doesn’t need to think about it so hard... instead of being confused for a while. I think the family one triggered some memories that he...well, we’ve always teased him about setting that field on fire and his mom used to talk about it all the time, but for the first time, [the IWA] said it wasn’t him, and he never, after all these years, he never told that it wasn’t him... he never, ever told anyone that he didn’t do it. He just took the blame for it and we’d just laugh it off. He’d say that he got his butt beat but he never, ever told us in 50 years, he never said ‘I didn’t do it’ until we had that conversation.”

**3. What could be changed to make them more helpful for you and [the IWA]?**

“Well, I think the pictures help a lot...I don’t know what else you could change. You know, the more pictures the better.... pictures seem to wake up [IWA’s] memories. I would like to find his Navy book and see if the pictures in there could help, because he can’t remember being in the Navy. But just like the fire story, you know, I don’t know if something in his brain just remembered that he didn’t do it. It’s just weird because in 52 years he never said he didn’t do it. I don’t know if it’s just something he just now remembered, or what. The pictures seem to help him to, right away, know where we’re going, and what this is about, without me having to say it 2-3 times. You know, this has been a long hard struggle, and this year, since we started here, it just seems like he’s gotten 100% better. It’s just a shame that other speech therapists don’t know about this. It is unbelievable how this helps. Someone came over the other day and they couldn’t believe the things [IWA] was saying—they couldn’t believe how much better he talked.”

**4. Would you be interested in using Chat Sheets in future sessions? Why or why not?**

“Yes! [Talking to the IWA] yes, remember the packets that she made? When you open them up and she had like pictures and different questions? You liked that. Yeah, oh yeah. We liked them and we’d like to use them again.”

**5. Did the Chat Sheets help you and [the IWA] use certain strategies in conversation? If so, which strategies?**

“Well, like I said, I think they put [IWA] on track because he tends to change the subject. So, I think it keeps him on track and it sparks his memory when he sees pictures...he’ll

always say, ‘oh, yeah’ when he sees pictures and I think it gives him a structured thing so with different questions, he can answer them, or try to answer them. If he has to think of the stuff on his own, he gets a little lost.”

**6. Do you think you would use Chat Sheets to practice conversation strategies at home? Why or why not?**

“Yes. And it even helps at home. I think it helps keep [IWA] on track because he tends to, well he’ll corner you up and talk about something, and then in a minute or two he’ll be talking about something else, so you’ve got two things together and you get lost. And if he is more concentrated on exactly what’s there, and he can *see* it, I think it helps him and calms him too. I think sometimes he tries so hard, he gets frustrated because he’s not sure that he’s answering what we want to know. But if he can see a graph, drawing, or picture or something, he seems to understand it better. When you ask him something sometimes, I think he’s hearing something else...or getting a step ahead, or behind. But when he sees a picture he knows exactly what it is, exactly where we’re going with it. You know, he doesn’t seem to get as frustrated.”

“It helps me use the strategies, and it helps...it helps him! And I think when we come here, he wants to do everything right and sometimes he’s not getting what we’re talking about...but he does with the pictures! I think that brings him with us...that brings him along, and he feels part of us. He knows he’s in the clan, in the group, and I think it makes him feel like more of a part of the conversation. I don’t think that [the Chat Sheets] should be *all* though, because he needs to have a communication book too.”