

BAMA PERKS: THE USE OF SIMULATED CONTEXT AS TREATMENT FOR ADULTS

WITH APHASIA

by

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## ABSTRACT

There is a growing interest in examining the efficacy of aphasia treatment programs that examine meaningful real-life outcomes rather than therapeutic outcomes within structured intervention settings (Chapey et al., 2008). This study measured language abilities, social networks, and quality of life for nine patients with aphasia over a ten-week span during a simulated coffee shop social communication intervention called Bama Perks. Using an evaluative approach, strengths and weaknesses were examined and results supported the feasibility of Bama Perks as a supplement to traditional therapy. Clinician and caregiver measures indicated client improvement in language skills and social communication skills, a growth in social networks, and a reduction in burden of diagnosis. Daily rating scales taken during each Bama Perks session revealed variability with marginal growth across measures of communication function, flexibility, and overall communication production. These findings contribute to growing evidence supporting socially simulated environments as therapeutic contexts for individuals with aphasia.

## LIST OF ABBREVIATIONS

UA	The University of Alabama
MIT	Melodic Intonation Therapy
ORLA	Oral Reading for Language in Aphasia
SCI	Supported Communication Intervention
ASHA	American Speech-Language-Hearing Association
MoCA	Montreal Cognitive Assessment
BOSS	<i>The Burden of Stroke Scale</i>
CDS	<i>Communicative Difficulty Scale</i>
CAPDS	<i>Communication-Associate Psychological Distress Scale</i>
NMS	<i>Negative Mood Scale</i>
PMS	<i>Positive Mood Scale</i>
WAB-R	<i>Western Aphasia Battery-Revised</i>
CETI	<i>Communicative Effectiveness Index</i>
SNA	<i>Social Network Analysis</i>
CVA	Cerebrovascular Accident
PPA	Primary Progressive Aphasia
TBI	Traumatic Brain Injury

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## CHAPTER 1

### INTRODUCTION

Aphasia is an acquired language disorder caused by damage to the language-dominant hemisphere of the brain. Damage is usually the result of a stroke or a traumatic brain injury. Aphasia affects all modalities of language, including an individual's ability to speak, understand, read, and write. More people have aphasia than those who have cerebral palsy, multiple sclerosis, Parkinson's disease, or muscular dystrophy (National Aphasia Association, 2015). The disorder has a greater negative impact on a person's quality of life than cancer or Alzheimer's disease (Lam & Wodchis, 2010). Persons with aphasia and their families consistently cite the loss of established relationships and social isolation as the major negative changes in their lives (Davidson, B., Worrall, L., & Hickson, L., 2003, Kagan & Gailey, 1993, Walker-Batson, D., Curtis, S., Smith, & Ford, J. 1999).

One individual with aphasia described the impact on social communication like this:

"Before my stroke, I talk to shop keeper, trades people, it's easy. But aphasia....it's difficult."

The same client described attendance at a community aphasia group like this:

"Fun, it's fun. And I meet friends, made lots of friends through that." (Davidson, Worrall, & Hickson, 2006).

Treatment for aphasia typically focuses on improving specific communicative impairments (i.e., training specific language skills that were lost) in a clinic or medical setting, one-on-one with a speech-language pathologist. However, to offset the negative changes on the quality of life reported by individuals with aphasia, the use of treatment approaches emphasizing social participation has been suggested.

### **Treatment History: Common Forms of Standard Treatment and Outcomes**

Traditionally, treatment for individuals with aphasia is provided in a structured clinical setting and directed toward two goals: (1) restoration of specific linguistic processes and/or (2) compensation of lost abilities (Park & Ingles, 2001). These goals are typically addressed using traditional treatment approaches such as repetitive stimulus-response type tasks. An example of this would be drilling the client for naming items with a category provided by the clinician.

Traditional treatment approaches for aphasia have been shown to be efficacious for improving language. However, skills trained using traditional treatment approaches in structured clinical settings are not often observed outside the therapy context, especially in less structure, more natural communication situations (Purdy & Kooch, 2006). Real-life participation experiences that focus on facilitating natural communication contexts and foster social interactions are considered to be critical to the recovery process. Therefore, there is a growing interest in examining the efficacy of treatment programs that aim to produce meaningful real-life outcomes (Chapey et al., 2008).

As evidenced by the wide variety of impairments, aphasia can manifest itself in many difficulties for the person affected. Moreover, each client is different in how the problems may overlap. The treatment of aphasia depends on the area of the lesion and the manifestation of the

impairments. Aphasia can manifest itself in impairments of verbal expression, auditory comprehension impairments, reading comprehension, and written language (Aphasia: Overview, 2015). These impairments can exist in any combination of difficulties. Often, a client with aphasia experiences weaknesses in both expressive and receptive language modalities, but each person differs in the degree of difficulty and manner of manifestation. Also, person can experience writing and reading difficulties respective to the difficulties found in expressive and auditory comprehension (Aphasia: Overview, 2015).

A person with verbal expression impairments will have any of the following problems which can occur in any combination: word finding or anomia, broken, mixed-up, or effortful speech, omitting function words, such as “the” or “a,” making up words or neologisms, superfluous speech lacking content (Aphasia: Overview, 2015).

Client with auditory comprehension impairments will have any of the following problems which can occur in any combination: “difficulty understanding spoken utterances,” “providing unreliable answer to “yes/no” questions,” “failing to understanding complex grammar,” “requiring extra time to understand spoken messages,” “finding it very hard to follow fast speech,” “misinterpreting subtleties of language,” “lacking awareness of errors” (Aphasia: Overview, 2015).

Someone with aphasia may have reading comprehension impairments that include any of the following: “difficulty comprehending written material,” “difficulty recognizing some words by sight,” “inability to sound out words,” “substituting associated words for a word,” and “difficulty reading noncontent words” (Aphasia: Overview, 2015).

Also, someone with aphasia may have written language impairments that include any of

the following: “difficulty writing or copying letters, words, and sentences,” “writing single words only,” “substituting incorrect letters or words,” “spelling or writing nonsense syllables or words,” “writing run-on sentences that don't make sense,” “writing sentences with incorrect grammar” (Aphasia: Overview, 2015).

Therapy must be tailored to the individual and can include a variety of approaches (Aphasia: Overview, 2015). Over the years, research has found certain techniques to be useful for a wide scope of individuals with aphasia. Some are the following: Melodic Intonation Therapy, Semantic Feature Analysis, reading comprehension strategies, writing extended narratives, speaking extended narratives, Oral Reading for Language in Aphasia (ORLA), and audio-visual therapy. Melodic Intonation therapy is “treatment using intonation patterns (melody, rhythm, and stress) to increase the length of phrases and sentences. Reliance on intonation is gradually decreased over time. MIT targets improvement in spoken language expression.” Semantic Feature Analysis is “a word retrieval treatment where the person with aphasia identifies important semantic features of a target word (e.g., building, books, quiet for "library"); this is thought to activate the semantic network and possibly aid in retrieval of non-targeted but related words.” Oral Reading for Language in Aphasia (ORLA) and audio-visual therapy. ORLA is “treatment using auditory, visual, and written cues to assist the person with aphasia in reading sentences aloud” (Aphasia: Treatment, 2015). Audio-visual therapy involves the use of an iPad with headphones. The client watches a video of a mouth speaking while listening to the words being spoken. This treatment has been proven effective for clients specifically with expressive language deficits or fluent aphasia (Fridriksson et al., 2009). Auditory and reading comprehension strategies include reading information and relaying it back, writing information

just told or read, and answering questions after reading or hearing information. This helps with language abilities that aphasia affects. Writing and speaking extended narratives involve the client receiving a prompt or watching a short video clip and answer the question or relaying the information back in a cohesive manner, whether written or spoken. These traditional techniques may be utilized with or without each other depending on the level and type of intervention the client needs. Overall, speech-language therapy in standardized treatment rooms is clinician-directed and utilizes the above techniques in a drill-like manner. As a result, these types of treatment approaches do not lend themselves to carryover of therapy in the every day interactions as a natural environment.

Along with individual treatment for the client with aphasia, it is important to coach the caregiver in the process of being an effective “communication partner” and helper in the real world outside of the therapy rooms (ASHA, 2015). The therapist teaches the caregivers or conversational partners how to assist their loved one with aphasia. This includes “conversational coaching,” “Supported Communication Intervention (SCI),” and “Social and Life Participation Effectiveness.” Conversational coaching is a type of “treatment designed to improve communication between the person with aphasia and primary communication partners” (ASHA 2015). Supported Communication Intervention (SCI) is “an approach” that “emphasizes the need for multimodal communication, partner training, and opportunities for social interaction.” SCI includes using augmentative and alternative communication and “promoting social communication.” Lastly, Social and Life Participation Effectiveness is “an approach that focuses on the real-life goals of a person with aphasia, considering what the person can do with and without support.” This approach also includes the other people affected by the client’s aphasia

(ASHA 2015).

While the types of intervention for aphasia are wide and include a plethora of resources, contextual therapy has not been found to be as abundant in research literature as traditional treatment. Simulating an environment promotes the client's abilities to carryover and generalizes the therapeutic techniques into the real world in a way that normal therapeutic approaches do not (Holland, 1991, Carr, Hinckley, & Patterson, 2001, Davidson, Hickson, & Worrall, 2003, Boles & Lewis, 2003).

### **Social Simulation**

Current literature has demonstrated the effectiveness and significance of a socially simulated context as a therapeutic approach (Boles & Lewis, 2003, Carr, Hinckley, & Patterson, 2001, Davidson, Hickson, & Worrall, 2003, Holland, 1991). Studies suggest that natural environments lend well to generalizing therapy progress for adults with aphasia. Hinckley's work with a context-based approach revealed the importance of role-playing in intervention as reflected in the improvements made on post-treatment testing (2001). Also, Holland's research supports pragmatic approaches for the treatment of aphasia in conjunction with therapy targeted at treating specific language impairments. The data revealed that pragmatic approaches when used with other approaches were efficacious for the participants (1991).

Davidson et al. (2003) collected observational data on a client with aphasia, detailing the client's everyday interactions and revealed the importance of addressing language in all of its modalities. They concluded that due to the complicated nature of communication, a need to incorporate the social aspects of nature is critical for assessment (2003). This also reveals a need

to include the daily interactions in therapeutic settings if the assessment reveals findings of weaknesses in social communication.

Using conversation, Boles and Lewis' (2003) found that participants who had a stroke benefited from the natural communication partners and saw an increase in communication independence. The goal was to address the lack of communication rather than the aphasia and successfully did so in each couple who participated (Boles & Lewis, 2003). The research supports the importance of addressing communication in a natural or a socially simulated environment (Hinckley, Patterson, & Carr, 2001, Holland, 1991, Davidson, Worrall, & Hickson, 2003, Boles & Lewis, 2003).

### **Natural Setting and Dosage**

According to ASHA 2015, dosage “refers to the frequency, intensity, and duration of service.” According to Cherney’s research concerning Aphasia treatment, the proper amount of therapy for a client with aphasia has not been determined; although, some studies allude to the efficacy of intensive training depending on the type of treatment (Cherney, 2012). This does not include the possible amount of time addressed in the client’s natural setting with the caregiver or conversational partner.

### **Purpose**

The purpose of this study was to examine the feasibility and benefits of using a simulated real-life social environment within the University of Alabama Speech and Hearing Center as a treatment setting for individuals with aphasia. Research shows that pragmatic treatment, such as a coffee shop’s simulated environment and therapeutic intervention, should be used in conjunction with other approaches more explicitly focused upon the language deficits exhibited

by aphasic patients” such as verbal expression (Holland, 1991). Moreover, Davidson’s (2003) findings demonstrated that communication activity is multifaceted in terms of the type of communication and contextual factors, the “observational data describe[s] the effects of aphasia on a person's everyday communication activity and reveal the impact of aphasia on the social functions of communication including sharing information, maintaining and establishing relationships, and telling one's story.” In the coffee shop environment, the participants were able to talk at ease, commune with their conversation partner, and establish important relationships, which will bring value to the therapeutic interactions (Davidson, Worrall, & Hickson, 2003). Therefore, we hypothesized that participation within this simulated context would result in greater positive communication results in participants with aphasia; more specifically the following aims were addressed:

- 1) Determine the feasibility of incorporating a simulated real-life setting in to a university clinic setting using a logic model to evaluate the quality of Bama Perks implementation.***
- 2) Measure changes in participants’ communication function, social participation, and overall quality of life.***

## CHAPTER 2

### METHODS & PROCEDURES

#### **Participants**

Nine adult clients with aphasia enrolled at University of Alabama Speech and Hearing Center were recruited to participate in the Bama Perks study. In order to participate, participants had to be at least three months post stroke to control for the influence of spontaneous recovery on treatment outcomes (Lendrem & Lincoln, 1985). Due to the heterogenous nature of aphasia, participants ranged in abilities from fluent to non-fluent with difficulties in verbal expression and/or comprehension. However, effort was given to control length of time in treatment, as a client who has been receiving treatment for a longer period of time could see less change in progress than a client who had just begun receiving treatment. Each client started and ended treatment at the same time. The range of time following the incident was noted but did not affect the client's ability to participate in the study. Of the nine total, seven participants had a medical diagnosis of a cerebrovascular accident, one had a diagnosis of a traumatic brain injury, and one had a diagnosis of primary progressive aphasia. Seven of the participants were male, and two were female. All participants had a clinical diagnosis of aphasia. Participant characteristics are presented in Table 1.

Four Communicative Disorders graduate students who were completing clinical practicums in Speech and Hearing Center adult were assigned specific roles within Bama Perks.

Their roles included serving as the client’s clinician and conversing with the client, serving as a barista and making coffee, and working as a research assistant to help with setting up, maintaining, and closing the shop each day.

Table 1

*Participant Demographics with MoCA and WAB-R Scores*

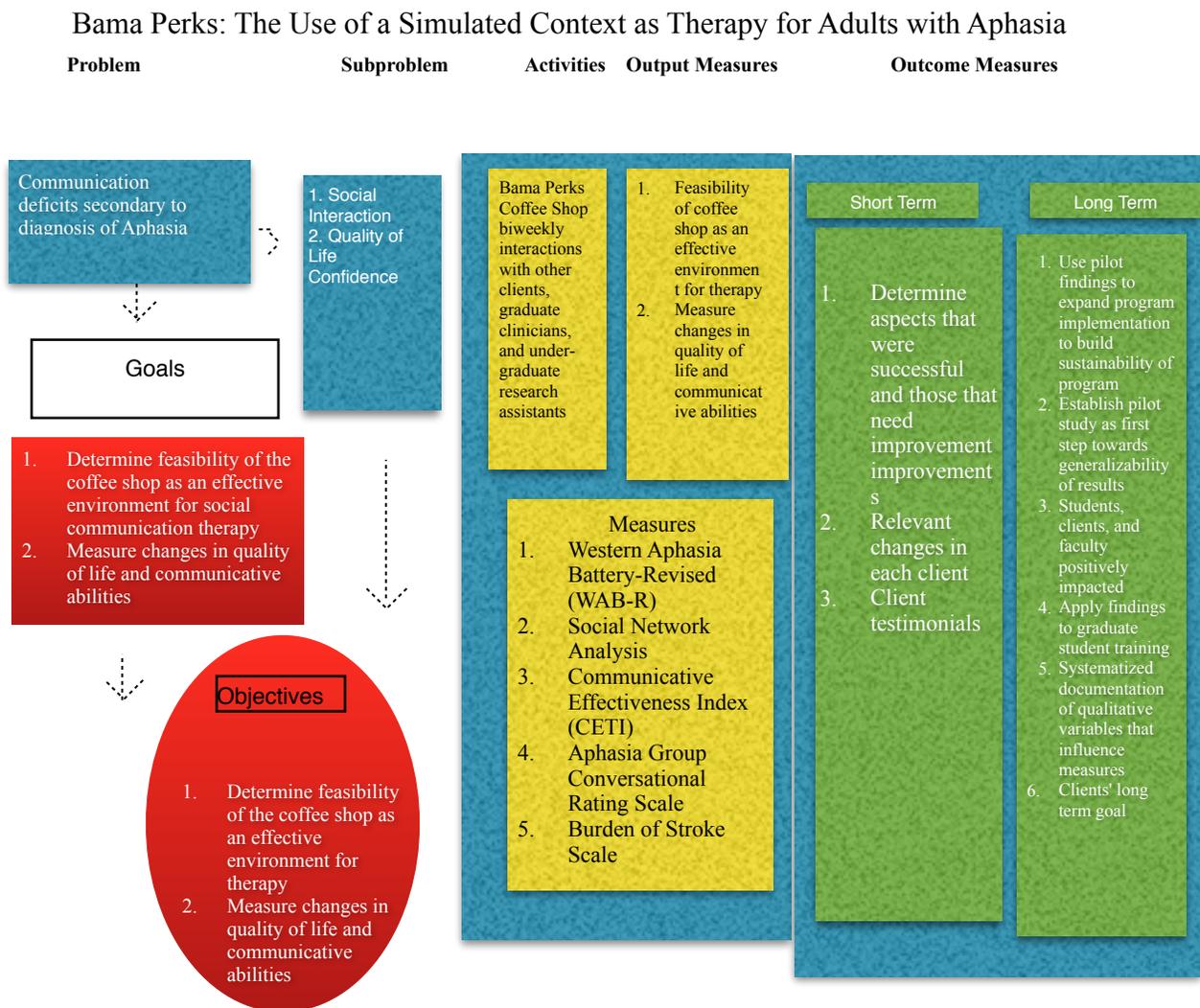
Participant	Age	Gender	Time Post-Onset	Diagnosis	MoCA Score	WAB-R Pre
1	65	Male	9 months	CVA	5	61.5
2	46	Male	6 months	CVA	28	93.4
3	54	Male	1 year, 6 months	CVA	22	84.9
4	69	Female	4 years, 9 months	CVA	25	76.4
5	64	Male	4 years, 9 months	CVA	13	84.8
6	46	Male	2 years, 6 months	TBI	20	85.5
7	69	Male	1 year, 7 months	PPA	21	68.2
8	71	Female	9 months	CVA	5	58.7
9	59	Male	7 years, 7 months	CVA	17	91.8

## Measures

To examine the feasibility of this project (Specific Aim 1), a logic model was created to evaluate factors contributing to the program's strengths and challenges. The logic model is presented in Figure 1.

Figure 1

Logic Model Figure of Bama Perks



The following factors were included in the logic model: acceptability of the program (e.g., participants' reactions to the intervention, graduate student learning outcomes); participant commitment and interest level; extent to which the intervention could be fully implemented changes to the existing clinical program in order to accommodate the addition of this program; and resources, time commitment, student training; and expansion opportunities (i.e., service/treatment and research). The following measures were administered pre- and post-participation to measure participants' communication function, social participation, and burden of stroke as a result of participation in the project.

The *Western Aphasia Battery-Revised (WAB-R)* (Wertz, et al., 2003) is a standardized assessment of language for patient with aphasia. The WAB-R measures speech production, auditory comprehension, reading comprehension, and writing. The clinician administered this test to the client. The total score is out of 100, with 100 being a perfect score and 0 being the lowest possible. A client's score delineates an aphasia quotient and may correlate to a specific type of aphasia, such as Broca's or anomic.

The *Social Network Analysis* (Simmons-Mackie & Damico, 1996a, 2001) visually illustrates the client's social scope and interactions with others including which environments they interact with others. The clinician administered this test to the client at three time points (pre, mid, post).

The *Montreal Cognitive Assessment (MoCA)* (Pendlebury et al., 2015) is a cognitive screener to assess cognitive abilities in clients. The clinician administered this test to the client to establish cognitive abilities. The test addresses various aspects of cognition, including the following: attention and concentration, executive functions, memory, language,

visuoconstructional skills, conceptual thinking, calculations, and orientation. The total of the MoCA is out of 30, with a score of 30 meaning all answers are correct. Each question is worth a certain number of points, and an incorrect answer subtracts what the question is worth. A score of 26 or above is considered normal. A score below 26 indicates possible cognitive deficits; however, no score was a basis for exclusion criteria.

*The Burden of Stroke Scale (BOSS; Doyle et al., 2004)*, is a measure of quality of life related to the burden of diagnosis. The clinician administered this test to the client. This measurement has four different scales, the Communicative Difficulty Scale, the Communication-Associate Psychological Distress Scale, the Negative Mood Scale, and the Positive Mood Scale. Each scale consists of questions the participant answered by pointing to the most accurate answer for how he/she felt. The Communicative Difficulty Scale had six questions with each question asking the client how difficult is it for him/her to complete an activity due to their incident. The scale was from 1, indicating "not at all" difficult, to 5, meaning "cannot do." The Communication-Associate Psychological Distress Scale consists of three questions asking the participant how often do difficulties communicating cause negative feelings, dissatisfaction, and prevention from participating in important life activities. The answers range from 1, meaning "never" or "not at all" to "always" or "completely." The Negative Mood Scale asks the client how frequently he/she feels lonely, anxious, angry or sad since the incident. The answers range from 1, indicating "never," to 5, indicating "always." Similarly, the Positive Mood Scale asks the client how frequently he/she has felt confident, happy, calm, and optimistic about the future. An answer of 5 indicates "never," and an answer of 1, indicates "always." A score in between the two end answers of the scale, such as a 2, 3, or 4, indicates "rarely," "a little," "moderately," "very," or

"often." The positive mood scale is inversely scored, 5 to 1, so that the number will go down similar to the other sub-scales. A score of 100 is the "least desirable health state," and a score of 0 is the "most desirable health state."

*Communicative Effectiveness Index* (CETI; Lomas et al., 1998) which is a rating scale completed by spouse or caregiver; compares the patient's current communicative performance with premorbid abilities. The caregiver completed test to the client. The Communicative Effective Index is a rating scale completed by the spouse or caregiver. This sixteen-question index compares the patient's current communicative performance with premorbid abilities. The measurement was completed through Qualtrics with a sliding numbered scale for the caregiver to use to answer each question. The rating scale for each question is from 0 to 100, with 0 indicating "not at all able" and 100 indicating the client is "as able as before" the incident. The closer the score is to 100 indicates a participant's abilities are more comparable to how they were pre-morbidly.

Of the seventeen total items, the following six were chosen that are most central to the research questions:

1. Getting someone's attention
2. Getting involved in group conversations about him/her
3. Having coffee, time visits, and conversations with friends and neighbors
4. Having a one-to-one conversation
5. Having a spontaneous conversation
6. Participating in a conversation with strangers

The *Aphasia Group Conversational Competence Rating Scale* (Sittner & Garrett, 1996), qualifies negative or positive changes in communication, functional ability, and social interactions. The clinicians and undergraduate research assistants completed this scale on the participant(s) interacted with after each session at the coffee shop.

### Intervention

Participants attended the coffee shop two days a week for a minimum of 30 minutes each day over the course of ten weeks. Activities were client-centered and focused on enhancing individual clients' communication and interaction with others. Individuals with aphasia will engage in multiple acts from greetings, to ordering a cup of coffee, asking questions, to sharing personal stories. Graduate students accepted orders, answered question, and engaged in conversations with the individuals with aphasia.

Participants were assigned to a time to come to the coffee shop based on the client's schedule and availability. The participants received weekly traditional therapy treatment in addition to the interactions at the coffee shop.

### Bama Perks Therapy Approach Strategies

The Bama Perks coffee shop utilized a simulated natural environment to conduct therapeutic interactions for adults with each other and with clinicians. The clients engaged by ordering coffee, talking to other clients, and carrying conversations with the clinicians. Graduate clinicians accepted coffee orders and served as a conversational partner with the clients.

Intervention targets for the environment and conversational interactions focused on the client's verbal expression and comprehension of others' interaction with them. The clients lead the conversations and the graduate clinicians engaged in discussion or simply listen as the client

converses. The graduate clinicians encouraged the client's participation if the client did not interact by engaging in conversation. Conversations were facilitated through questions from clients and clinicians and topics of interest at the table, such as current news and personal stories. Thus, the coffee shop setting created a naturalistic context while still serving as an area for clinician supported therapeutic activity.

## CHAPTER 3

### RESULTS

Nine clients with aphasia participated in this study. The average age of this sample was 60.3 years of age. Seven males and two females participated. Six clients had a diagnosis of CVA, one PPA, and one TBI. MoCA scores ranged from five to 28 (*mean* = 17.33; *SD* = 8.20). Initial WAB-R scores ranged from 58.7 to 93.4 (*mean* = 78.35; *SD* = 12.84). Participating caregivers were wives, family members, and primary caretakers.

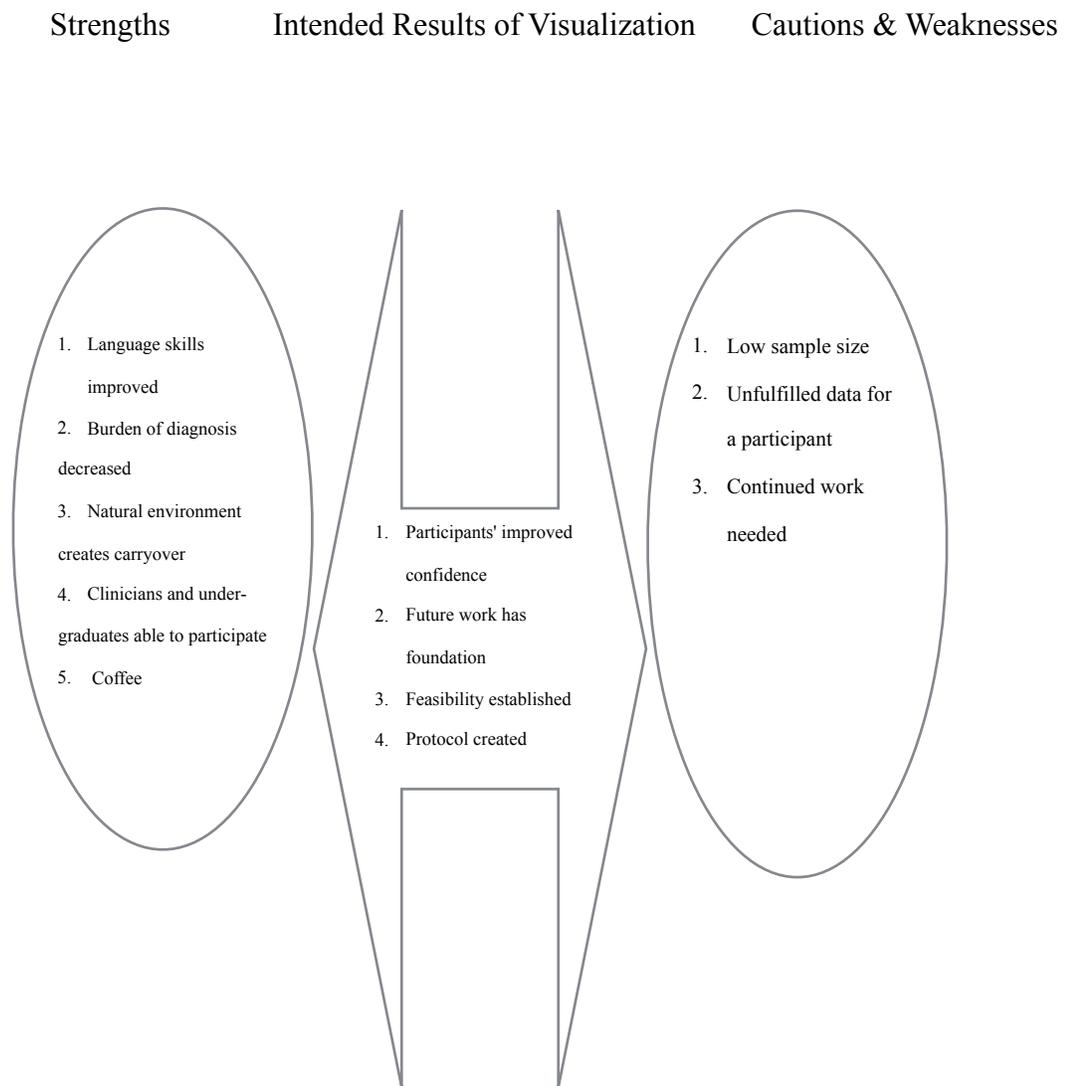
#### Feasibility

The overarching purpose of this project was to determine the feasibility of implementing Bama Perks within the UA Speech and Hearing Center. In order to address feasibility, an evaluative approach was taken and a logic model was developed and revisited at the conclusion of the 10-week intervention to identify strengths and weaknesses of the program (Quinn, 2002). See Figure 2 for the Qualitative Data Visualization. Strengths of the study include improvements in participant language skills, a decrease in the burden of diagnosis, carryover from therapy conducted in the natural environment, enjoyable discussions with coffee, and clinicians and undergraduate research assistants participated in the study. Cautions and weaknesses of the study include low sample size, unfulfilled data for participants, and a need for continued work to achieve generalization. The intended results of the study were achieved in that participants

achieved gains individually, feasibility was proven, and future work now has a foundation upon which to build.

Figure 2

*Qualitative Data Visualization*



## Participant Data

All clients demonstrated an increase in WAB-R scores as seen in Table 2. Considering the small sample size and violations to ANOVA assumptions, non-parametric analyses were conducted. A Wilcoxon signed-rank test revealed a statistically significant mean increase in scores from pre to post ( $t = -3.268, p < .005$ ). Participant one, seven, and eight had a diagnosis of Broca's aphasia and experienced improvements on the WAB-R. Participant two, three, four, five, six, and nine had a diagnosis of anomic aphasia and remained at that diagnosis while increasing in aphasia quotient scores.

Table 2

*Pre-Test and Post-Test Scores for the Western Aphasia Battery-Revised (WAB-R)*

<u>Participant</u>	<u>WAB-R Pre-Test</u>	<u>WAB-R Post-Test</u>
1	61.5	65
2	93.4	95.4
3	84.9	88.9
4	76.4	93.6
5	84.8	85
6	85.5	94.6
7	68.2	73
8	58.7	63
9	91.8	95.8

Data for participants five and seven were incomplete and therefore CETI data for 7 participants are presented. Individual CETI data are presented in Figures 4 through 10.

Although data varied across CETI items for each client, some patterns were observed within the group. As shown in Figure 11, caregivers did not observe change in attention. While attention was not necessarily expected to improve, attention is required to sustain conversation.

Improvements were reported in 1:1 conversations, group conversations, coffee and visits with friends, spontaneous communication, and conversations with strangers.

Figures 4-10  
*Individual Participant Data for the CETI*

Figure 4  
*Individual Participant Data for the CETI - Participant 2*

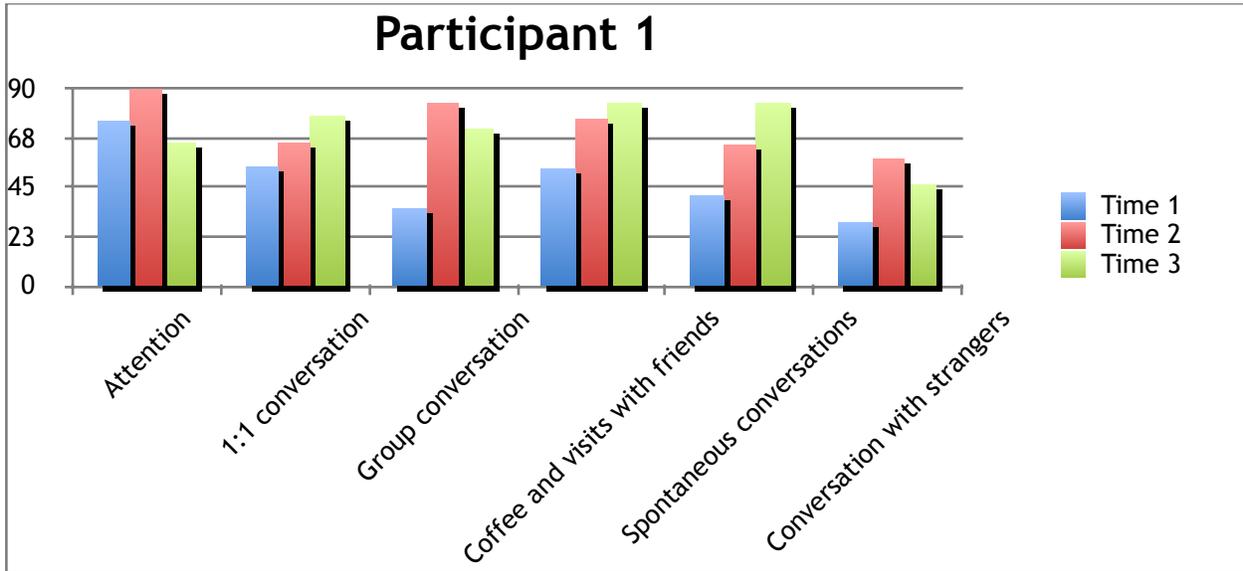


Figure 5  
*Individual Participant Data for the CETI - Participant 2*

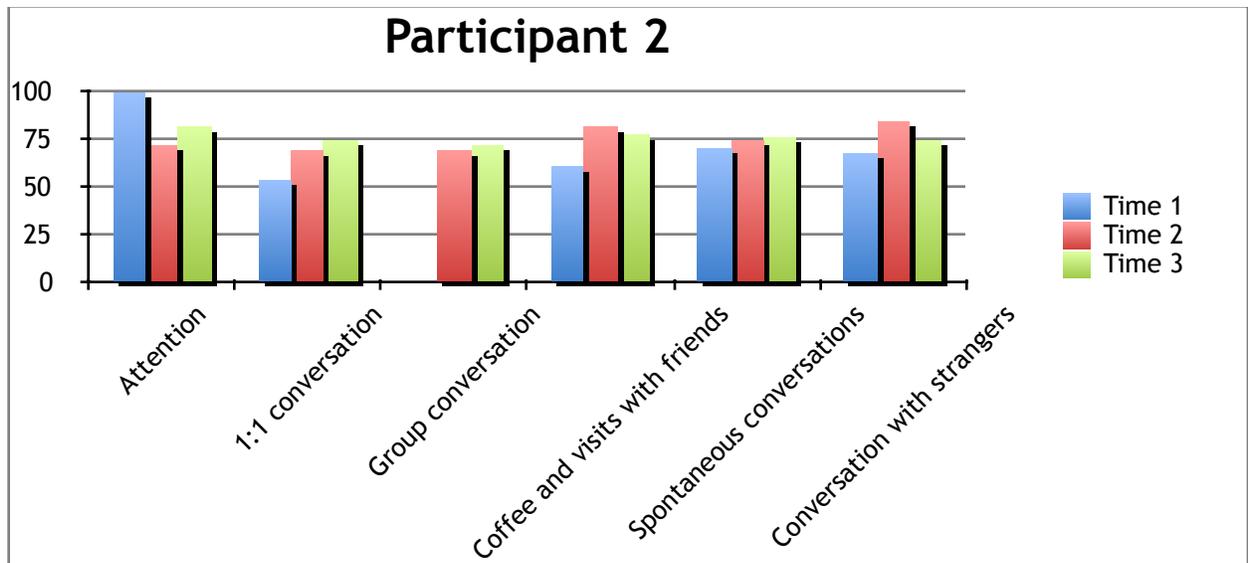


Figure 6  
*Individual Participant Data for the CETI - Participant 3*

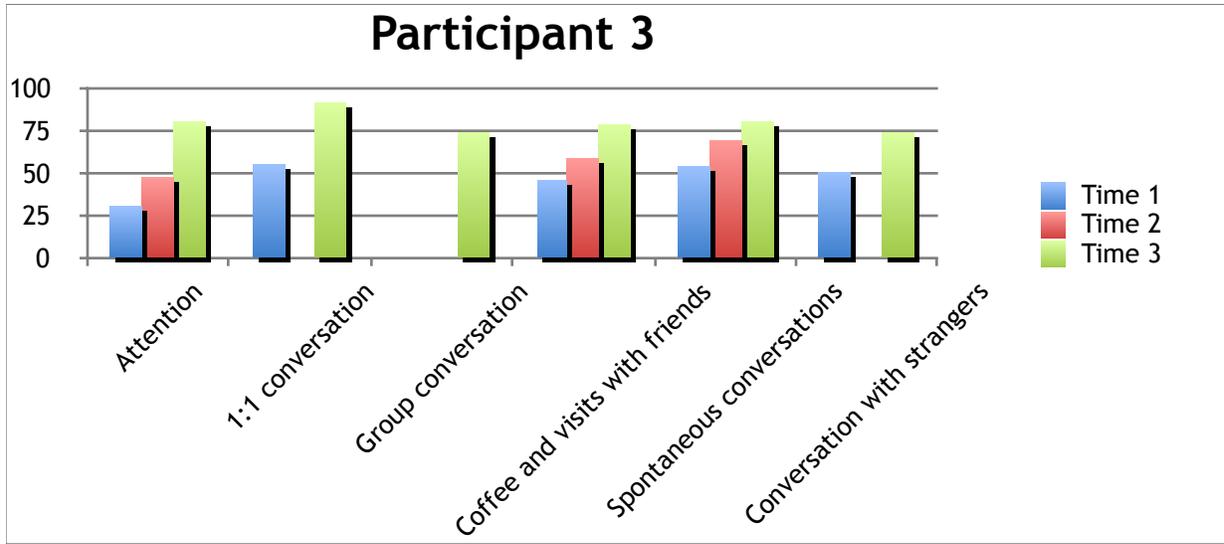


Figure 7  
*Individual Participant Data for the CETI - Participant 4*

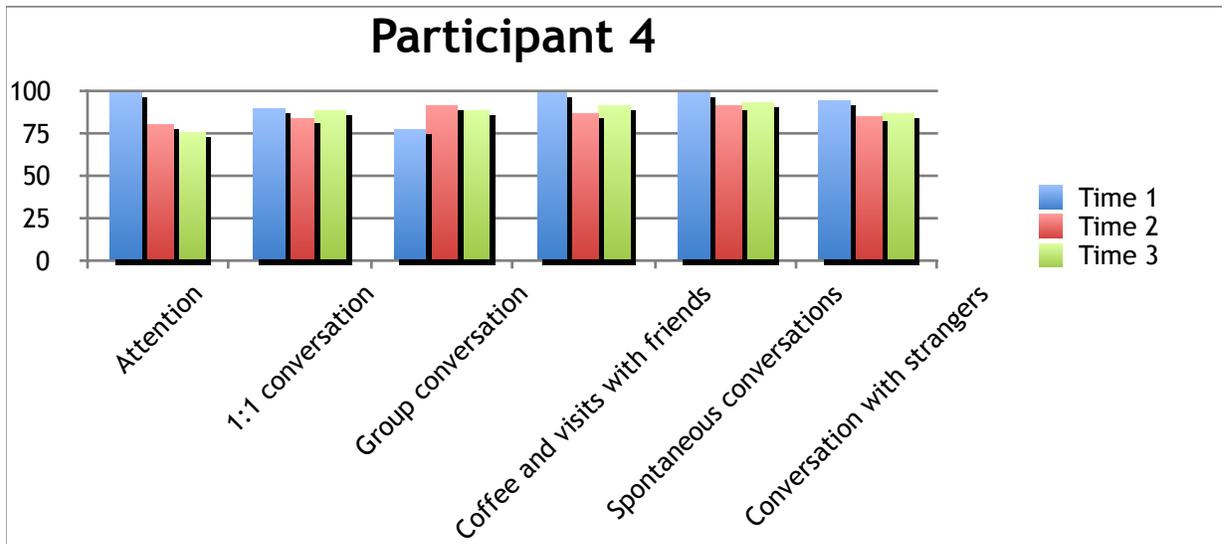


Figure 8  
*Individual Participant Data for the CETI - Participant 6*

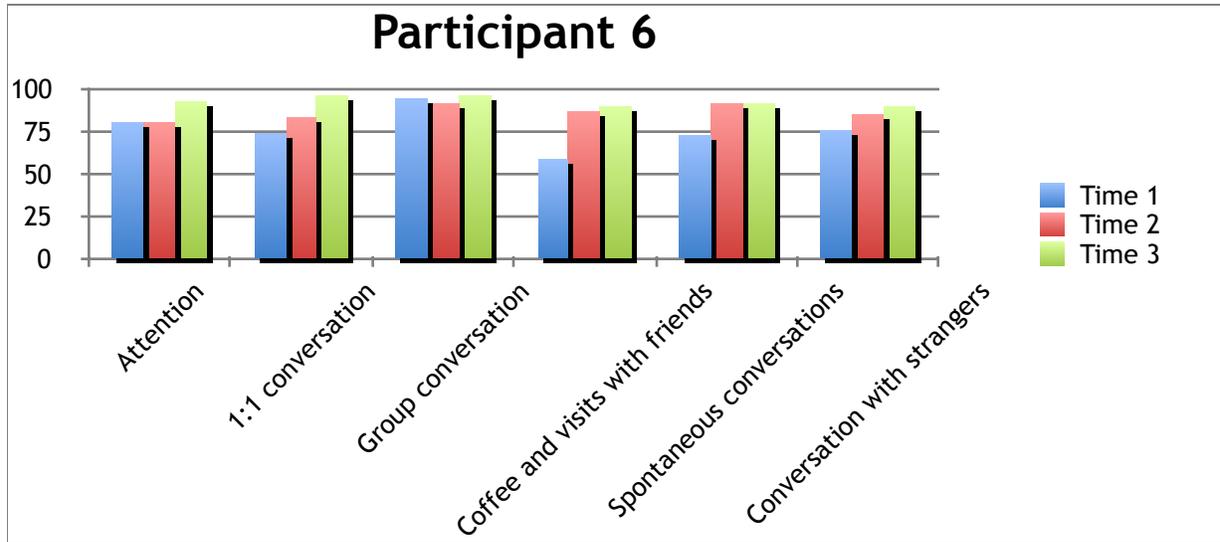


Figure 9  
*Individual Participant Data for the CETI - Participant 8*

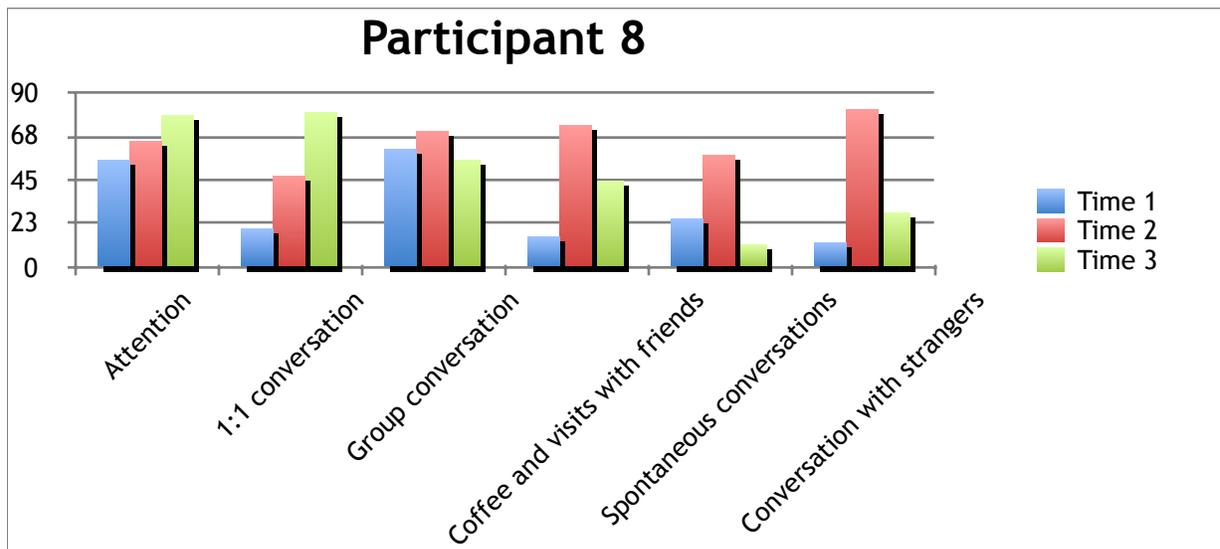


Figure 10  
*Individual Participant Data for the CETI - Participant 9*

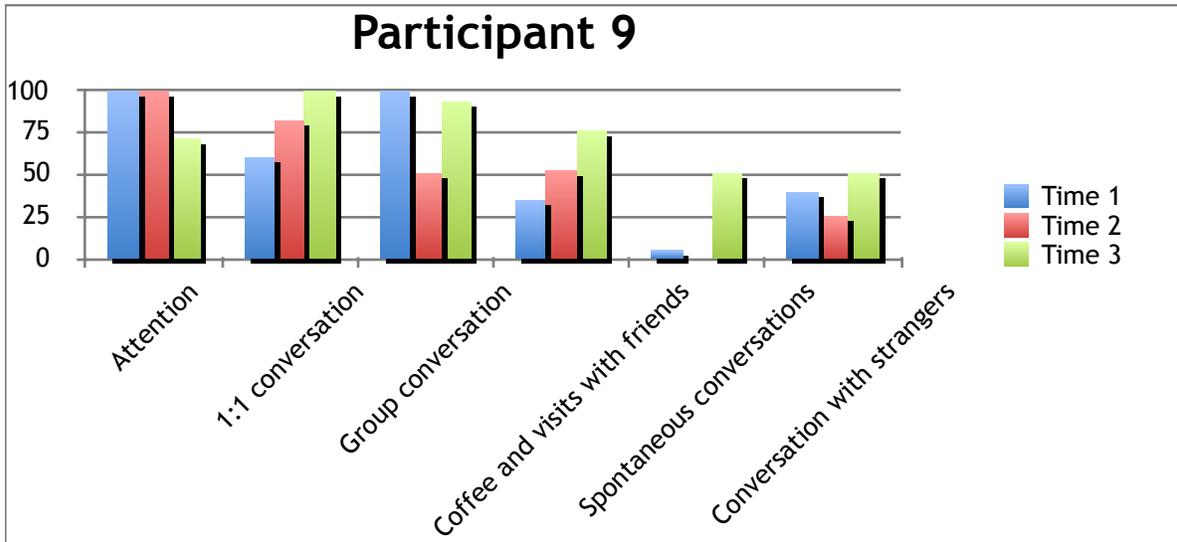
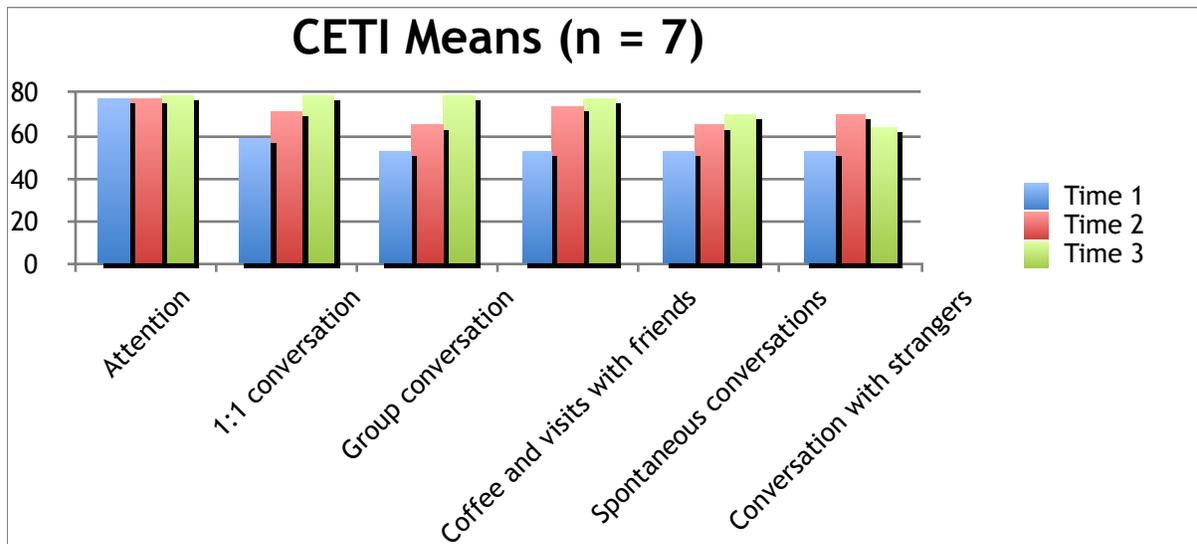


Figure 11  
*Group Participant Data for the CETI (n = 7)*



On the Social Network Analysis (Simmons-Mackie & Damico, 1996a, 2001) participants one, two, four, five, seven, eight, and nine all saw increases at each testing period after the initial social network analysis was completed. This means that the participants felt that the number of

people they interacted with weekly grew in number over the course of the semester. Participant three stated that he interacted with twenty-two people on average at the initial testing. His social network dropped to twenty people at mid-term, but his post-test increased to greater than the initial testing with a final result of twenty-five people. Thus, participant three's overall social network grew during the data collection period. Participant six experienced an increase in his social network from the pre-testing period to the mid-term period, but his network remained constant at post-testing. The results indicate the number of people he interacted with consistently on a weekly basis was twenty-three, a large number consistent with his mid-term findings. Overall, the trend from pre-test to mid-term to post-test was that each participant's social network increased in number from pre-testing to mid-term then increased from mid-term to post-testing. The results as demonstrated in Table 3 show that each participant's social network (i.e. the number of people he or she interacted with at least three times a week on a weekly basis) increased from beginning to end.

A Friedman test was run to determine if there were significant differences in pre-test, mid-term, and post-test scores. Pairwise comparisons were performed using SPSS Statistics version 23 and revealed a significantly different increase Bama Perks intervention ( $t = -7.05, p < .0005$ ).

Table 3

*Pre-Test and Post-Test Scores for the Social Network Analysis*

<u>Participant</u>	<u>Social Network Analysis Pre-Test</u>	<u>Social Network Analysis Mid-Term</u>	<u>Social Network Analysis Post-Test</u>
1	8	12	15
2	6	14	16
3	22	20	25
4	1	6	8
5	8	12	18
6	18	23	23
7	8	17	20
8	8	14	20
9	9	13	14
Average	10	15	18

On the Burden of Stroke Scale (BOSS), participant five's BOSS scores were not analyzed due to not being accurately reported. An overall score was provided, but sub-scales could not be analyzed. Participant one experienced a decrease in each of the sub-scales of the BOSS suggesting a decrease in burden of the diagnosis.

Participant two experienced a decrease in each of the sub-scales of the BOSS except for the communicative difficulty scale, which remained the same and overall shows a decrease in burden of the diagnosis.

Participant three experienced a decrease in each of the sub-scales of the BOSS except for

the negative mood scale revealing a decrease in burden of the diagnosis in terms of communicative abilities, communication-associate psychological distress, and overall positive mood feelings.

Participant four experienced a decrease in each of the sub-scales of the BOSS except for the communicative difficulty scale, which saw an increase, revealing an increase in subjective feeling about communicative abilities and also showing a decrease in burden of the diagnosis.

Participant six experienced a decrease in each of the sub-scales of the BOSS except for the negative mood scale, which saw an increase, revealing an increase in burden in subjective feeling but also showing a decrease in burden of the diagnosis concerning other scales.

Participant seven experienced a decrease in the communicative difficulty sub-scale and remained the same for the communication associate psychological distress scale. Participant seven experienced an increase in burden in the positive mood scale meaning the participant felt he did not experience positive moods as frequently as at the beginning of the semester.

Participant eight experienced a decrease in the sub-scales of communicative difficulty and positive mood scale. This means that the client saw a decrease in burden on her ability to communicate and an increase in amount of positive feelings. Her negative mood scale remained the same, and her communication associate psychological distress scale increased. The increase in the communication associate psychological distress scale reveals that the participant felt greater distress at the end of the data collection period than at the beginning.

Participant nine experienced a decrease in burden in the communicative difficulty scale and the communication associate psychological distress scale, and his negative mood scale remained the same. The positive mood scale score increased in burden for this participant.

Overall, each of the sub-scales decreased in burden when averaged over all participants. This shows that the participants as a whole tended to experience a decrease in the burden of their stroke or diagnosis, and the coffee shop played a role in these results.

A Friedman test was run to determine if there were differences in pre-test BOSS scores and post-test BOSS scores. Communicative difficulty scale scores decreased from pre- (*Mean* = 54.68), to post-intervention (*Mean* = 39.79), but the differences were not statistically significant ( $t = 2.027, p = .212$ ). Communication associate psychological distress scale scores decreased from pre- (*Mean* = 56.23), to post-intervention (*Mean* = 43.46), but the differences were not statistically significant ( $t = 1.59, p = .032$ ). Negative mood scale scores decreased from pre- (*Mean* = 38.29), to post-intervention (*Mean* = 29.87), but the differences were not statistically significant ( $t = 1.23, p = .12$ ). Positive mood scale scores decreased from pre- (*Mean* = 46.88), to post-intervention (*Mean* = 33.33), but the differences were not statistically significant ( $t = 1.16, p = .639$ ). Figure 3 and Table 4 summarizes the findings of the BOSS for pre-test and post-test scores.

Figure 3

*Pre-Test and Post-Test Scores Compared for the Burden of Stroke Scale (BOSS)*

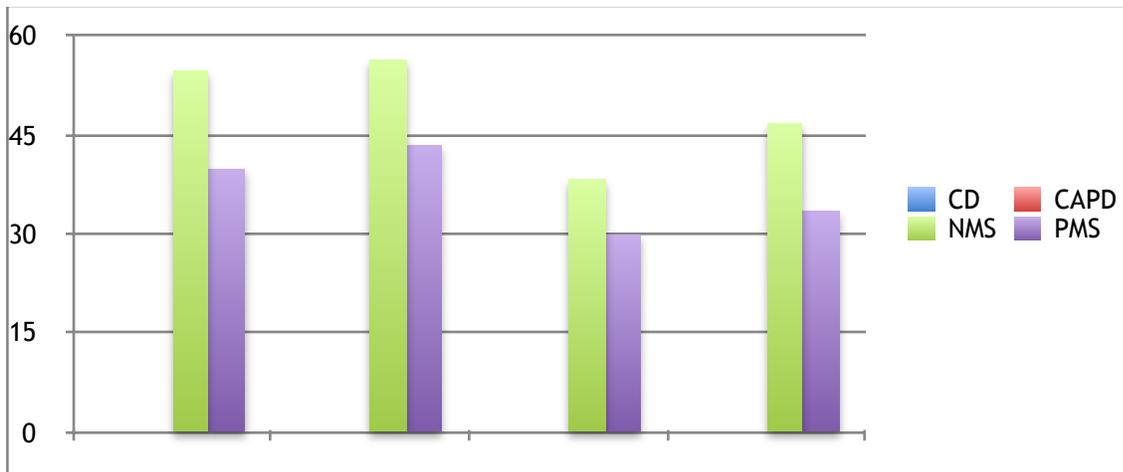


Table 4

*Pre-Test and Post-Test Scores with Mean and Standard Deviations for Burden of Stroke Scale (BOSS)*

<u>Participant</u>	<u>Communicative Difficulty Scale (CD)</u>		<u>Communication-Associate Psychological Distress Scale (CAPD)</u>		<u>Negative Mood Scale (NMS)</u>		<u>Positive Mood Scale (PMS)</u>	
1	75	58.3	41.67	50	43.75	12.5	62.5	68.75
2	37.5	37.5	58.3	41.7	50	37.5	62.5	37.5
3	58.3	54	50	41.6	18.75	31.25	68.75	25
4	25	41.67	83.3	33.3	50	12.5	50	12.5
5	X	12.5	X	25	X	25	X	12.5
6	58.3	45.8	75	58.3	56.25	62.5	62.5	43.75
7	62.5	25	0	0	0	0	0	25
8	75	58.3	83.3	91.2	43.8	43.8	43.8	25
9	45.8	25	58.3	50	43.75	43.75	25	50
Total Average	54.68	39.79	56.23	43.46	38.29	29.87	46.88	33.33

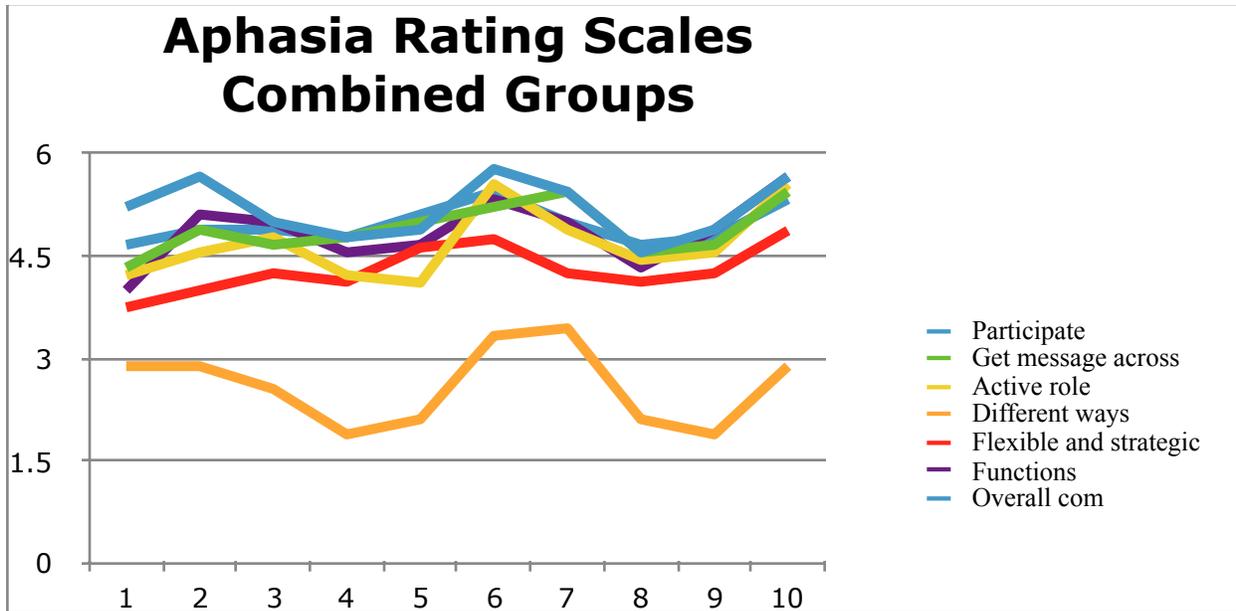
The Aphasia Group Conversational Competence Rating Scales (Sittner & Garrett, 1996) were completed each session. Each undergraduate research assistant and graduate clinician who interacted with the client completed a scale. The rating scale notes negative or positive changes in communication, functional ability, and social interactions. The scale consists of seven statements that the clinician or research assistant answered in regards to how the participant communicated that day.

Lots of variability was demonstrated within and across the group, as demonstrated in

Figure 12. Participants saw the highest ratings in regards to overall communication. The lowest ratings were seen in different ways in which the participants communicated, which is to be expected as most participants communicated through few modes by speaking or through a communication book with periodic use of writing. Participants tended to see the greatest rise in ratings by being flexible and strategic in the way they were able to communicate. In regards to getting a message across, the group of participants saw an increase from the beginning to end of the data collection period. Though the ratings on the participants for taking an active role as a communicative partner saw a dip in the semester, the trend at the end of the semester was greater than at the beginning of the semester. The ratings for the participants' communicative functions saw an overall increase from beginning of the semester to the end, even with variability in the middle of the data collection period.

Figure 12

Group Participant Data for the Aphasia Rating Scales with Combined Groups



## CHAPTER 4

### DISCUSSION

The Bama Perks intervention was implemented with nine individuals with aphasia to measure feasibility of a simulated social environment as an intervention model and to describe participants' experiences and skills before and after intervention. All nine participants showed gains in the WAB-R scores, which measures speech production, auditory comprehension, reading comprehension, and writing. It is possible that the increase on WAB-R scores was due to the practice effect; however, research suggests the ten week time frame may be long enough to be outside this effect due to its high test-retest reliability (Olsen, Pederson, & Vinter, 2001). Gains for all participants were also reported by caregivers on the CETI, which measured clients' growth in the areas of attention, one to one conversation, group conversation, coffee and visits with friends, spontaneous conversations, and conversations with strangers. The Attention domain did not change, but all other domains increased from pre- to post-intervention.

The social network analysis saw gains from the beginning of the semester to the end across the group of participants as a whole; however, individual gains could be seen during the data collection period. This could be due to interactions with peers at the coffee shop, decrease in personal feeling of burden of the diagnosis, and a boost in confidence during the semester of the data collection. The coffee shop truly served as a community building environment where clients could encourage each other, especially during conversation to "take their time" when speaking.

The context created a bonding experience between clients that normally would not have been there as seen in the testimonials of participants. Participants began to include each other's names on their own Social Network Analyses and attributed their taking steps back to normal daily activities to the confidence they received from the time at Bama Perks. It is important to note the interactions amongst the participants and how even the youngest were encouraging the oldest, with a 30 year age gap.

The BOSS revealed that overall the group of participants saw a decrease in each of the sub-scales. Along with this decrease, the participants shared personal stories of how their time at the coffee shop had encouraged them to initiate interactions with strangers and take steps back into premorbid activities and how they felt that being with others who shared their difficulties gave them a sense of belonging.

Feasibility of the coffee shop was assessed through the gains seen in participants and the completion of the project. Each client's individual story of success and quality of life improvements demonstrated the goals set to achieve - that the natural environment was possible and effective as a means of therapy for improving client's language skills and overall confidence in life. Contributing to emerging research of generalized contexts in conjunction with other therapy approaches as seen in Hinckley and Holland's works, this research has laid a foundation for further work in naturalized settings and specifically Bama Perks (Boles & Lewis, 2003, Carr, Hinckley, & Patterson, 2001, Davidson, Hickson, & Worrall, 2003, Holland, 1991).

## **Limitations**

This study was limited by its small sample size. A control group was chosen not to be a part of the study design due to the small sample size. Another limitation occurred with the missing data from two participants.

## **Future Research**

Future research is needed to investigate further the use of the coffee shop as a setting, which allows for the generalization of therapy and as a context to build social communication while decreasing client burden. Continued research at the Bama Perks coffee shop will serve as a way to increase subject number in data collection and help improve the reliability and validity of the research.

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