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EFFECT OF GROUP APHASIA TREATMENT ON
WORD RETRIEVAL SKILLS

A Thesis

Submitted to the Graduate Facility of the
Louisiana State University and
Agricultural Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Arts

in

The Department of Communication Sciences and Disorders

by
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ABSTRACT

The present single subject study investigated the treatment effects of group aphasia treatment (GAT) on word retrieval skills. Two participants participated in 1.5 hours of GAT, two times a week for 17 sessions. Both participants demonstrated significant improvements in percent of correct responses, but theses gains were not maintained. Slight improvements were noted on the *Boston Naming Test* (BNT; Kaplan et al., 2001) in one participant, but not the other. Both participants demonstrated improvement in discourse as evidenced by percent correct information units (CIUs; Nicholas & Brookshire, 1993) and in functional communication abilities as evidenced by the ASHA Functional Assessment of Communication Skills (ASHA FACS; Frattali et al., 1995) Social Communication Subtest. One participant demonstrated improved quality of life Based on the *ASHA Quality of Communicative Life Scale* (Paul et al., 2004) ratings. Results indicated that total time in treatment did not affect improvement. Results indicate that GAT was successful in the treatment of word retrieval but these skills did not generalize to untrained activities and were not maintained.

LITERATURE REVIEW

Aphasia treatment has typically targeted linguistic and communication deficits in an individualized clinical setting (Elman, 2007). Treatments of this nature yield clinical improvements but patients lack generalization to other communicative environments, such as home, work, and community (Lyon, 1992; Kearns, 1989; Thompson, 1989). Elman (2007) proposes three advantages of group aphasia treatment (GAT). First, group treatment offers a more natural communicative setting, incorporating multiple conversational partners and opportunities for the development of pragmatic skills. In addition to the benefits of an authentic communicative environment, group treatment contributes to gains in psychosocial functioning by providing a supportive and receptive environment for communication. Lastly, GAT reduces the financial obligation, allowing the cost to be distributed among group members. The current study was initiated to determine whether or not there was a treatment effect of multipurpose GAT on word retrieval skills and connected speech of persons with aphasia (PWA).

The background for this proposal is broadly divided into three sections that will lead to establishment of the study's experimental questions. First we will define aphasia and describe the communication disorders associated with it putting the emphasis on anomia (i.e., impairment of word retrieval). Since anomia is the most common residual of aphasia, regardless of aphasia type (Goodglass & Wingfield, 1997), we will review the literature as it relates to how anomia affects communication, and how PWA are rehabilitated. Second we will describe the various types of group therapy approaches and the state of the art in GAT. Third, we will discuss how using the World Health Organization (WHO) International Classification of Functioning, Disability, and Health (ICF; WHO, 2001)—a rehabilitation model, lends credence to the study of

GAT from the perspectives of the impairment, activity limitation, and participation restrictions that often result from aphasia.

Aphasia

Aphasia is "a disruption in using and understanding language following neurological injury or disease that is not related to general intellectual decline or sensori-motor deficits" (Murray & Clark, 2006). Stroke or cerebral vascular accident (CVA) is the most common cause of aphasia. Aphasia may also be caused by accident, tumor, infection, toxicity, and metabolic and nutritional disorders. Deficits will vary between individuals and due to the location and severity of the injury (Shipley & McAfee, 2004). Aphasia disrupts several language processes, including comprehension, fluency, naming, and repetition (Murray & Clark, 2006). Almost all PWA experience word finding problems or anomia (Goodglass & Wingfield, 1997; Davis, 2000; Boyle & Coelho, 1995). In fact, for some individuals difficulty retrieving words is their primary deficit, resulting in restricted activities of daily life and participation in completing life roles (Marshall & Freed, 2006; Deloche, Dordain, & Kremin, 1993; Goodglass & Wingfield, 1997).

Anomia

Anomia is manifested as a result of underlying impairments of semantic representation, lexical access, phonological representation, and phonologic processing (Murray & Clark, 2006). Anomia is characterized by difficulty recalling words or names and may be observed through paraphasias, neologisms, jargon, and circumlocutions. Semantic paraphasias consist of word choice errors (e.g. sock for shoe); while phonemic paraphasias consist of sound errors (e.g. free for tree). Circumlocutions occur when an individual uses descriptions, definitions, or sounds to convey target words (e.g. box that keeps food cold for refrigerator). Finally, neologisms are the result of non-word production (e.g. jazzlepam). Jargon is a more severe word retrieval deficit in

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which the speech produced is full of neologisms (Murray & Clark, 2006). Many different approaches for treating anomia exist. Research indicates that a variety of approaches yield positive results (Marshall & Freed, 2006; Nickels, 2002).

Wambaugh et al. (2001) studied three individuals with varying levels of lexical processing impairment and noted that all the participants responded positively to both semantic treatment and phonologic treatment. Wambaugh hypothesized that "the process of lexical access is interactive to such a degree that either type of treatment may benefit all levels of processing" (p. 947).

In 1989, Hillis studied the use of a cueing hierarchy, relying primarily on graphemic and phonologic cues in the treatment of word retrieval. The study utilized a single subject design and reported generalization in one of two subjects. Hillis (1993) also studied the effects of semantic treatment and phonological treatment on word finding abilities. Both semantic and phonological treatments resulted in participant improvement in word retrieval. Hillis concluded that a combination of semantic and phonological approaches provides the best treatment (Hillis, 1993). Boyle and Coelho (1995) utilized semantic feature analysis in the treatment of word retrieval, providing semantic information when needed. The treatment also resulted in generalization to untrained items, leading them to conclude that multiple treatment methods can result in improved word finding abilities (Boyle & Coelho, 1995). Taken together this evidence indicates that the most effective treatment incorporates a variety of cues, incorporating graphemic, phonologic, and semantic approaches.

While research shows that word retrieval treatment is clinically effective, evidence of generalization to discourse is lacking. Boyle & Coelho (1995) studied an individual with mild nonfluent aphasia, using a single subject design. The subject received treatment, focusing on

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semantic feature analysis three times a week for one hour. Results indicated improved naming on both trained and untrained items but no generalization to connected speech. Due to the lack of improvement in discourse, they hypothesized that future treatment should directly address connected speech. Coelho, McHugh, and Boyle (2000) replicated the study, utilizing semantic feature analysis in the treatment of an individual with moderate fluent aphasia. Results paralleled the previous study, resulting in gains in trained and untrained confrontational naming. However, in the replication study, results revealed modest improvements in discourse.

The studies cited above provide evidence for the benefit of individual anomia treatment both in naming tasks (impairment level), and in connected speech. However, similar research has not been done administering anomia treatment to PWA in GAT.

<center>Group Aphasia Treatment</center>

The importance of integrating clinical treatment into natural communicative settings has been described in the literature. Lyon (1992) proposes that treatment should first address the communication deficits associated with aphasia, followed by integration into natural settings. Rosenbek, LaPointe, and Wertz (1989) describe a three-step approach for the treatment of word retrieval in connected speech, consisting of diagnosis, strategy development and practice, and stabilization and generalization in less structured communicative environments. The multiple members in GAT and the flexibility within activities provide a natural environment for the generalization of previously learned compensatory strategies. Group therapy following individual therapy can address connected speech and provide PWA an introduction to more natural communicative settings.

According to Elman and Bernstein-Ellis (1999), group treatment "facilitates generalization of functional communication to natural environments" (p. 412). Research

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confirms that GAT mirrors everyday communicative events by utilizing a variety of discourse management features. These features included "establishing the feeling of discourse equality, focusing on everyday communicative events and genres, employing multiple communication modes, mediating communication, calibrating corrections, aiding turn allocation, and judiciously employing teachable moments" (p.18, Simmons-Mackie et al., 2007). A group setting creates a supportive environment, reducing stress and providing an opportunity for peer assistance and modeling. The various members provide each participant with multiple communication partners and opportunities for the use of multimodalities in a natural communication setting (Simmons-Mackie & Damico, 2009; Marshall, 1993).

Group treatment is a broad classification that includes psychosocial groups, family counseling and support groups, speech-language treatment groups, and multipurpose groups. Psychosocial groups focus on providing participants with a social atmosphere that provides support and understanding to aid in management and acceptance of aphasia (Kearns & Elman, 2001). Family counseling and support groups provide education about a given disorder or disease process as well as an outlet of support to participants during a time of changing life roles (Brookshire, 1997). Specific to aphasia treatment, groups can be structured to provide direct, indirect, sociolinguistic, transitional, or maintenance training (Kearns and Elman, 2001). Multipurpose groups encompass a variety a goals, such as language stimulation, social goals, emotional support, and carryover. According to Kearns and Simmons (1985) survey of Veterans Administration Medical Centers regarding GAT, 80% of groups can be classified as multipurpose groups. Multipurpose groups can provide a variety of treatment, such as graphemic, phonologic, and semantic approaches. A combination of approaches was found to be efficacious for individual treatment (Wambaugh, 2001; Boyle & Coelho, 1995; Hillis, 1993).

Based on this evidence, we would suspect that a combination of approaches would be most effective in the group setting as well. However there is no direct evidence of such a study, therefore, the question remains to be answered.

Wertz, Collins, Weiss, et al. (1981) examined the efficacy of GAT in contrast to individual treatment. Participants were randomly assigned to each group and received 8 hours of the assigned therapy weekly. Group therapy focused on facilitating language in group discussions and did not directly address individual linguistic skills. Results indicated that both groups demonstrated significant improvement on all measures. Researchers concluded that individual treatment was slightly more effective due to significantly better performance on the Porch Index of Communicative Abilities (PICA; Porch, 1967, 1973) by the individual treatment group. All other measures did not indicate a significant difference between individual and group treatment. Researchers urged therapists to consider GAT due to the cost effective advantages.

Bollinger, Musson, and Holland (1993) used a treatment/withdrawal design to examine the efficacy of group treatment. Participants with chronic aphasia received group treatment for 3 hours a week for two sets of 20 weeks. Participants received 20 weeks of Contemporary Group Treatment and 20 weeks of Structured Television Viewing Group Treatment. Contemporary Group Treatment focused on day-to-day communication, consisting of greetings and socialization, a core activity based on a real-life occurrence, and specific communication related activities. Structured Television Viewing Group Treatment focuses on enhancing comprehension and expression of television programs. Participants demonstrated improvement on the Communicative Abilities in Daily Living (CADL; Holland 1980) and PICA (Porch, 1967, 1973) after treatment and throughout the withdrawal periods. Participants did not demonstrate improvement on a measure of auditory comprehension. These results indicate improved

communication skills, consistent with the focus of treatment, encouraging participants to communicate in any modality, as long as meaning was conveyed.

Elman and Bernstein-Ellis (1999) studied the efficacy of group aphasia communication treatment in 24 participants with chronic aphasia. The subjects were divided into two groups: immediate treatment and delayed treatment. Groups were matched for age, education level, and time post-onset. Treatment was provided over 4 months for 2.5 hours, twice a week with two 30-minute social breaks each session. Group treatment focused on multimodality communication, improving initiation of conversation, educating on aphasia, improving self-confidence, and increasing self-awareness of goals and progress. Individuals in the delayed treatment group participated in three or more hours of social group activities a week. Clinically significant progress was noted on the Shortened Porch Index of Communicative Abilities (SPICA; Disimoni et al., 1980), Western Aphasia Battery Aphasia Quotient (WAB AQ; Kertesz, 1983), and the CADL (Holland 1980). Results indicated a pattern of improvement over time and gains were maintained one-month post-treatment. The delayed treatment group did not demonstrate clinically significant changes between intake and pretreatment, indicating that improvement was not due to socialization. Based on the improvement of the treatment group and lack of improvement of the delayed treatment group prior to treatment, this study demonstrated GAT yielded a positive treatment effect.

Van der Gaag et al. (2005) examined the impact of a community-based aphasia program. Persons with aphasia attended therapy 1-2 times per week (average of 1.7 hours) for 6 months. Group activities focused on conversation, communication skills, and advocacy. Qualitative and quantitative assessments included the Communicative Effectiveness Index (CETI; Lomas et al., 1989), caregiver assessment using Carer's Assessment of Difficulties Index (CADI; Nolan &

Grant, 1992), two quality of life measures, and an interview. Quality of life measures were the EuroQol (EuroQol Group, 1990) and the Stroke and Aphasia Quality of Life Measure (SAQoL-39; Hilari et al., 2003). The SAQoL-39 was administered to assess physical, psychosocial, communication, and energy. Statistically significant results were indicated on the CETI (Lomas et al., 1989) and the EuroQol quality of life measure (EuroQol Group, 1990). This is one of the few studies that has attempted to measure change in quality of life in GAT.

Simmons-Mackie and colleagues (2007) examined the management of discourse in GAT through the review of six group treatment sessions. Using a qualitative study, the authors defined "social" group therapy through seven categories of clinical discourse. The authors discuss the benefits of group therapy, indicating that group therapy builds confidence necessary to communicate in natural social environments. Their analysis revealed that group therapy provided participants with experience with a variety of communicative strategies and opportunities to practice communicative problem solving and repair.

In addition to communicative gains, group treatment may be financially beneficial for PWA, in that the cost for one hour of treatment may be distributed across several clients, thus reducing the cost to each individual. Elman (1998) suggested that group treatment offered a cost effective alternative for continuing services in this time when reductions in the intensity, frequency, and duration of treatment are the rule rather than the exception due to trends in managed care. In addition, group treatment offers individuals with aphasia a realistic option for long-term rehabilitation. The costs associated with this form of therapy are comparable to other life enhancing expenditures, such as a gym membership or continuing education classes (Beeson & Holland, 2007).

ICF Model for Rehabilitation

Because the ultimate outcome of communication therapy is to improve an individual's communicative effectiveness in daily interactions needed to fulfill life roles, it has become increasingly important for clinical aphasiologists to incorporate goals into their treatment regime that address "participation in life roles" (ASHA, 2001; Kagan & LeBlanc, 2002; Lyon, 2000). In fact, the American Speech-Language-Hearing Association (ASHA) Scope of Practice for Speech-Language Pathology (ASHA, 2001), has recommended using the WHO ICF (WHO, 2001) as a framework for the assessment and treatment of individuals with neurogenic language disorders so that assessment and treatment address the gamut of difficulty that may be encountered by individuals with communication disorders.

The main benefit of using the ICF is that it allows both clinicians and researchers a framework within which to identify the complexities that surround recovery from illness and rehabilitation of abilities. The ICF focuses on three main components: body function/structure, activity, and participation. Body function/structure incorporates the current level of function due to disease or injury. Activity addresses the individual's ability to complete distinct tasks or actions. Participation describes an individual's ability to complete life roles (i.e. what those in behavioral sciences have typically called generalization of trained behaviors into real world situations). The ICF model accounts for environmental factors that influence the magnitude of the effect of structural deficits on activity and participation. Evidence confirms that due to individual differences, such as environmental factors, improvement in one domain does not always generalize to other domains (Brandt & Pope, 1997; Jette, 2003; Keysor & Jette, 2001). This lack of generalization inhibits participation. The motivation for GAT is that social elements, such as those associated with group therapy, will facilitate communicative generalization and

maintenance (Lyon, 1992).   Generalization contributes to the success of treatment beyond the clinical setting, improving participation.

<center>Quality of Life</center>

One important consideration that is not included in the ICF is quality of life. Most people directly relate their quality of life to their communicative abilities (Saloman, Vestrager, & Jahd, 1988). Ross, Winslow, Marchant, and Brumfitt (2006) studied seven people with chronic aphasia over the course of treatment for two hours a week for eleven weeks. Participants demonstrated improvements in conversational experiences and abilities and improvements in psychological well-being. With regard to GAT, we have anecdotal evidence of improved quality of life (Elman & Bernstein-Ellis, 1999; Holland & Beeson, 1999; Kearns & Elman, 2001) but no measurable results. Since the cited reports were published, the ASHA *Quality of Communicative Life (QCL) Scale* has become available to assess an individual's quality of communicative life (Paul et al., 2004). Therefore it is now possible to assess whether or not GAT has an effect on PWA's quality of life. Again, one of the motivations for GAT is that through improved communicative participation an individual's quality of life will be improved. However, at this time that is an empirical question that must be answered.

The present study was undertaken to determine if multipurpose GAT whose stated purpose is language stimulation, socialization, and emotional support, has a treatment effect on word retrieval skills and generalization to connected speech. We asked the following research questions:

1. Is there a treatment effect for multipurpose GAT administered for 1.5 hours per session, 2 times per week for 17 sessions?

2. Does the participant demonstrate improvement on:

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a. naming skills based on comparison of pre- and post-treatment *Boston Naming Test* (Kaplan et al., 2001) scores?

b. connected speech production based on comparison of pre- and post-treatment *Correct Information Units* (Nicholas & Brookshire, 1993)?

c. functional communication skills based on comparison of pre- and post-treatment *ASHA Functional Assessment of Communication Skills* (Frattali et al., 1995) scores?

d. quality of communicative life based on the *ASHA Quality of Communicative Life* (Paul et al., 2004) scores?

3. Is there a difference in the amount of change each participant demonstrated relative to his/her total time in treatment?

METHODS

This was a prospective, multiple single-subject study on the treatment effect of multipurpose GAT for participants with chronic aphasia. The Louisiana State University (LSU) Institutional Review Board for the protection of the human subjects approved the study proposal prior to enrollment of subjects or data collection. Participants received informed consent before any data were collected in the study.

Subjects

Two subjects were recruited into the study based on the following inclusion criteria: (1) aphasia as determined from medical records, (2) native English speaker, (3) functional hearing as determined by the Screening Version of the Hearing Handicap Inventory for the Elderly (HHIE-S, Ventry & Weinstein, 1983), and (4) corrected or uncorrected visual acuity of 20/100 in the better eye on visual screening using the Snellin Eye Chart. Subjects were excluded from the current study due to (1) facial paresis, (2) dementia, (3) psychiatric illness, and (4) degenerative nervous system illness as determined by the Mini Mental State Exam (MMSE; Folstein, et al., 1975).

Design

This study examined the effects of multipurpose GAT on two subjects. To answer the experimental questions, the study investigated the effect of group treatment on anomia, improved connected speech, generalization, and quality of life. This study utilized a single-subject ABAA research design. The dependant variable was percent correct responses on specified word retrieval tasks. Secondary outcome measures administered pre- and post-treatment, and at follow-up included the *Boston Naming Test* (BNT; Kaplan et al., 2001), Correct Information Units (CIUs) using single pictures and picture sequences (Nicholas & Brookshire, 1993), *ASHA*

Functional Assessment of Communication Skills for Adults (ASHA-FACS; Frattali et al., 1995)

Social Communication sub-test, rated by caregiver (Donovan et al., 2006), and ASHA-QCL

Scale (Paul et al., 2004).

All of the secondary outcome measures chosen had established validity and reliability.

The BNT (Kaplan et al., 2001) is widely used as a supplemental aphasia assessment to

specifically assess anomia. Research indicates that the BNT is reliable, exhibiting acceptable

score stability (Flanagan & Jackson, 1997). The CIU provides stable baseline information,

providing a comparison for changes in connected speech with treatment (Nicholas & Brookshire,

1993). Additionally, connected speech tasks are an effective measure of activity limitation (Ross

& Wertz, 1999). The ASHA-FACS is a valid and reliable assessment of generalization to

functional communication for PWA (Frattali et al., 1995); and more recently Donovan and

colleagues (2006) demonstrated that caregivers rated PWA reliably on the ASHA-FACS Social

Communication Subtest. The ASHA-QCL (Paul et al., 2004) measures communication-related

quality of life. The ASHA-QCL standardization sample included individuals with aphasia

(fluent and nonfluent), Traumatic Brain Injury, cognitive-communication disorders related to

right-sided CVAs, and dysarthrias (Eadie et al., 2006). Using mean Pearson correlations, the

ASHA-QCL Scale showed a moderate test-retest reliability ($r = 0$ .63; Eadie et al., 2006).

Although the test-retest reliability is as robust as that achieved on impairment-level assessments,

it is the only instrument of its kind that is available at this time.

Procedures

The study was conducted at the LSU Speech, Language, and Hearing Clinic (LSU

SLHC). Second-year speech language pathology student-clinicians, supervised by a certified

speech-language pathologist (SLP) with over 20 years of experience, developed and

administered the treatment. The study was completed in the following manner. Prior to

treatment, participants received pre-treatment assessment as specified above. Pre-treatment

baselines were established over two days (A Phase 1) and then the participants began GAT (B

phase). Participants participated in 1.5 hours of treatment, two times a week for 17 sessions,

followed by one session of post-testing (A Phase 2). Following post-testing, a seven-week

maintenance phase (A Phase 3) commenced. During this phase, study participants did not

receive GAT, but followed a prescribed homework plan in which they were asked to engage in

five minutes of conversation per day. Participants recorded topic of conversation, conversation

partner, and rated their performance on a record sheet. After seven weeks, participants returned

to the clinic and completed follow-up assessment using a therapy task similar to one the subject

participated in during the treatment phase

Student-clinicians were encouraged to utilize activities including Promoting Aphasic

Communicative Effectiveness (PACE) tasks (Davis & Wilcox, 1981), role playing and

simulations, stating opinions and problem solving, current events discussion, and games as

suggested by Beeson and Holland, 2007. For example, a PACE activity may have involved

group members in communicating the name of a famous person to one group member until the

unknowing group member correctly guessed. Role playing and simulation activities were used

to rehearse functional tasks, such as ordering at a restaurant focused on upcoming group outings.

Other activities involved presenting a problem or situation to the group and eliciting their

opinions on a solution to the problem.   Current event discussions were led by student-clinicians

to reflect the interests of group members. Each activity required participation of every group

member and encouraged group members to utilize a variety of modalities to communicate. See

Appendix for a complete list of recommended activities.

Clinicians utilized a cueing hierarchy to facilitate correct responses. The following hierarchy was adapted from a nine step cueing hierarchy designed by Rosenbek, LaPointe, and Wertz (1989). The hierarchy is arranged from least to most powerful cue.

(6) No cueing required

(5) Responsive cueing, using functional or descriptive statements (It is used for shaving; it has a metal blade.)

(4) Embedding cueing, word is embedded in a sentence (You use a _____ for shaving.)

(3) Synonyms/Antonyms cueing

(2) Open-ended sentences/Automatic completions cueing (You shave with a _____; A straight-edged _____.)

(1) Phonemic cueing

(0) Repetition

The Primary Investigator (PI) trained the student-clinicians to use the cueing hierarchy prior to the start of treatment. The PI recorded the level of cueing required to produce a correct response, defined as a verbal or written response.

Responses were scored using a four-point scale. All scoring was completed by the PI. If the client was cued to write a response, this was not recorded, as it does not cue retrieval, only prompts communication.

(3) Correct immediate response

(2) Phonemic error, semantic error, insufficient information, or self-correction

(1) Incorrect response

(0) No response

The scores were averaged for each treatment session. Data collection began 30 minutes after the start of each session, to allow for personal stories and additional time for group members to arrive.

Two randomly selected videotapes were re-scored by the PI to establish intra-rater and inter-rater reliability. The PI trained the second rater (another second year SLP student-clinician who had not participated in the study) to score the responses to establish inter-rater reliability.

<div align="center">Data Analysis</div>

Experimental questions were answered using visual inspection of the single-subject data collected during pre-treatment assessment and post-treatment assessment, comparing baseline measures with treatment measures. The treatment effect size for GAT was determined by comparing baseline variance with maintenance variance per the procedures delineated by Beeson and Robey (2006). Effect size was calculated using:

$$\frac{(\text{Mean}_{A2} - \text{Mean}_{A1})}{\text{Standard deviation}_{baseline}}$$

Data were analyzed two ways because to date, one single way of analyzing single subject design data has not been clearly established as superior over another (Kendall et al 2008). Changes in secondary outcome measures are reported descriptively due to small sample size.

RESULTS

Two participants were recruited into the study. The first subject was a 60-year-old Caucasian female with non-fluent aphasia. To preserve confidentiality, she will be referred to as "Non-fluent." She suffered a left hemisphere CVA in May of 2000, resulting in right side hemiparesis and severe non-fluent aphasia. She has received eight years of treatment, including seven years individual and group treatment at the LSU SLHC. Prior to this study, her speech was characterized by anomia, perseverations, and apraxia of speech. Based on the Boston Diagnostic Aphasia Examination (BDAE) Aphasia Severity Rating Scale (Goodglass et al., 2001), she requires assistance conversing about familiar topics, sharing the burden of communicating with the listener. This rating is a 2 on a scale from 0 to 5, with a rating of 0 indicating no speech or auditory comprehension and 5 indicating speech handicaps that are not apparent to the listener. She attended 16 of the 17 treatment sessions.

The second subject was a 62-year-old Caucasian male diagnosed with fluent aphasia as a result of a left hemorrhagic CVA in May of 2005. He will be referred to as "Fluent"." He received individual speech therapy for three months prior to the start of treatment at the LSU SLHC. Since then he has attended individual and/or group therapy for three years at the LSU SLHC. At the conclusion of his most recent treatment, he demonstrated anomia with speech characterized by perseverations, jargon, paraphasias, and agrammatism. Based on the BDAE Aphasia Severity Rating Scale (Goodglass et al., 2001), he requires minimal or no assistance in daily conversational speech, but demonstrates difficulty or an inability to communicate complex ideas. This rating is a 3 on the Aphasia Severity Rating Scale. He attended 17 of 17 treatment sessions.

Experimental Questions

1. Is there a treatment effect for multipurpose GAT administered for 1.5 hours per session, 2 times per week for 17 sessions?

In single subject design, effect size compares mean scores in treatment to mean scores at baseline relative to baseline standard deviations (Kromrey & Foster-Johnson, 1996). During baseline assessment, Fluent's responses averaged 54% accuracy. Following 17 treatment sessions, Fluents's responses averaged 56% accuracy. Results revealed a medium effect size (d = .476) (Robey et al., 1999). Additionally, improvements over the course of treatment were not maintained. The effect size was calculated comparing mean scores after the maintenance period (A Phase 3) to means scores at baseline (A Phase 1) relative to baseline standard deviations. The results specify an effect size of -.48, indicating a medium negative effect size.

With regard to estimated probability of difference, Fluent's percent correct responses over the course of treatment improved to levels higher than his baseline average (.54) in nine out of his seventeen treatment sessions. The probability that percent correct would have fluctuated higher than the baseline average was calculated (p = .685). These improvements are not statistically significant.

Non-fluent baseline data yielded a mean percent correct of 46%. Post-testing assessment revealed a mean percent correct of 51%. Analysis revealed a large effect size (d = .625) (Robey et al., 1999). Nonfluent's improvements were not retained during the maintenance phase. Effect size comparing baseline and maintenance means, indicate an effect size of 0.00.

Nonfluent's percent correct responses over the course of treatment were higher than her baseline average (.46) in six out of her sixteen treatment sessions. Probability was calculated to

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determine if these points of improved accuracy were related to chance. Based on *p* = .227, these improvements are not statistically significant.
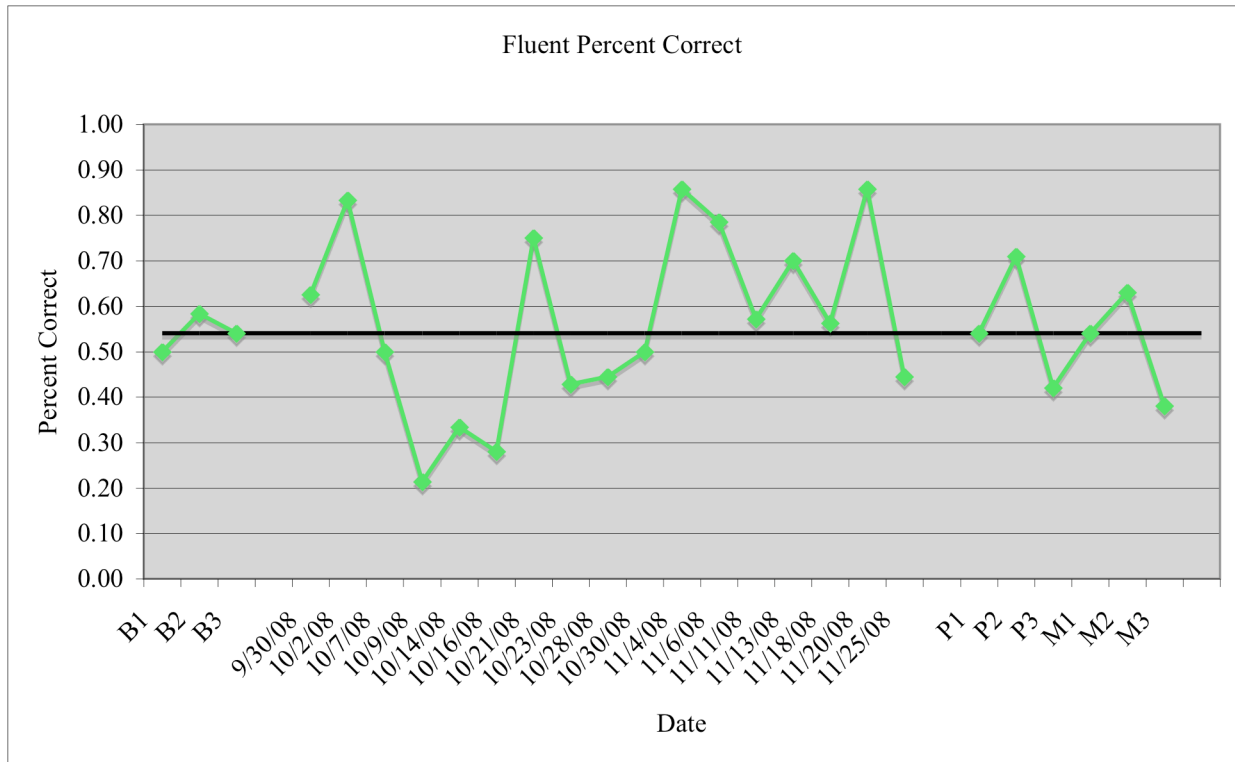

Figure 1. Comparison of Fluent individual treatment sessions to baseline average

2a. Does the participant demonstrate improvement on naming skills based on comparison of pre- and post-treatment *Boston Naming Test* (Kaplan et al., 2001) scores?

The mean on the BNT for adults 60-69 is 53.3 with a standard deviation of 4.6 (Kaplan et al., 2001). Fluent correctly labeled 53 of the 60 stimulus items during pre-testing assessment. After 17 treatment sessions, Fluent accurately identified 47 of the administered stimulus items. This decline is more than 1.0 standard deviations (*s.d. = 4.6)* below the mean for the BNT. Non-fluent accurately labeled 35 of the stimulus items prior to treatment and 38 subsequent to treatment. This change was within one standard deviation (*s.d.* = 4.6; Kaplan et al., 2001).
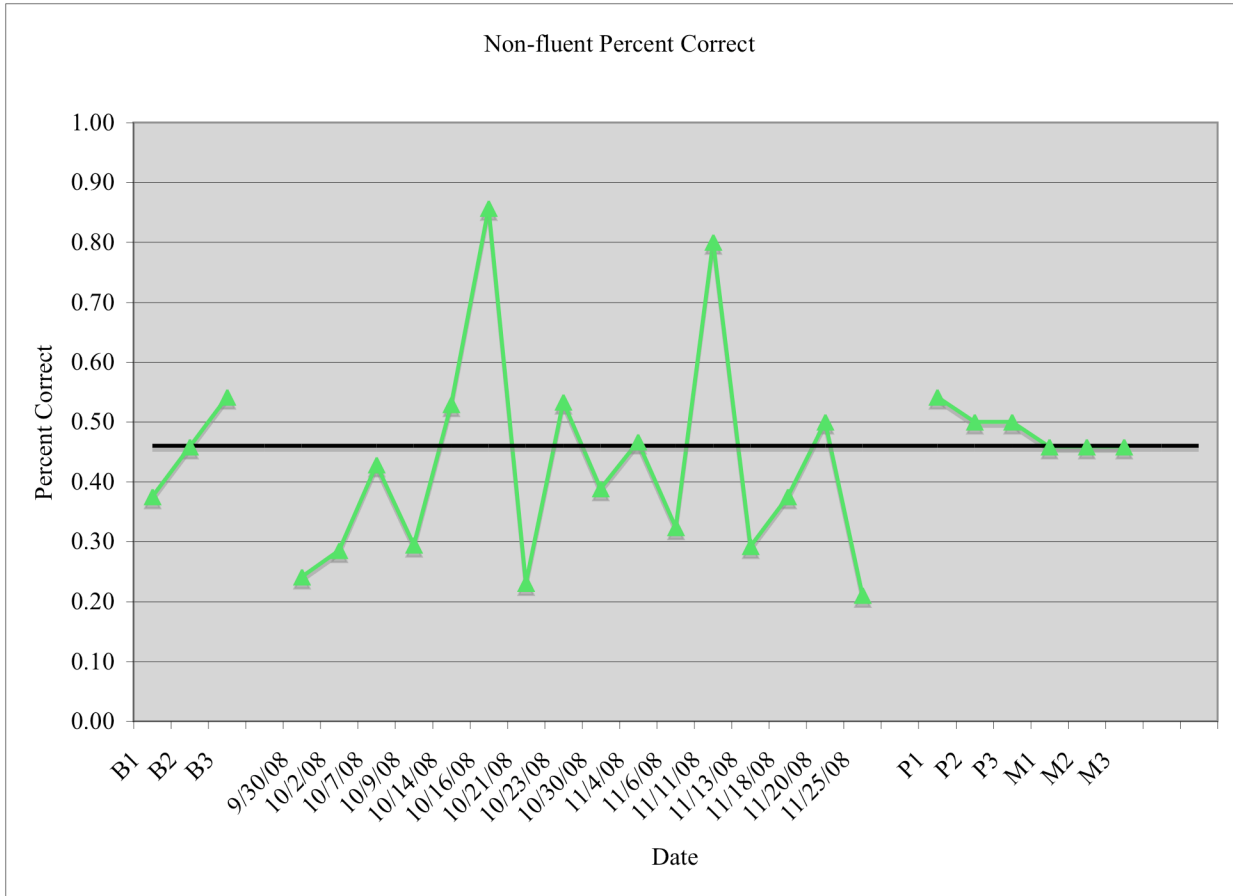
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Figure 2. Comparison of Non-fluent individual treatment sessions to baseline average

2b. Does the participant demonstrate improvement on connected speech production based on

comparison of pre- and post-treatment *Correct Information Units* (Nicholas &

Brookshire, 1993)?

Correct Information Units were used to determine informativeness and efficiency of

verbal expression in a connected speech task (Nicholas & Brookshire, 1993). Unintelligible

utterances and nonword fillers such as "um" were excluded from the total word count.

Inaccurate descriptors, revisions, unfinished words, abandoned phrases, word or phrase

repetitions, nonspecific pronouns or words, and filler conjunctions, words, and phrases were

omitted in the calculation of CIUs.

On the single picture stimulus, Fluent increased from 51.6% CIUs pre-treatment to 70.2% following treatment. This improvement was paralleled on the picture sequence task, improving from 53.6% to 80.1%. Non-fluent improved on the single picture stimulus from 43.5% to 54.9% CIUs following treatment. These results were consistent with Non-fluent's CIUs on the picture sequence stimulus, increasing from 31.0% to 41.3%.

Based on increase in percent correct of CIU's, both participants demonstrated improvement in the connected speech task. Although the literature has documented that CIU's are valid and reliable measures of aphasia, they do not report studies that demonstrate CIU's ability to detect change. Therefore, although both participants did show increases in the percentage of CIU's we cannot say whether these changes demonstrate clinically significant improvement or not.

Table 1: Picture Stimulus

	Non-fluent		Fluent	
	Pretesting	Posttesting	Pretesting	Posttesting
# words	46	51	159	238
# CIUs	20	28	82	167
% CIUs	43.5%	54.9%	51.6%	70.2%

Table 2: Picture Sequence Stimulus

	Non-fluent		Fluent	
	Pretesting	Posttesting	Pretesting	Posttesting
# words	58	92	155	196
# CIUs	18	38	83	157
% CIUs	31.0%	41.3%	53.6%	80.1%

2c. Does the participant demonstrate improvement on functional communication skills based on

comparison of pre- and post-treatment *ASHA Functional Assessment of Communication*

Skills (Frattali et al., 1995) scores?

Caregiver or therapist completed the ASHA FACS *Social Communication* (Frattali et al., 1995)

subtest, to assess change in functional communication skills at home, and other settings. The

ASHA-FACS (Frattali et al., 1995) consists of a range of functional communication tasks ranked

on a scale from 1, indicating inability to perform task, to seven, indicating complete

independence for the specified task. These ratings were converted to logit scores, thus resulting

in an interval scale, during a Rasch analysis of the ASHA-FACS (Donovan et al., 2006). The

resulting logit score is based on item-level difficulty compared to the person's ability to perform

the task. The scale ranges from -5 to +5 logits with a standard deviation of 1.0.

Prior to treatment, Fluent was able to complete simple conversational tasks

independently. He required minimal to moderate assistance with complex conversational tasks.

Using the logit score of the converted ASHA-FACS (Frattali et al., 1995), Fluent's ratings

converted to +1.8 logits. Following treatment, Fluent demonstrated increased independence in

complex conversational tasks, such as exchanging information on the phone, initiating topic

change, adjusting to changes in topic, recognizing and correcting errors in conversation, and

understanding non-literal information. His ratings converted to +3.2 logits, indicating a

significant change in functional communication abilities.

Prior to treatment, Non-fluent's ratings converted to +0.8 logits. She required minimal to

moderate assistance with simple conversational tasks and minimal to maximal assistance with

complex conversational tasks. After participating in GAT, Non-fluent required less assistance

exchanging information on the phone and understanding facial expressions. Her rating

converted to +2.4 logits following treatment, indicating a positive change in her functional communication abilities.

2d. Does the participant demonstrate improvement on quality of communicative life based on the *ASHA Quality of Communicative Life* (Paul et al., 2004) scores?

The ASHA-QCL Scale (Paul et al., 2004) was administered to determine if participants experienced a change in quality of life after GAT. The QCL Scale (Paul et al., 2004) consists of 17 statements. Each statement is ranked using a scale, ranging from a score of 1 to 5. A rating of 5 indicates strong agreement with the statement and a score of 1 indicates strong disagreement with the statement. The ASHA-QCL Scale (Paul et al., 2004) manual suggests rounding scores up to whole numbers but responses were scored in increments of 0.5 to increase precision of response in this study. We report absolute change in ratings for both participants because the manual does not provide statistical data regarding interpretation of scoring. Statistical data for the ASHA-QCL (Paul et al., 2004) is not available beyond test-retest reliability (Eadie et al., 2006). Both participants disregarded the statement "I meet the communication needs of my job or school" because they were not employed. Non-fluent also disregarded the statement "I have household responsibilities" because she lived in a nursing facility.

Based on Fluent's responses, his mean rating prior to treatment was 3.84. It increased to 4.09 after treatment. This change indicates a 6.11% absolute change in ratings. Prior to treatment, Fluent indicated his role in the family had changed, giving the statement "My role in the family is the same" a rating of 2.0. Following treatment, Fluent rated this statement a 3.5, indicating an improvement in his role at home. In response to "People understand me when I talk," Fluent indicated a rating of 2.5 prior to treatment and 4.5 following treatment. Other ratings indicated an improvement in the level of difficulty communicating, inclusion in

conversation, and perseverance when communicating. Using the QCL Scale (Paul et al., 2004), Fluent expressed a mild decrease in confidence, decreased activity out of the house, and reduced staying in touch with family and friends.

Non-fluent's mean rating before treatment was 4.87 and decreased to 4.77 following treatment, indicating a 2.05% absolute decrease in QCL. Ratings indicated reduced confidence, increased difficulty when communicating, and increased difficulty communicating information to listeners. A mild improvement in independence was indicated by the statement, "I make my own decisions."

3. Is there a difference in the amount of change each participant demonstrated relative to his/her total time in treatment?

Although Non-fluent has participated in individual and group therapy longer than Fluent, she demonstrated a larger increase in percent of correct responses.

Follow-up Analysis

Additional data were taken prior to treatment, throughout treatment, and following treatment. In an effort to further understand what treatment variables may have contributed to change in word retrieval skills, further analysis were completed to answer the following questions:

1. Is there a statistically significant relationship between percent correct responses and percent delayed responses?

Data from pre-testing assessment, treatment assessment, post-testing assessment, and maintenance assessment were analyzed to determine if a correlation exists between correct responses and delayed responses. Analysis of Fluent's responses yielded $r = .254$, $p = .231$, indicated that there was not a significant relationship between the variables. Similarly, analysis

of Non-fluent's data revealed $r = .240$, $p = .271$, indicated that the relationship between the variables was not significant.

2. Is there a statistically significant relationship between percent correct and average number of responses per trial?

Assessment during pre-testing, post-testing, and maintenance did not include multiple attempts at a target word; therefore data regarding average number of responses per trial only pertain to treatment data. Treatment data were analyzed, investigating a relationship between correct responses and average number of responses per trial. Results indicated a significant negative moderate correlation for Fluent ($r = -.574$, $p = .003$) and significant negative strong correlation for Non-fluent ($r = -.783$, $p < .001$). As Fluent's number of correct responses rose, the average number of responses per trial fell (i.e. single correct response would be 1:1, incorrect response requiring 3 more cued attempts to arrive at the correct response would be response would be 1:4).

3. Is there a statistically significant relationship between percent correct and average level of cueing?

Assessment during pre-testing, post-testing, and maintenance did not include cueing; therefore data regarding average level of cueing only pertain to treatment data. Fluent's data indicated a significant moderate correlation ($r = .620$, $p = .008$). Non-fluent's data also indicated a significant moderate correlation of $r = .617$, $p = .011$.

<div align="center">Reliability</div>

Reliability was assessed for percent correct responses using two randomly selected GAT sessions. The results are as follows:

Table 3: Intra-Rater Reliability

Actual Score	Reviewed Score	% Agreement
86	100	86
32	32	100
28	35	93
79	92	87

Table 4: Inter-Rater Reliability

Actual Score	Reviewed Score	% Agreement
86	100	86
32	36	96
28	30	98
79	93	86

DISCUSSION

Both participants demonstrated progress during GAT. Non-fluent demonstrated a large effect size for percent correct responses ($d = .625$) and Fluent demonstrated a moderate effect size for percent correct responses ($d = .476$). These results indicate that both subjects improved on trained activities. Neither participant demonstrated improvement on the BNT (Kaplan et al., 2001), indicating lack of generalization of word retrieval skills to untrained items/activities. In fact, Fluent demonstrated a decrease on responses to the BNT > 1.0 stand deviations. These conflicting results suggest an improvement in activities specifically targeted in therapy but a failure to generalize word retrieval skills. Fluent demonstrated improvement on familiar activities but due to his decline in unfamiliar word retrieval activities (i.e. BNT), treatment did not effectively improve word retrieval skills.

Both participants demonstrated improvement in connected speech production as demonstrated by increases in CIUs (Nicholas & Brookshire, 1993). That is not to say that that increased CIU's provide evidence that the participants demonstrated improved word retrieval skills. CIUs assess discourse, measuring the number of related and accurate words used to describe pictures. In fact, circumlocution could result in higher percent CIUs than producing a target in a one-word response, as increased number of related words yields higher percent CIUs. It is suspected that compensatory strategies, such as circumlocution, contributed to increased CIUs. Although the intent of our treatment study was to focus on word retrieval treatment, this study was overlaid on the existing structure of GAT at LSU, which encourages the use of any and all compensatory strategies to elicit words rather than focusing on specific treatment techniques. By encouraging the use of compensatory strategies, clinicians may have inadvertently inhibited word retrieval treatment by encouraging participants to rely on total

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communication. This practice was discouraged in the current study, but was unable to be eliminated.

Both participants experienced a positive change in their functional communication abilities based on the ASHA-FACS (Frattali et al., 1995) ratings. These improvements coincide with reported improvements in quality of life. This is consistent with evidence indicating that quality of life is directly related to communicative abilities (Saloman, Vestrager, & Jahd, 1988).

On the ASHA-QCL (Paul et al., 2004) Scale, Fluent's responses indicated a substantial change in quality of life, while Non-fluent's responses indicated a small decline. These changes could be correlated to recency of therapy. Directly prior to the current study, Non-fluent was enrolled in GAT, while Fluent did not attend GAT over the course of the previous summer. Fluent's substantial improvement in quality of life may have been the result of increased emotional support and social interaction in the context of GAT. Non-fluent's relatively stable quality of life may be the result of her recent participation in GAT and therefore consistent emotional support and social interaction. However, another reason for Non-fluent's stable QCL ratings is that she lives in a nursing home which may allow for less autonomy and opportunity for change, and may result in fewer communicative opportunities and/or demands.

Analysis of percent correct responses in relation to total time in treatment revealed no affect on amount of change. Non-fluent demonstrated a larger effect size relative to Fluent, indicating that total time in treatment does not affect amount of change.

Follow-up analysis examined correlations in comparison to percent correct responses. Analysis revealed no correlation between percent correct responses and percent delayed responses, indicating that a delayed response does not produce or hinder a correct response. A negative correlation existed between percent correct responses and average number of responses

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per trial for both participants. This correlation was expected due to the fact that incorrect responses yield further attempts at a correct response, thereby increasing the number of responses. A positive correlation existed between percent correct responses and average level of cueing for both participants, indicating that lower levels of cueing (i.e. more powerful cueing) was related to elicitation of correct responses. For example, providing a synonym or antonym led to a correct response more often than a descriptive statement led to a correct response. Future studies should investigate which level of cueing most typically prompts a correct response, indirectly investigated if the cues are in fact arranged from least to most powerful cue.

<div align="center">Limitations</div>

The current study was overlaid on an existing clinical practice at the LSU SLHC. Because of that, although we attempted to control for variables in scoring that could confound the results, we were not able to control for certain aspects of the existing treatment structure. Several limitations were encountered due to the existing structure.

Clinicians selected word retrieval activities from a list of suggested activities provided by the PI. The Appendix lists the performed activities and their frequency of administration. Some activities were not used, while some were used more frequently, thus increasing the possibility that task familiarity played a part in treatment effect. In retrospect, the activity difficulty level was not controlled for and may have resulted in some of the fluctuations in percent of correct responses noted from day to day. This limitation may have contributed to the results of the BNT (Kaplan et al., 2001). The pictures in the BNT are arranged from high frequency of occurrence to low frequency of occurrence. Activities may have frequently targeted high frequency of occurrence words and rarely targeted low frequency of occurrence words.

Additionally data collection of delayed responses may have been confounded due to the current structure of GAT. Delayed responses were recorded for each session, but not all delayed responses may have been readily observable. For example, certain activities required each group member to respond to the same stimulus item, thereby allowing each group member a different amount of time to retrieve a response before he/she was required to respond.

Since the LSU SLHC is a teaching facility, another possible limitation of the study was the inexperience of the student-clinicians administering GAT. For example, some differences were noted among clinicians with regard to consistency of cues provided and accuracy of responses reinforced (i.e., occasionally an incorrect response was accepted as correct, and participants were not provided with additional cueing to elicit the correct response), which affected the study's scoring—percent correct responses, average level of cueing, and average number of responses per trial. On other occasions, when clinicians did not accept correct responses but continued to cue a participant for another response, the average number of responses per trial and average level of cueing would have increased unnecessarily.

Future Studies

While the participants of this study did experience significant changes in percent correct responses, these skills were not maintained. We believe that the study of GAT efficacy is ripe for further research. First we suggest that future studies be done to address this study's limitations. We recommend that the current study be repeated using a more defined and replicable treatment. Others have noted that the lack of treatment standardization presents a significant barrier to replicating studies that have reported on GAT's efficacy (Robey, 1998; Kearns & Elman, 2001). In addition we recommend that GAT delivery could be restructured at the LSU SLHC to reflect the use of current best evidence; and where evidence is lacking, to

develop a system to gather practice-based evidence (Wambaugh, 2007), in order to determine the efficacy of GAT being administered at this site. This would appear to be an appropriate line of study since ASHA has mandated the use of evidence-based practice (EBP).   Furthermore using an EBP foundation for treatment would allow student-clinicians hands-on opportunities to learn to use EBP. Yet another study could be done to determine whether PWA benefit more from GAT activities that reflect functional, real-life communicative situations presented at each participant's level of communicative functioning than they benefit from traditional impairment level treatments such as structured word retrieval tasks.   In all cases, studies might investigate the treatment effect of GAT when participants are grouped according to specific diagnostic categories, or specific cognitive and communicative deficits. Finally, we propose that the connected speech samples used in our current research (picture description and picture sequencing) might lend themselves to analysis not just of increased quantity of verbal expression, but quality of verbal expression as well (i.e., increases in sentence complexity, discourse cohesion, inferences, and story elements).

SUMMARY

In conclusion, this study provided additional evidence for the efficacy of multipurpose GAT. It also documented the presence or absence of change in each of the WHO ICF (WHO, 2001) components and quality of life. The results of this study indicate that this GAT design does not successfully address each component and indicates the need for evidence of a GAT that effectively treats each component. As researchers continue to investigate GAT, PWA can expect a treatment that is effective in the treatment of word retrieval deficits and generalization, resulting in improved activity, participation, and quality of life. There are no current studies that provide an effective GAT that improves all the components associated with a word retrieval deficit.

REFERENCES

American Speech-Language-Hearing Association. (2001). *Scope of practice in speech-language-pathology*. Rockville, MD: Author.

Beeson, P. B., Holland, A. L. (2007). Aphasia Group in a University Setting. In Roberta J. Elman (Ed.), *Group Treatment of Neurogenic Communication Disorders: The Expert Clinician's Approach* (pp. 145-158). San Diego: Plural Publishing.

Beeson, P. M., Robey, R. R. (2006). Evaluating Single-Subject Treatment Research: Lessons Learned from the Aphasia Literature. *Neuropsychology Review*, 16, 161- 169.

Bollinger, R., Musson, N., & Holland, A. (1993). A study of group communication intervention with chronically aphasic persons. *Aphasiology*, 7, 301-313.

Boyle, M., & Coelho, C. A. (1995). Application of semantic feature analysis as a treatment for aphasic dysnomia. *American Journal of Speech Language Pathology*, 4, 94-98.

Brandt, E. N. Jr., & Pope, A. M., Models of disability and rehabilitation. In: Brandt, E. N., Jr., Pope, A. M., eds. Enabling America: assessing the role of rehabilitation science and engineering. Washington, D.C.: National Academy Press, 1997: 24-39.

Brookshire, R. H. (1997). An introduction to neurogenic communication disorders (5th ed.). Saint Louis, MO: Mosby Year Book.

Coelho, C. A., McHugh, R., & Boyle, M. (2000). Semantic feature analysis as a treatment for aphasic dysnomia: A replication. *Aphasiology*, 14, 133-142.

Davis, G. A. (2000). *Aphasiology: Disorders and clinical practice*. Boston: Allyn & Bacon.

Davis, G.A., & Wilcox, M.J. (1981). Incorporating parameters of natural conversation in aphasia treatment. In R. Chapey (ED.), *Language intervention strategies in adult aphasia*. Baltimore: Williams & Wilkins.

Deloche, G., Dordain, M., & Kremin, H. (1993). Rehabilitation of confrontation naming in aphasia: Relations between oral and written modalities. *Aphasiology*, 7, 210–216.

Disimoni, R., Keith, R., & Darley, R. (1980). Prediction of PICA overall score by short version of the test. *Journal of Speech and Hearing Research, 23*, 511-516.

Donovan, N. J., Rosenbek, J. C., Ketterson, T. U., & Velozo, C. A. (2006). Adding meaning to measurement: initial Rasch analysis of the ASHA FACS Social Communication Subtest. *Aphasiology, 20*, 362-373.

Eadie, T. L., Yorkston, K. M., Klasner, E. R., Dudgeon, B. J., Deitz, J. C., Baylor, C. R., Miller, R. M., Amtmann, D. (2006). Measuring communicative participation: A review of self-report instruments in speech-language pathology. *American Journal of Speech-Language Pathology*, 15, 307-320.

Elman, R. J. (1998). Memories of the "plateau": Health care changes provide an opportunity to refine aphasia treatment and discharge. *Aphasiology*, 12(3), 227-231.

Elman, R. J. (2007). Introduction to Group Treatment of Neurogenic Communication Disorders. In Roberta J. Elman (Ed.), *Group Treatment of Neurogenic Communication Disorders: The Expert Clinician's Approach* (pp. 1-10). San Diego: Plural Publishing.

Elman, R. J., & Bernstein-Ellis, E. (1995). What is functional? *American Journal of Speech-Language Pathology*. 4(4), 115-117.

Elman, R. J., & Bernstein-Ellis, E. (1999). The efficacy of group communication treatment in adults with chronic aphasia. *Journal of Speech, Language, and Hearing Research, 42*, 411-419.

EuroQol Group. (1990). EuroQol- a new facility for the measurement of health related quality of life. *Health Policy*. 16, 199-208.

Flanagan, J. L., & Jackson, S. T. (1997). Test-retest reliability of three aphasia tests: Performance of non-brain damaged older adults. *Journal of Communication Disorders*, 30, 33-43.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-Mental State": A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, 12(3): 189-198, 1975.

Frattali, C. M., Thompson, C. K., Holland, A. L., Wohl, C. B., & Ferketic, M. M. (1995). *The American Speech-Language-Hearing Association Functional Assessment of Communication Skills for Adults (ASHA FACS)*. Rockville, MD: American Speech-Language-Hearing Association.

Goodglass, H., & Wingfield, A. (1997). *Anomia: Neuroanatomical and cognitive correlates*. San Diego: Academic Press.

Goodglass, H., Kaplan, E., & Barresi, B. (2001). Boston Diagnostic Aphasia Examination. Baltimore: Lippincott Williams & Wilkins.

Hilari, K., Byng, S., Lamping, D. L., Smith, S. C. (2003). The stroke and aphasia quality of life scale-39 (SAQOL-39): evaluation of acceptability, reliability and validity. *Stroke*, 34, 1944-1950.

Hillis, A.E. (1989). Efficacy and generalization of treatment for aphasic naming errors. *Archives of Physical Medicine and Rehabilitation*, 70, 632-636.

Hillis, A.E. (1993). The Role of Models of Language Processing in Rehabilitation of Language Impairments. *Aphasiology*, 7, 5-26.

Holland, A. (1980). *Communications for Activities of Daily Living: a test of functional communication for aphasic adults*. Baltimore: University Park Press.

Holland, A., & Beeson, P. M. (1999). Aphasia groups: The Arizona experience. In R. J. Elman (Ed.), *Group Treatment for Neurogenic Communication Disorders: The expert clinician's approach*. Woburn, MA: Butterworth-Heinemann.

Jette, A. M. (2003), Assessing disability in studies on physical activity. American Journal of Preventative Medicine, 25(3),122-128.

Kagan, A., & LeBlanc, K. (2002). Motivating for infrastructure change: toward a communicatively accessible, participation-based stroke care system for all those affected by aphasia. *Journal of Communication Disorders, 35*, 153-169.

Kaplan, E., Goodglass, H., & Weintraub, S. (2001). *Boston Naming Test*. Baltimore, MD: Lippincott Williams & Wilkins.

Kearns, K. (1989). Methodologies for studying generalization. In J. Spradline & L. McReynolds (eds.), *Generalization strategies in communication disorders*. Toronto: B.C. Decker.

Kearns, K. P., & Elman, R. J. (2001). Group therapy for aphasia: Theoretical and practical considerations. In: R. Chapey (Ed.), *Language intervention strategies in adult aphasia* (4th ed, pp.316-337). Baltimore: Lippincott Williams & Wilkins.

Kearns, K. P., & Simmons, N. N. (1985). Group therapy for aphasia: A survey of Veterans Administration Medical Centers. In R.H. Brookshire (ed.), *Clinical aphasiology conference proceedings* (pp. 176-183), Minneapolis, MN: BRK.

Kendall, D.L., Rosenbek, J. C., Heilman, K. M., Conway, T., Klenberg, K., Rothi, L. G. R., Nadeau, S. E. (2008). Phoneme-based rehabilitation of anomia. *Brain and Language*, 105, 1-17.

Kertesz, A. (1983). *Western Aphasia Battery*. San Antonio, TX: The Psychological Corporation.

Keysor, J. J., & Jette, A. M. (2001). Have we oversold the benefit of late-life exercise? *Journal of Gerontology: Medical Sciences*, 56A(7), M412-M423.

Kromrey, J. D., & Foster-Johnson, L. (1996). Determining the efficacy of intervention: The use of effect sizes for data analysis in single-subject research. *Journal of Experimental Education*, 65, 73-93.

Lomas, J., Pickard, L., Bester, S., Elbard, H., Finlayson, A., Zoghaib, C. (1989). The Communicative Effectiveness Index. *Journal of Speech and Hearing Disorders*, 54, 113-124.

Lyon, J. (1992). Communicative use and participation in life for aphasic adults in natural settings: The scope of the problem. *American Journal of Speech-Language Pathology*, 1(3), 7-14.

Lyon, J. G. (2000). Finding, defining, and refining functionality in real life for people confronting aphasia. In L. E. Worrall & C. M. Frattali (Eds.), *Neurogenic Communication Disorders: a functional approach* (pp. 137-161). NY: Thieme.

Marshall, R. C. (1993). Problem focused group therapy for mildly aphasic clients. *American Journal of Speech-Language Pathology*, 2(2), 31-37.

Marshall, R. C., Freed, D. B. (2006). The Personalized Cueing Method: From the Laboratory to the Clinic. *American Journal of Speech-Language Pathology*, 15, 103-111.

Murray, L. L., & Clark, H. M., (2006). *Neurogenic Disorders of Language*. Clifton Park, NY: Thomson Delmar Learning.

Nolan, M., Grant, G. (1992). *Regular respite: an evaluation of a hospital rota bed scheme for elderly people.* London: Ace Books.

Nicholas, L.E., & Brookshire, R.H. (1993). A System from quantifying the informativeness and efficiency of the connected speech of adults with aphasia. *Journal of Speech and Hearing Research*, 36, 338-350.

Nickles, L. (2002). Therapy for naming disorders: Revisiting, revising, and reviewing. *Aphasiology*, 16, 935–979.

Paul, D. R., Frattali, C. M., Holland, A. L., Thompson, C. K., Caperton, C. J., & Slater, S. C. (2004). *The American Speech-Language-Hearing Association Quality of Communication Life Scale (QCL)*: Manual. Rockville, MD: American Speech-Language-Hearing Association.

Porch, B. E., The Porch Index of Communicative Ability. Volume 1. Theory and Development. Palo Alto, Calif.: Consulting Psychologists (1967).

Porch, B. E., The Porch Index of Communicative Ability. Volume 2. Revised Edition: Administration and Scoring. Palo Alto, Calif.: Consulting Psychologists (1973).

Robey, R. R. (1998). A Meta-Analysis of Clinical Outcomes in the Treatment of Aphasia. *Journal of Speech, Language, and Hearing Research*, 41, 172-187.

Robey, R. R., Schultz, M. C., Crawford, A. B., & Sinner, C. A. (1999). Single-subject clinical-outcome research: designs, data, effect sizes, and analyses. *Aphasiology*, 13, 445-473.

Rosenbek, J. C., LaPointe, L. L., Wertz, R. T. (1989). Aphasia: A Clinical Approach. Pro-Ed.

Ross, A., Winslow, I., Marchant, P., & Brumfitt, S. (2006). Evaluation of communication, Life participation and psychological well-being in chronic aphasia: The influence of Group intervention. *Aphasiology* 20 (5), 427-448.

Ross, K. B., & Wertz, R. T. (1999). Comparison of impairment and disability measures for assessing severity of, and improvement in, aphasia. *Aphasiology*, 13(2), 113-124.

Salomon, G., Vestrager, V., & Jahd, M. (1988). Age related hearing difficulties: (I) Hearing impairment, disability and handicap – a controlled study. *Audiology*, 27, 164-178.

Shipley, K.G., & McAfee, J.G. (2004). *Assessment in Speech-Language Pathology*. Clifton Park, NY: Delmar Learning.

Simmons-Mackie, N., Damico, J. S. (2009). Engagement in Group Therapy for Aphasia. *Seminars in Speech and Language*, 30, 18-26.

Simmons-Mackie, N., Elman, R. J., Holland, A. L., Damico, J. S. (2007). Management of Discourse in Group Therapy for Aphasia. *Topics in Language Disorders*, 27, 5-23.

Thompson, C. (1989). Generalization research in aphasia: A review of the literature. *Clinical Aphasiology, 18*, 195-222.

Van der Gaag, A., Smith, L., Davies, S., Moss, B., Cornelius, V., Laing, S., et al. (2005). Therapy and support services for people with long term stroke and aphasia and their relatives: A six month follow up study. *Clinical Rehabilitation*, 19(4), 372-380.

Ventry, I., & Weinstein, B., (1983). Identification of elderly people with hearing problems. *American Speech-Language-Hearing Association*, July, 37-42.

Wambaugh, J.L., (2007). The evidence-based practice and practice-based evidence nexus. *ASHA Special Interest Division 2: Neurophysiology and Neurogenic Speech and Language Disorders, Perspectives, April,* 14-18.

Wambaugh, J. L., Linebaugh, C. W., Doyle, P. J., Martinez, A. L., Kalinyak-Fliszar, M., & Spencer, K. A. (2001). Effects of two cueing treatments on lexical retrieval in aphasic speakers with different levels of deficit. *Aphasiology*, 15, 933-950.

Wertz, R., Collins, M., Weiss, D., Kurtzke, J., Friden, R., Brookshire, R., et al. (1981). Veterans Administration cooperative study on aphasia: A comparison of individual and group treatment. *Journal of Speech and Hearing Research*, 24, 580-594.

World Health Organization. (2001). The international classification of functioning, disability and health. Geneva: Switzerland: Author.

APPENDIX

Suggested and Completed Activities

Suggested Activities		Completed Activities
(Beeson & Holland, 2007)		
Description	**Examples**	
PACE activities (Davis & Wilcox, 1981): Existing activities at LSU were modified based on the principles of PACE. .	• Who Am I? • What Am I? • Where Am I? Group members provide clues for a person, object, or place while another group member attempted to guess the target, using the provided clues	• Who Am I? (1) • What Am I? (1) • Where Am I? (1)
Role playing and simulations	Clinicians facilitate role playing associated with: • daily living activities • upcoming group activities	Not used
Stating opinions and solving problems	Clinicians provide problems typically encountered in daily living and ask group	• Planning Ahead (2)

	members for possible solutions.	
Current events discussion	Clinicians provide current events from the local newspaper or campus paper for discussion. Clinicians may also initiate topics from the local or national news.	Not used
Games	• Categories • Family Feud • Jeopardy • Taboo.	• Categories (8) • Jeopardy (1) • Word Bust (1)

Activities completed that do not fall under suggested activities

- Part/Whole (1)

- Alphabet Game (1)

- What's in a name? (1)

- In short (1)

- Compound Words (1)

- Other: Clinician provided semantic information and clients provided an appropriate

  answer (Ex: something you can start) (1)

VITA

Claire Renee Zimmerman was born in Baton Rouge, Louisiana. Upon graduation from St. Joseph's Academy in Baton Rouge, Louisiana, she enrolled in Louisiana State University and Agricultural and Mechanical College of Baton Rouge to pursue a Bachelor of Arts degree in communication sciences and disorders, awarded in May of 2007. After completing her first year of graduate school in communication disorders, Miss Zimmerman was intrigued by the research opportunities available in her field of study. She then decided to complete a master's thesis research project in partial fulfillment of the requirements for her Master of Arts degree in communication sciences and disorders, to be awarded May of 2009. Upon graduation, Miss Zimmerman plans to reside in Baton Rouge, Louisiana where she will complete the necessary clinical fellow requirements to become a licensed speech-language pathologist.