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Influence of Perceived Self-Efficacy on Treatment Outcomes for Aphasia

Allison B. Dunn
University of South Florida

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on Treatment Outcomes for Aphasia

by

Allison B. Dunn

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Major Professor: Jacqueline J. Hinckley, Ph.D.
Gail V. Pashek, Ph.D.
Cheryl A. Paul, M.S.

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Table of Contents

List of Tables

List of Figures

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ABSTRACT

Perceived self-efficacy has been shown to be an accurate predictor of one's performance capabilities (Zimmerman, 2000). Low levels of perceived self-efficacy have been found to correlate with negative performance outcomes; while high levels of perceived self-efficacy correlate with positive performance outcomes. This construct has also been found to influence an individual's motivation level, goal setting ability, and risk for depression (Resnick, 2002; Phillips & Gully, 1997; Blazer, 2002). Therefore, perceived levels of self-efficacy may predict and influence performance of individuals with aphasia during a treatment program. However, the influence of self-efficacy on treatment for aphasia has not been sufficiently studied. The present study examined the differences between Response Elaboration Training (Kearns, 1985) and a modified version of Response Elaboration Training, incorporating the four sources of self-efficacy. First, it was hypothesized that the individual's level of perceived self-efficacy would predict performance during treatment. Also, it was hypothesized that a treatment incorporating self-efficacy would result in increased levels of self-efficacy, thereby promoting more positive therapeutic outcomes. A single-subject, cross-over design was employed; two individuals

with Broca type aphasia received both types of treatment at alternating intervals. A relationship between perceived self-efficacy levels and performance outcomes was suggested. Participant one, with a high level of perceived self-efficacy for communicative tasks, experienced a general trend of improvement for effective communication. Participant two's use of effective communication revealed minimal change throughout the study; he also reported low to moderate levels of perceived self-efficacy in all modalities of communication throughout the study. Participant two's performance revealed slight improvements in self-efficacy, however, as well as improvements on a standardized aphasia assessment; this finding may suggest a relationship between increased self-efficacy and increased performance on the assessment. Results suggest that a treatment incorporating the four sources of self-efficacy may promote more positive treatment outcomes for individuals with aphasia.

Chapter One

Introduction

Self-efficacy, a term coined by Bandura in 1977, refers to a person's belief about his or her capabilities to execute the necessary steps to complete a given task (Van der Bijl & Shortridge-Baggett, 2001). Levels of perceived self-efficacy for individuals without brain damage have been found to be an accurate predictor of performance; the higher the level (i.e., the belief that one is able to perform a task), the better a person may perform (Zimmerman, 2000). Also, self-efficacy has been related to an individual's ability to set and accomplish goals (Vancouver & Thompson, 2001). Higher self-efficacy levels may also increase overall motivation and decrease risks of depression (Resnick, 2002; Blazer, 2002). Low self-efficacy levels have been shown to correlate with poor performance and achievement of goals toward a certain task.

It has been found that the modification of self-efficacy from a low level to a high level positively correlates with changes in performance (i.e., from poor performance to satisfactory performance on a given task) (Bandura, Adams, & Beyer, 1977). For example, snake phobias were reduced as a person's self-efficacy, or belief that they could handle snakes, was increased (Bandura, Adams & Beyer, 1977). This inverse relationship illustrates that self-efficacy can be modified and, once modified, is associated with a behavioral change. This

construct, however, has not been sufficiently studied in the realm of aphasia. It may be beneficial to assess an individual's level of self-efficacy prior to treatment for aphasia. If an individual is found to have low self-efficacy toward communication tasks, he/she may have a poor therapeutic outcome. Therefore, incorporation of sources of self-efficacy into treatment for aphasia may promote a more positive treatment outcome. As self-efficacy is increased, one should see an increase in performance accomplishments.

Self-efficacy: A predictor of performance

The level of perceived self-efficacy has been found to be an accurate predictor of behavior in a given task (Zimmerman, 2000). According to Bandura (1986), a negative perceived self-efficacy, or self-inefficacy, may cause a person to approach a situation or task anxiously, which may in turn have a negative effect on his/her performance (i.e. a person who feels he/she is not capable to complete math assignments will approach a math examination with fear, thus causing them to perform poorly on the exam). It has been found that perceived self-efficacy does correlate with an individual's choice of tasks in academic subjects, college majors, perseverance, and overall success in school (Zimmerman, 2000). Also, along with self-evaluation and goal setting, self-efficacy aids in mediating personal motivation for a given task. The correlation between self-efficacy and personal goal setting has illustrated that an individual with a strong perceived self-efficacy will set and accomplish more difficult goals (Vancouver & Thompson, 2001).

It is cautioned, however, that even though self-efficacy may be a predictor of behavior, it should not be considered a cause of behavior (Hawkins, 1992). Since performance on a task may be affected by many extraneous variables, an argument has been made that self-efficacy alone does not have the power to fully explain performance. An example of one such extraneous variable is the use of positive reinforcement which may lead way to better performance. Hawkins (1992) argues that positive reinforcement given for a behavior will, in turn, cause that behavior to increase in frequency. In this manner, positive reinforcement is causing the increase in behavior, not the individual's level of self-efficacy (Hawkins, 1992).

Sources of Self-Efficacy

According to Bandura, Adams, and Beyer (1977), four sources of self-efficacy have been established: performance accomplishments, vicarious experiences, verbal persuasion, and emotional arousal. A performance accomplishment, the most influential source of self-efficacy according to Bandura, Adams, and Beyer (1997), is the idea that perceived self-efficacy is influenced by previous accomplishments. In other words, individuals will formulate their self-efficacy of a particular task based on how successful they were with the task previously. On the other hand, Hawkins (1992) debates this theory, saying that prior experiences that were successful are the same as a behavior that has been positively reinforced through success. Therefore, self-efficacy is not necessarily higher in these situations; the individual merely has

less anxiety for the task due to positive reinforcement. However, it has been argued by Bandura, Adams, & Beyer (1977) that success in previous tasks (i.e., satisfactory progress in a task) results in a high level of perceived self-efficacy, while previous failures result in a low-level of perceived self-efficacy.

The second source of self-efficacy, vicarious experience, is the idea that a person determines his/her own capability for a given task based on observations of others performing the same task. While less effective at influencing self-efficacy than performance accomplishments, it does assume that if one observes another's success in a task, he/she will feel that they, too, are capable of performing the task (Bandura, Adams, & Beyer, 1977). Hawkins (1992) debates this idea as well, asserting that an observation of others performing a task is merely a learning experience. Following a model of a successful performance, the individual has learned how to perform to succeed, therefore, self-efficacy is not a factor. Bandura, Adams, & Beyer (1977) do argue, however, that observation of others similar to oneself succeeding in a task will result in the belief that one is capable of performing the task as well.

Verbal persuasion, the most frequently utilized source of self-efficacy, is the idea that individuals gain a higher level of self-efficacy through persuasion by others (i.e. other individuals persuading one that he/she is capable of successfully performing the given task). However, this source has been found to not be as reliable as performance accomplishments or vicarious experience (Bandura, Adams, & Beyer, 1977). Hawkins (1992) cautions that persuasion

may cause an individual to execute a task that they would otherwise avoid, thereby creating unnecessary anxiety which may hinder success. Positive persuasion, not causing anxiety, has been argued to strengthen self-efficacy (Bandura, Adams, & Beyer, 1977).

The final source of self-efficacy, emotional arousal, is the belief that self-efficacy may be influenced by an individual's physiological arousal (i.e. anxiety) concerning a certain task. Through this belief, a person may have a lower level of self-efficacy if highly anxious about performing a task, or a higher level of self-efficacy if no anxiety is present (Bandura, Adams, & Beyer, 1977).

The Influence and Interaction of Self-Efficacy

An individual's level of perceived self-efficacy may influence other personal constructs, such as motivation. It has been suggested that a low level of perceived self-efficacy for a given task may negatively impact the individual's level of motivation and goal setting for that task (Resnick, 2002; Phillips & Gully, 1997). Also, a low level of self-efficacy has been shown to increase an individual's risk factor for depression (Blazer, 2002). If self-efficacy levels do impact these constructs, treatment outcomes and prognosis following medical ailments and disabilities may also be negatively impacted. This section will discuss how levels of self-efficacy may give way to low levels of motivation, setting of low-level goals, and higher risks of depression. Since these constructs have been shown to also impact therapeutic outcomes, this further supports the suggestion that levels of self-efficacy should be assessed prior to and targeted

during rehabilitation.

Motivation

As suggested by Resnick (2002, p. 1), "motivation is an important variable in the older adult's ability to recover from any disabling event and to perform functional activities". It has been shown that if an older adult lacks the motivation to engage in therapy, overall therapeutic outcomes may be poor. Therefore, it is beneficial and possibly crucial to any intervention to continually assess the person's motivational levels. Assessment of levels of motivation may allow the professional to more accurately form treatment goals (i.e., to target motivation) and an overall prognosis (i.e., poor motivation may lead to poor outcomes). When assessing the individual, one must keep in mind that motivation may be impacted by several personal constructs, especially the construct of self-efficacy. According to Landine and Stewart (1998), there is a positive correlation between levels of self-efficacy and motivational level (i.e., the higher the level of perceived self-efficacy, the higher the motivational level). Therefore, self-efficacy may be a critical factor when assessing motivational levels. If early assessment findings illustrate low levels of self-efficacy, motivation levels may also be low. As previously discussed, low levels of self-efficacy may hinder overall therapeutic outcomes. If motivational levels are also low, rehabilitation outcomes may be further impacted in a negative manner. If the person is not motivated to engage in rehabilitation, he/she may not make as much gain as possible.

Two types of motivation have been identified in the literature, extrinsic

motivation and intrinsic motivation. Extrinsic motivation is motivation deriving from an outside source. In other words, an individual that is extrinsically motivated to perform a task receives motivation from reasons other than personal enjoyment (e.g., motivated to perform a task which will result in receiving money or a reward) (Eccles & Wigfield, 2002). On the other hand, intrinsic motivation derives from within the person. An individual who is intrinsically motivated for a task enjoys and is interested in the task, pursuing the task for personal stimulation. It has been suggested by Eccles and Wigfield (2002) that individuals who have high levels of intrinsic motivation desire to further themselves and continually strive for mastery in a specific task. In order to maintain a high level of intrinsic motivation, however, a person must feel competent and determined for the task. For this reason, self-efficacy has been found to be strongly related to intrinsic motivation. If an individual feels he/she is able to perform a task, he/she is more likely to feel competent and determined to pursue the activity (i.e., have a high level of motivation). If the person feels he/she is unable to perform the task, however, the reverse will happen resulting in low levels of intrinsic motivation (Eccles & Wigfield, 2002). Resnick (2002) suggested that if one believes that he/she is capable to perform a specific task, this belief will motivate them to perform the behavior and vice versa. If intrinsic motivation is poor, the individual will not feel competent and, therefore, be unlikely to perform the task (Resnick, 2002). Therefore, if an individual participating in rehabilitation has low intrinsic motivation, the probability arises that he/she will not willingly engage in

therapeutic tasks. This disengagement from tasks will negatively impact therapeutic outcomes. It has also been found that poor motivation will lead to setting of low-level goals, or poor achievement toward high goals set for the individual (Erez & Judge, 2001). This may further impact treatment outcomes.

Goal Setting

An individual's capability to set and achieve goals is an underlying factor to any therapeutic intervention. During therapy, individuals will have either assigned or personally set goals to achieve in order to measure and motivate progress. It has been argued that high goal setting will increase performance. However, goal setting may be impacted by many personal factors, such as the individual's level of perceived self-efficacy (Phillips & Gully, 1997). It has been found that increased levels of perceived self-efficacy may result in the setting of higher goals and higher performance toward those goals. It has been suggested that goal setting is influence by perceived self-efficacy and not directly by actual ability. As aforementioned, one may perceive that they are unable to perform a task even if they do actually have the ability. If a person does have a high ability to perform a task, he/she may perform the task successfully. This success would result in a successful performance accomplishment, which may positively affect self-efficacy. In this manner, ability is indirectly related to goal setting, but does not have a strong direct correlation with set goals (Phillips & Gully, 1997). Therefore, when considering goal setting and performance toward the goals, a professional should first and foremost consider the individual's level of self-

efficacy in order to determine the goal level he/she may reasonably set and accomplish.

When assessing self-efficacy in relation to goal setting, one may also want to determine the goal orientation of the individual. Two types of goal orientation, learning and performance, have been identified in the literature. An individual with a learning goal orientation has a "desire to increase (his/her) task competence" (Phillips & Gully, 1997, p. 794). Individuals with a high learning goal orientation are more likely to view intelligence as changeable over time and view past failures as learning experiences. Individuals with high performance goal orientations, on the other hand, hold "a desire to do well and to be positively evaluated by others" (Phillips & Gully, 1997, p. 794). These individuals see intelligence as a fixed construct, unable to undergo change with time. Also, a person with a performance goal orientation will not see past failures as learning experiences, rather he/she will view failure as a mistake which may hinder self-efficacy (i.e., low self-efficacy resulting from negative past performance). Due to this theory, it has been suggested that individuals with a high performance goal orientation will have a lower self-efficacy than individuals with a high learning goal orientation (Phillips & Gully, 1997). Therefore, when assessing perceived levels of self-efficacy in relation to goal setting, one may realize a learning goal orientation is more favorable. Individuals with a learning goal orientation may have higher levels of perceived self-efficacy and, therefore, be more likely to set and accomplish higher goals. This has strong implications for therapeutic

interventions, for if a person has high self-efficacy, the probability for those individuals to set and accomplish higher goals is greater. This may result in more favorable treatment outcomes.

Depression

Self-efficacy has also been found to influence an individual's risk for depression (Blazer, 2002). At least 30% of individuals surviving a stroke experience post-stroke depression, with prevalence varying from 18% to 61% of stroke survivors (Gainotti, Antonucci, Marra, & Paolucci, 2001; Herrmann, Black, Lawrence, Szekely, & Szalai, 1998). It has been suggested that depression negatively effects motivation, cognitive functions, and functional recovery.

Gainotti, et. al. (2001) studied individuals diagnosed with depression secondary to recent CVA at the Rehabilitation Center Clinica Santa Lucia from 1994 until 1997. Approximately one-half of the individuals studied were receiving pharmacologic intervention for depression. The individuals participated in a rehabilitation program targeting motor and functional abilities. Following the program, it was found that individuals not being treated for depression experienced more negative treatment outcomes than those individuals receiving antidepressant medications. Through this study, the authors found that individuals with post-stroke depression at three months post-onset had poorer functional recovery following one year of therapy. Therefore, it was found that depression may be related to poor prognosis following stroke. It has been suggested that even mild symptoms of depression may affect overall functional

outcome (Herrmann, et. al., 1998). Individuals who suffer a stroke are more at risk for depression due to isolation, frustration, and loneliness (Herrmann, et. al., 1998). Therefore, it is imperative to consider the risk of depression for an individual with aphasia. If symptoms of depression are evident, functional recovery may be negatively affected.

Low levels of self-efficacy have been found to be a contributor to depression. Individuals with low levels of self-efficacy may rely on others to aide them in performing daily tasks. A result of this aide may be learned helplessness, a result of which is depression (Blazer, 2002). Also, low self-efficacy for communication may lead to withdrawal from social situations, resulting in isolation and loneliness, furthering the risk for depression. Muris (2002) stated that when individuals do not feel competent to meet standards that they feel are socially valued, depression may result. The individual may not feel able to form relationships, further enhancing loneliness. Therefore, an intervention aimed at increasing levels of perceived self-efficacy may reduce depression. As self-efficacy increases, an individual may engage in more social activities and become less reliant on the aide of others. If this occurs, loneliness and learned helplessness may be alleviated.

As discussed in this section, levels of perceived self-efficacy may impact an individual's level of motivation, goal setting, and risk of depression (Resnick, 2002; Phillips & Gully, 1997; Muris, 2002). Motivation and goal setting have been found to affect an individual's performance of a given task (Resnick, 2002;

Phillips & Gully, 1997). Depression may further impact motivation (Gainotti, et. al., 2001). As we have seen, self-efficacy alone may affect an individual's performance. Combined with the impact of levels of self-efficacy on motivation, goal setting, and depression, performance may be more greatly impacted than we have previously seen. In this manner, self-efficacy, motivation, goal-setting, and depression may all be interrelated and affect performance. As speech-language pathologists working with a population already at risk for reduced motivation and depression, self-efficacy remains critical to assess. If one finds that the individual with aphasia has a low level of self-efficacy for communicative tasks, he/she may be at risk for a reduced therapeutic outcome. Also, one may begin to look at other factors that may be impacted by this low level of self-efficacy and, in turn, realize that the individual may be at an even greater risk of a poor treatment outcome. The professional would then be able to continually assess the individual's levels of self-efficacy and ability to accomplish goals. Incorporation of the sources of self-efficacy into a therapeutic regimen through methods incorporating mastery experiences, vicarious experience (i.e., observation of others similar to oneself), verbal persuasion (e.g., praise), and reduction of emotional arousal (e.g., through use of programs such as progressive muscle relaxation), may allow the professional to increase the perceived level of self-efficacy of the individual with aphasia. As shown by Bandura, Adams, & Beyer (1977), increases in self-efficacy have been demonstrated to increase performance for a given task. This increase in self-

efficacy may also indirectly increase motivational levels and reduce the risk for depression. Increases in self-efficacy would also increase the probability of higher set goals and higher performance for these goals. Therefore, the effects of increased self-efficacy on performance, motivation, goal setting, and levels of depression may lead the way to more positive treatment outcomes.

Constructs Related to Self-Efficacy

When assessing and targeting perceived levels of self-efficacy during treatment for individuals with aphasia, one must be cautious not to confuse self-efficacy with related personal constructs, such as self-concept, locus of control, outcome expectancies, and quality of life. The idea of self-concept originated from phenomologists who considered it a type of overall self-perception and the personal reactions made by that perception (Zimmerman, 2000). However, this construct was not found to consistently relate to performance, as does self-efficacy. Therefore, the idea was reconceptualized into a hierarchy of constructs such as academic self-concept and domain-specific self-concept. The latter of the two is the most closely related construct to perceived self-efficacy. Domain-specific self-concept relate to self-esteem reactions to previous tasks. This construct does not, however, relate to predictions of how well a person believes he/she is capable of performing a future task. It has been found that while individuals may have a high level of self-efficacy concerning a task his/her self-esteem after the performance of the task may be low. Therefore, although correlated, it is necessary to differentiate the two constructs (Zimmerman, 2000).

Locus of control relates to the magnitude of an individuals power over a certain situation. Locus of control can be either internal or external. An individual with an internal locus of control believes that performance outcomes and events are controlled intrinsically (i.e., he/she has control over a certain situation/event). On the other hand, individuals with an external locus of control perceive performance outcomes and events to be out of their control (i.e., controlled by others and/or the environment) (Phillips & Gully, 1997). It is hypothesized that performance will be more successful if an individual has an internal locus of control (i.e., intrinsically perceived control) (Zimmerman, 2000). This has been found not to be an accurate predictor of performance, however, and also should be differentiated from self-efficacy (Zimmerman, 2000). However, there is a positive correlation between internal locus of control and self-efficacy. An internal locus of control has been suggested to promote positive self-efficacy. In other words, if an individual feels that he/she is in control of a certain situation, he/she may feel more competent to perform the task and vice versa (Landine & Stewart, 1998).

Outcome expectancy, a personal belief concerning the result of a behavior to be executed, is a third related construct to the idea of self-efficacy. This construct relates to the idea that an individual may make predictions about the outcome of a future task based on the actions necessary to complete the task. However, it has been found that even though an individual may know that certain actions will produce the desired outcome, they may not feel capable of

performing the necessary actions. Therefore, self-efficacy may be negatively correlated with a positive outcome expectancy (Bandura, 1977). It is argued that outcome expectancies and perceived self-efficacy function in an interactive manner, however. An individual's level of perceived self-efficacy may influence the outcome expectancy for a certain task. If the person has a high level of self-efficacy for the task, he/she may feel that performance in the task will lead to a favorable outcome. If self-efficacy levels are low, however, the individual may feel that executing the task will produce a negative outcome (Resnick, 2002).

Formally defined as "individuals' perceptions of their position in life in the context of culture and value systems where they live and in relation to their goals, expectations, standards, and concerns", quality of life is yet another related construct to self-efficacy (Ross & Wertz, 2003). Since this construct is impacted and affected by numerous personal factors, perceived self-efficacy has the capability to either negatively or positively influence quality of life. For instance, as mentioned earlier, perceived self-efficacy has the potential to negatively influence goal setting and expectations of performance. This negative influence has the capability to harm the individual's overall quality of life.

Even though self-efficacy is closely related to each of these personal constructs, an individual's self-efficacy should be regarded as a task-specific entity, differentiated in this way from the other four constructs. Self-efficacy has been found to be a more consistent predictor of performance in a given situation and is more closely related to achievement levels, success, and personal goal

setting (Bandura, 1986). Therefore, when one is determining how well another might perform a task, he/she should first measure the individual's level of self-efficacy relating to the task.

Method for Measurement of Self-Efficacy

In order to accurately measure one's perceived self-efficacy, Bandura devised three-dimensions to be analyzed: the magnitude or level, strength, and generality of one's self-efficacy (Van der Bijl & Shortridge-Baggett, 2001). Through the use of rating scales, the magnitude or level of perceived self-efficacy is measured through exploring the level of difficulty an individual assigns a particular task. The strength of self-efficacy relates to how certain an individual is of oneself in performing a given task. Generality, on the other hand, is focused towards determining the relational magnitude of an individual's self-efficacy across various situations and times (Van der Bijl & Shortridge-Baggett, 2001). The three dimensions of self-efficacy have been debated, however. Critics have argued that self-efficacy should be measured in a broader sense, not restricted to the three dimensions. Critics of the "generality" of self-efficacy have pointed out that it is difficult for individuals to make statements concerning their overall sense of self-efficacy without a particular task in mind due to this construct being, in a sense, domain-specific (Van der Bijl & Shortridge-Baggett, 2001). It has also been cautioned that "self-efficacy beliefs should be measured in terms of particularized judgments of capability that may vary across realms of activity,

different levels of task demands within a given activity domain, and under different situational circumstances" (Van der Bijl & Shortridge-Baggett, 2001).

Traditionally, perceived self-efficacy has been measured through the use of rating scales. Utilizing these scales, individuals rate on a scale of one to ten (one being "highly certain" and ten being "little certainty") how capable they feel they are to complete a certain task at different levels of difficulty. One such system is the Likert-type scales which assess various domains and situations in which a person must assess their capabilities of performing given tasks (Van der Bijl & Shortridge-Baggett, 2001).

One such measure of perceived self-efficacy was designed by Hinckley, Anderson, Patterson, and Craig (unpublished assessment). Since self-efficacy has not been sufficiently studied in the realm of aphasia, no such scale had been formulated previously. Therefore, Hinckley, et. al. (unpublished assessment) devised the Personal Mastery Communication Scale, specifically for individuals with aphasia. This scale centers on measurement of the level of perceived self-efficacy in the following modalities: auditory comprehension, verbal expression, reading, and writing. It was suggested by the authors that measurement of generalized self-efficacy perception (e.g., self-efficacy for effective one-to-one conversations) would be a more accurate measure of overall self-efficacy for communication tasks than a scale targeted toward specific treatment tasks (e.g., picture description).

The Personal Mastery Communication Scale consists of thirty questions which allow the individual to rate their perceived strength of self-efficacy, perceived level of difficulty, and perceived importance of various communication tasks that may be encountered on a daily basis. These areas are measured on a scale of one (i.e., unable to perform the activity, very difficult, and least important) to five (i.e., very sure that he/she can perform the activity, not difficult, and very important). On this measure, ten questions focus on the individual's self-efficacy perception of auditory comprehension abilities, ten questions focus on verbal expression, and ten questions target reading and writing. The scale is given in a structured interview format and was designed to be read and understood by an individual with aphasia. Through analysis of the questions on the Flesch-Kincaid Grade level scale for reading, the scale was found to have an overall reading grade level of 6.7. If an individual is unable to verbally communicate, a visual analog scale was developed. The individual is able to point to the rating he/she perceives for a specific question. Through use of this scale, an individual with aphasia is able to answer questions, which allow the examiner to determine the overall level of perceived self-efficacy. The level of perceived self-efficacy obtained may allow the professional to have a basis of "predicting" performance and therapeutic outcomes for a given language task.

Increasing Mastery: A Flexible Intervention

Various interventions have been formulated for patients with aphasia. It has been argued, however, that many traditional approaches are instructive in

nature, focusing on the use of didactic language, and not allowing for flexibility and creativity of language use on behalf of the individual with aphasia (Kearns, 1985). The inflexible nature of various treatment programs may inhibit patient responses and generalization of learned skills by using language directed specifically towards a certain therapeutic task. In order to promote generalized language and positive mastery experiences, a flexible language program, centered on the patient and his/her use of creative language use may prove to be beneficial. One such program is Response Elaboration Training (RET). RET is a type of "loose training" that has been shown to increase the use of elaborated utterances with patients with aphasia. Developed by Kearns (1985), RET has been acknowledged to promote generalization of expanded verbal productions across contexts, and is effective across aphasia types. RET promotes increased content and length of utterances through building "on patient-initiated utterances" and encouraging "flexible language use" (Wambaugh & Martinez, 2000).

Traditional approaches to aphasia therapy are mostly didactic in nature. In this sense, therapists tend to view only one or two responses to a task as acceptable, and regard a different response given by the patient as incorrect. This approach does not allow for flexibility, creativity, or initiation of topics by the patient. Due to this, the probability of generalization of skills may be lowered (Kearns, 1985). According to Kearns' (1985) philosophy, a type of "loose training" may prove to be more beneficial. Therefore, he developed a type of therapy directed toward patient-initiated utterances, which has been found to

promote creativity and flexibility and, in extension, promote more positive generalization of learned skills. Kearns developed this training program, which he coined Response Elaboration Training (RET), after studying a program implemented in a preschool setting. This program, known as incidental teaching, was developed by Hart (as cited by Kearns, 1985) in order to promote generalization of skills through an interactive, pragmatic approach, based upon modeling of child-initiated utterance. Incidental teaching employs prompting by the clinician to expand utterances, reinforcement of expanded utterances, and use of practical activities to further encourage generalization. Once implemented in a preschool setting, this program was found to be successful and to allow much more flexibility than other traditional treatment programs (Kearns, 1985).

After studying the incidental teaching approach, Kearns developed RET, a similar type program for adults with aphasia. RET emphasizes utterances spontaneously initiated by the patient. Form of the response is not as important, for the clinician expands, shapes, and models the initial response in a type of "forward-chaining" (Kearns, 1985). The following steps are implemented in order to expand upon the patient's initial utterance: 1) elicitation of initial response through presentation of stimulus; 2) expansion, modeling, and reinforcement of the initial response by the clinician; 3) delivery of a "wh" cue to promote further expansion by the patient; 4) presentation of a second model and combination of the two patient responses on the behalf of the clinician; 5) repetition of the

modeled utterance by the patient, and clinician reinforcement of the patient's repetition (Kearns, 1985).

Using a single subject design, Kearns (1985) studied the effectiveness of this intervention method. Thirty black and white line drawings depicting various actions were used to elicit utterances from a patient with moderate-severe Broca type aphasia. Twenty of the drawings were used during therapy sessions while ten pictures were retained for assessment of generalization of skills. With each picture, the steps previously outlined were implemented. Following treatment, it was found that generalization occurred to approximately 50% of untrained stimuli. Overall improvement was also noted on the verbal subtests of the Porch Index of Communicative Ability (Porch, 1967).

The participant receiving therapy in Kearns' study was three-years post onset of stroke and had received traditional speech language therapy approaches previously. It was found that the outcome of RET was more positive than previous treatment outcomes. It was suggested that the traditional approaches may have inhibited his ability to fully express himself. It was also suggested that "his tendency to avoid communicative interactions and…to provide additional information which would continue a communicative exchange may…have been conditioned during prior therapy" (Kearns, 1985, p. 202). It was thought that the flexibility allowed through RET promoted expanded utterances through not limiting the expressions used by the individual (Kearns, 1985).

RET has been found to have positive generalization of responses and stimuli, as well as positive acquisition on the behalf of patients with aphasia (Wambaugh, Martinez, & Alegre, 2001). As cited by Wambaugh, Martinez, and Alegre (2001), Gaddie et. al. found that RET promoted the production of novel content words while retaining efficiency of communication. Conley and Coelho (2003) also found that a combination of RET with semantic feature analysis (a more instructive type of lexical retrieval treatment) aided response elaboration as well as word retrieval. Since the participants did not have restrictions to their use of language, it was found that creative utterances facilitated word retrieval through patient-initiated carrier phrases. Therefore, focus on creative utterances complemented semantic feature analysis in this manner. The result of this combination of treatment methods was found to promote more effective generalization of learned skills (Conley & Coelho, 2003).

Overall, RET has been shown to effectively promote generalization of expanded utterances through allowing the patient flexible responses and creativity. This method of training may then better facilitate expanded and more effective communication than more instructive methods of treatment. As stated by Wambaugh and Martinez (2000, p. 614), “there is more empirical support for the use of RET than for the majority of aphasia treatments”. Allowing the individual with aphasia more flexibility, this treatment may better mimic real-life communication situations and has been demonstrated to be both functionally and pragmatically appropriate for the individual with aphasia.

Combining the RET treatment program with methods to promote self-efficacy may prove to be even more effective for individuals with aphasia. Through facilitation of a patient-directed approach to therapy, self-efficacy may be strengthened due to promotion of additional mastery experiences. A patient-directed treatment approach combined with additional tasks promoting mastery, allowance of vicarious experience and verbal persuasion, and reduction of emotional arousal may be beneficial. This incorporation of potential sources of self-efficacy into a flexible therapeutic program may allow the person to feel more competent in his/her abilities and promote an even stronger outcome.

Progressive Muscle Relaxation: Reduction of Emotional Arousal

In order to reduce the emotional arousal of individuals with aphasia, it may be beneficial to incorporate tasks targeted toward the reduction of negative stressors into a treatment program such as RET. Following a stroke and diagnosis of aphasia, many individuals may experience negative emotional reactions, such as depression, frustration, social isolation, family tension, and anger (Murray & Ray, 2001). As previously discussed, this negative arousal may result in a low level of perceived self-efficacy in the area of communication and functional recovery. In turn, motivation and social interaction may be negatively affected, further affecting cognitive and language skills (Murray & Ray, 2001). Therefore, it is critical that these stressors be targeted in order to promote positive therapeutic outcomes. In the realm of speech-language pathology one method that has been utilized to reduce emotional arousal is relaxation training.

It has been suggested that incorporation of relaxation training into a language therapy program "will reduce the cognitive load produced by…negative emotions so that adults with aphasia have more cognitive resources available to dedicate to language processing" (Murray & Ray, 2001, p.107). Relaxation training has been shown to improve memory, and verbal fluency.

"Progressive muscle relaxation", a relaxation training method formulated by Jacobson (1987), is one such method that may reduce negative stressors. Jacobson (1987) suggested that many sensations of stress and emotional arousal are brought about by various movements (e.g., shiver when think of a cold; move eyes around when thinking of space). It was suggested that a reduction of these movements would bring about a "subsidence of voluntary recollection and reflection" (Jacobson, 1987, p. 74). Also, it was hypothesized that stress brings upon a tenseness in the major muscle groups; a tenseness which may be reduced or diminished through relaxation. James (as cited by Jacobson, 1987), suggested that if there is no physiological tension present, all emotions associated with the tenseness will also be diminished. Based on these assumptions, Progressive Muscle Relaxation techniques were constructed.

Progressive muscle relaxation focuses on the relaxation of a muscle group by the individual followed by a period of familiarizing oneself with all principle muscle groups in the body. Following this period of familiarization, the individual engages in techniques to deeply relax each muscle group. The individual is instructed to tense each muscle group separately and note the feeling of

tenseness. Once the individual recognizes the tenseness, he/she is to let the muscle group go entirely lax. In Jacobson's (1987, p. 77) words, "it is of the greatest importance…to make no effort to relax, for, as he finds, making an effort is being tense". After practice, the individual is able to relax each muscle group to an extreme degree, doing away with all tenseness and, thereby, reducing emotional arousal (Jacobson, 1987).

Incorporation of a method such as progressive muscle relaxation into language treatment for an individual with aphasia may be beneficial. Marshall and Watts (as cited by Murray & Ray, 2001) found progressive muscle relaxation to improve the naming abilities of individuals with moderate-severe aphasia. Incorporation of progressive muscle relaxation into treatment was found to facilitate both confrontation and object-naming, even for more complex and difficult tasks requiring word-retrieval (Murray & Ray, 2001). This finding illustrates the benefits that can be reaped from incorporation of relaxation into treatment. Through incorporation of a relaxation program into aphasia therapy, the professional may find improvements in an individual's level of self-efficacy, which in turn may facilitate more positive treatment outcomes.

As discussed previously, self-efficacy is closely related to the level of achievement a person may expect to accomplish when performing a certain task. This construct has been found to be an accurate predictor of performance, and is correlated with achievement levels and overall motivation. Therefore, self-efficacy should be considered prior to planning an intervention program for an

individual with aphasia. By knowing the individuals level of self-efficacy regarding various language tasks, the speech-language pathologist may be able to more accurately choose a treatment program that would promote a high level of success for the individual. However, perceived self-efficacy of patients with aphasia has not been sufficiently studied. The purpose of the present study is to examine the affects of perceived self-efficacy on an individual's success in treatment for aphasia and whether or not a treatment program including the sources of self-efficacy may promote higher levels of performance in communicative tasks. It was hypothesized that that a high level of perceived self-efficacy would correlate with a positive treatment outcome. A second hypothesis was that incorporation of the four sources of self-efficacy into a known treatment program for aphasia would encourage gains in self-efficacy levels, thereby promoting greater treatment success.

Chapter Two

Methods

Participants

Two individuals, both native-English speakers with nonfluent aphasia, served as participants. Participant one, a sixty-eight-year-old Caucasian female, suffered a left-hemispheric stroke eleven years prior to the study. According to self-report, she was right-handed premorbidly. Participant two, a sixty-five-year-old Caucasian male, suffered a left hemispheric stroke fifteen years prior to the study. Self-report revealed that he was ambidextrous premorbidly, writing primarily with his left hand. Both participants also suffered right hemiparesis resulting from the stroke. Socioeconomic status of the two participants was determined based on Hollingshead's (1975) Four Factor Index. This index formulates a ranked socioeconomic status (SES) level based upon the individual's prior occupation and education level. SES level is ranked on a scale of one (major business and professional) to five (unskilled laborers). Participant one, who had received a high school education, was classified as level 2, a minor professional. Participant two, who had received a Master's degree, was classified as level 1, a major professional.

Diagnosis of type and severity of aphasia was determined through use of the *Boston Diagnostic Aphasia Examination (BDAE)* (Goodglass, Kaplan, &

Barresi, 2001). Diagnosis of aphasia type was determined by the BDAE rating scale profile; severity of aphasia was determined through use of the BDAE severity rating scale. Participant one's performance, as outlined on the BDAE rating scale profile, was consistent with mild Broca type aphasia. Participant two's performance, as outlined on the BDAE rating scale profile, was consistent with moderate-severe Broca type aphasia. Both participants also met the criteria for candidacy for *Response Elaboration Training (RET)* through presence of frequent agrammatisms, lack of functor words, and frequent nouns in conversational speech (Conley & Coelho, 2003).

Design

A single-subject, cross-over experimental design was employed. Through this design, two types of aphasia treatment were administered. The design allowed one to determine trends and changes in performance and how performance differed between the two types of treatment. The design was carried out in the following order: a baseline period, treatment period, intermediary baseline period, second treatment period, and period of final assessment. During the first treatment period, participant one received treatment type one and participant two received treatment type two. The second treatment period was reversed. In this manner, a cross-over design controls for order presentation effects (i.e. allows one to determine if the first type of treatment administered had an effect on the second type of treatment administered) (McReynolds & Kearns, 1983). It was hypothesized that the treatment type

incorporating the four-sources of self-efficacy would yield a more positive treatment outcome regardless of the order presentation.

Materials

Type and severity of aphasia was measured by the *Boston Diagnostic Aphasia Examination-Short Form* (BDAE) (Goodglass, Kaplan, & Barresi, 2001). The BDAE allows one to determine if an individual's language disturbances are characteristic of aphasia symptoms through assessment of the following areas: conversational and expository speech, auditory comprehension, oral expression, reading, and writing (Goodglass, Kaplan, & Barresi, 2001). Subtests, formulated to assess various areas of these categories, are administered to the individual for analysis. Once all subtests are administered, a rating scale profile and aphasia severity rating scale may be obtained. The rating scale profile outlines deficits in articulatory agility, phrase length, grammatical form, prosody, paraphasia, word finding, sentence repetition, and auditory comprehension. Once the rating scale profile is complete, the examiner may determine type of aphasia through profile analysis. The severity rating ranges from 0 ("no usable speech or auditory comprehension") to 5 ("minimal discernible speech handicap; the patient may have subjective difficulties that are not obvious to the listener") (Goodglass, Kaplan, & Barresi, 2001).

Statistical analysis of the *Boston Diagnostic Aphasia Examination* demonstrated that all items in the test have good internal consistency, with reliability coefficients ranging from 0.54 to 0.98. Most reliability coefficients fell

above 0.79, demonstrating that the measures are consistent. Retest reliability varied, however, due to the population of patients tested. Individuals with aphasia have been found to have varied performance on measures from day to day. However, it has been found that "once recovery has stabilized, most aphasic patients will repeat their earlier performance fairly closely on retest" (Goodglass, Kaplan, & Barresi, 2001). Correlations among subtests and categories were also found to be strong, demonstrating that each subtest in a category tests abilities in that category (e.g. the Basic Word Discrimination subtest was found to measure auditory comprehension abilities). The short form of the BDAE has also been demonstrated to have strong correlation, with most coefficients falling in the nineties, with the standard form of the BDAE. Therefore, the short form is an accurate representation of what the individual would score on the standard form (Goodglass, Kaplan, & Barresi, 2001).

Pre-treatment and post-treatment perceived self-efficacy measures were obtained utilizing the *Personal Mastery Communication Scale* (Anderson, Hinckley, & Craig, 1992). This equal-interval rating scale consists of thirty statements directed toward various language tasks such as carrying on a telephone conversation. The development of the *Personal Mastery Communication Scale* was based on Bandura's social cognitive theory and construct of self-efficacy. Items included in the *Personal Mastery Communication Scale* were chosen based on importance for independent functioning, as determined by recent literature (Hinckley, Anderson, Patterson, &

Craig, unpublished manuscript). Once possible items were formulated, a group of certified speech-language pathologists ranked the items from least to most difficult. This ranking determined the order presentation for the items (from easy to difficult). Construct validity for the Personal Mastery Communication Scale was found to be strong, with 100% agreement of choice of items by the same group of speech-language pathologists. Test-retest reliability was good, with individuals who were found to have communication measures stable over time (Hinckley, Anderson, Patterson, & Craig, unpublished manuscript). As previously discussed, individuals with aphasia may experience various patterns of performance from day-to-day.

Utilization of the *Personal Mastery Communication Scale* allowed measurement of perceived self-efficacy of the participants in the following modalities: auditory comprehension (e.g., "Can you understand one-to-one conversations?"), verbal expression (e.g., "Can you express yourself in one-to-one conversations?"), reading (e.g., "Can you read and understand recipes?"), and writing abilities (e.g., "Can you write letters to friends or family members?"). Using this measure, participants were instructed to first answer whether or not they could perform a specific communication task, such as obtaining a person's attention. If they felt they were able to carry out the task, they were then asked to rate their perceived ability to carry out each task on a scale of two (somewhat sure) to five (absolutely sure). If the participant first stated they were unable to perform the task, the level of perceived ability was scored as one and the

examiner proceeded with the next question. If the participant was untestable for a question, the level of difficulty was scored as zero and the examiner proceeded with the next question. Following this, the participants rated the perceived level of individual difficulty they experienced when carrying out the task on a scale of one (difficult) to five (easy). Finally, the participants rated the level of perceived importance of the task on a scale of one (not at all important) to five (very important). Instructions for this task were read as written by Anderson, Hinckley, & Craig (1992), to ensure each participant received the same direction. A daily probe consisting of a shorter version of the *Personal Mastery Communication Scales* was also utilized (Anderson, Hinckley, & Craig, 1992). This scale contained 10 statements directed toward verbal expression language tasks and was rated in the same manner as the larger scale. The scale was presented four times over the course of the study, with the questions presented in random order.

The *Communicative Abilities in Daily Living—2nd Edition (CADL-2)*, was utilized to measure communicative abilities throughout the study periods (Holland, Frattali, & Fromm, 1999). This measure assesses interpersonal interaction and communicative responses to daily problems such as making an outgoing call to a place of business in order to make an appointment (Davis, 2000). Criterion-related validity was found to be strong for the CADL-2. This was found through comparing scores obtained on the CADL-2 with the aphasia quotient score on the *Western Aphasia Battery* (Kertesz, 1982). A moderate-high correlation was found, suggesting that the CADL-2 measures a construct

associated to language functions as revealed by a standardized assessment of aphasia (Holland, Frattali, & Fromm, 1999). The strong criterion-related validity allows one to assume that performance on the CADL-2 may be a predictor of overall language performance. Also, individuals with aphasia were found to score significantly lower than non-brain damaged individuals, performance on individual items correlated with overall test performance, and examiners ratings of the individuals communication deficits correlated with overall test performance. These three findings indicate that the CADL-2 has good construct validity, illustrating the relationship between the test items and the theoretical basis of the test. The CADL-2 was also found to have good content validity through meeting psychometric standards and containing items based upon current theories surrounding communicative abilities (Holland, Frattali, & Fromm, 1999). Test-retest reliability of the CADL-2 was found to be strong, with a reliability coefficient of .89. A content reliability coefficient of .93 was found for the measuring, demonstrating internal consistency. Inter-rater reliability was also found to be strong, with a correlation coefficient of .99. Therefore, the CADL-2 has been found to have strong reliability and validity for measurement of communicative abilities (Holland, Frattali, & Fromm, 1999). This assessment was administered following the first baseline period, the intermediary baseline period, and the withdrawal period.

The first type of treatment was traditional *Response Elaboration Training* (RET). This period consisted of ten one-hour and ten minute sessions, which

included five to ten minutes of spontaneous conversation and one hour of RET. RET, as noted previously, is a type of "loose training" which works to improve lexical retrieval and the number of content words produced by an individual with aphasia (Conley & Coelho, 2003). This treatment method focuses on initiation of responses and conversation through the use of forward chaining, or elaboration of the client's responses by the clinician. In this method, the following steps are employed: (1) an elicited verbal response to a picture; (2) reinforcement followed by a model and shaping of the initial response; (3) Wh-cue to obtain elaboration of initial response; (4) a second reinforcement followed by a model and shaping of the two responses; (5) a request for repetition preceded by a model; and (6) an elicited delayed imitation of the two responses (Davis, 2000). Kearns (1985) has demonstrated that RET is an effective intervention program for improving verbal production in conversation and for generalization of improved skills across types of aphasia.

The second type of treatment was a supplemented version of *Response Elaboration Training,* including the four sources of self-efficacy (RET+SE). This period consisted of ten one and one-half hour sessions. Each session began with ten minutes of spontaneous conversation to obtain a discourse sample. Conversation was followed by 10 minutes of relaxation training through Progressive Muscle Relaxation techniques (Jacobson, 1987) to promote positive emotional arousal through reduction of negative stressors. Approximately forty-five minutes of RET was then employed. During this period, verbal persuasion

through the use of verbal praise was given. Following this, a five-minute video was presented. Each portion of the video illustrated a successful conversation made by an individual with a nonfluent aphasia in order to promote a positive vicarious experience. The following videos were used: portions of a lecture given by two individuals from England, who both had aphasia; and portions of a comedic stand-up routine given by a gentleman with aphasia. A five to ten minute discussion regarding participant impressions of the video then ensued. Following this, the session concluded with a ten-minute spontaneous conversation with an unfamiliar partner, to provide each participant positive mastery experiences (Bandura, 1977).

Procedures

Two types of aphasia treatments were administered to each participant. The first type of treatment followed the traditional RET approach, and the second, RET+SE. For participant one, each baseline, treatment, and withdrawal period was conducted in a quiet setting at a University clinic. Participant two was unable to attend sessions regularly at the University clinic. Therefore, baseline, treatment, and withdrawal periods were conducted at his home and in the clinic.

The initial baseline period lasted for two one and one-half hour sessions. Each session during this period began with a five to ten minute spontaneous conversation, regarding the participant's interests, prior work experience, and hobbies, to elicit a connected speech sample. Once the sample was obtained, correct information unit (CIU) analysis was performed. This analysis allowed for

determination of the participant's informativeness and efficiency of connected speech. The analysis was carried out through formulation of the time of sample, participant speaking time, number of words in sample, words per minute (WPM), number of CIUs in sample, percent of CIUs in sample, and CIUs per minute (Oelshlaeger & Thorne, 1999). During this period, the *Boston Diagnostic Aphasia Examination-Short Form* (Goodglass, Kaplan, & Barresi, 2001), the *Communicative Abilities in Daily Living-2, and the Personal Mastery Communication Scales* (Anderson, Hinckley, & Craig, 1992) were also administered to each participant.

Once the initial baseline period was complete, a treatment period of ten one and one-half hour sessions commenced. During this period, participant 1 received the traditional version of *Response Elaboration Training*. Participant 2 received RET+SE. Each participant rated his/her perceived relaxation level by utilizing the relaxation rating scale, two times during each session. A five to ten-minute conversational discourse sample was obtained at the beginning of each session in order to measure progress of language abilities. These samples were also evaluated using the aforementioned CIU analysis. Following the conversation, participant one received RET. In order to elicit responses for RET, ten to fifteen pictures depicting various activities and people were shown. The steps outlined for RET were then employed. Participant one received ten minutes of progressive muscle relaxation followed by RET. In order to elicit responses for RET, five to ten pictures depicting various people and activities

were shown. The above steps were then employed to promote the formulation of elaborated sentences. Since this treatment type incorporated more activities to promote perceived self-efficacy, less time was allotted for RET, therefore, fewer pictures were shown during this treatment. Following RET, the participant viewed a five-minute videotape. The session was completed by conversation with an unfamiliar partner. Upon completion of the treatment period, an intermediary baseline period of two one and one-half hour sessions ensued. During this period, a five to ten minute spontaneous conversation sample was obtained and evaluated through CIU analysis. Also, the *Boston Diagnostic Aphasia Examination,* the *Communicative Abilities of Daily Living-2,* and the *Personal Mastery Communication Scales* were administered to each participant. Each participant completed the relaxation rating scale one to two times each session.

Following the intermediary baseline period, a second treatment period began. This period consisted of ten one and one-half hour sessions. During this time, participant 1 received RET+SE, while participant 2 received the traditional version of RET. Discourse samples were obtained at the start of each session and evaluated through CIU analysis. Both participants completed the relaxation rating scale at the beginning and end of each session.

A withdrawal period of two one and one-half hour sessions was then employed. During this period, five to ten minute discourse samples were obtained through spontaneous conversation and evaluated through CIU analysis. The *Boston Diagnostic Aphasia Examination* was re-administered. Upon

completion of the withdrawal period, each participant utilized the 30-statement *Personal Mastery Communication Scales* in order to measure changes in perceived self-efficacy. In order to measure overall language progress, the *CADL-2* was also re-administered.

Reliability of the Dependent Variables

Interrater reliability was determined for transcription of conversational samples, CIU analysis, and standardized testing. Ten percent of all samples were analyzed via videotape by two certified speech-language pathologists and one graduate student. Once analyzed, the results obtained through this analysis were compared to the results obtained by the examiner. Results of the comparison showed 90% agreement for transcription and 88% agreement for CIU analysis.

Reliability for transcription was determined through review of five videotaped sessions by a graduate student. The sessions reviewed were randomly selected from the fifty-two total sessions (i.e., testing and treatment sessions with both participants). Included in this sample was two sessions with participant one and three sessions with participant two. Two sessions from the traditional RET treatment and three sessions from the RET+SE treatment were randomly selected.

The graduate student reviewing the sessions orthographically transcribed the language sample obtained during each session. This transcription was then compared with the orthographic transcription completed by the examiner. A

point-to-point correspondence was generated through calculation of the number of words agreed on across the two compared transcriptions. Once the number of words agreed upon was determined, the number was divided by the total number of words compared, to yield a percentage agreement. Ninety percent of the total words transcribed were agreed upon by the two raters.

Reliability for CIU analysis was determined through review of five orthographically transcribed language samples by a certified speech-language pathologist. The language samples were randomly selected from the fifty-two total language samples (i.e., samples from testing and treatment sessions with both participants). Included in this sample was two sessions with participant one and three sessions with participant two. Two sessions from the traditional RET treatment and three sessions from the RET+SE treatment were randomly selected.

The speech-language pathologist reviewing the samples performed an analysis in accordance to Nicholas and Brookshire's (1993) correct information unit analysis. Once the analysis was completed, a comparison with the CIU analysis performed by the examiner was executed. A point-to-point correspondence was generated through calculation of the number of words, words per minute, CIUs, percentage of CIUs and CIUs per minute agreed on across the two compared analyses. Once these numbers were determined, the numbers were divided by the total number of words, words per minute, CIUs, percentage of CIUs, and CIUs per minute compared, to yield a percentage

agreement. This comparison yielded the following results: 99% agreement for number of words; 90% agreement for words per minute; and 85% agreement for CIUs, percentage of CIUs, and CIUs per minute. An average of the agreement percentages was obtained to yield an overall reliability score for CIU analysis. Overall, 88% of scores were agreed upon by the two raters.

Reliability of the Independent Variable, or Treatment Integrity

Treatment integrity was determined through review of six videotaped sessions by a certified speech-language pathologist. The sessions analyzed were randomly selected from the twenty treatment sessions conducted. Included in this sample was four sessions with participant one and two sessions with participant two. Of the six sessions reviewed, three were of sessions during the RET traditional phase, and the other three were from sessions during the RET+SE phase. The overall treatment integrity for this study was 100%.

For sessions occurring during the RET traditional phase, the RET steps were characterized as having occurred or not occurred for each picture item presented. These steps included: 1) picture used, 2) initial response, 3) reinforcement, model, shape 4) wh- cue, 5) combined reinforcement, model, shape 6) second model repetition, 7) delayed imitation of combined response. One hundred percent of these steps were present in all of the RET traditional sessions observed.

For sessions that occurred during the RET+SE phase, all of the seven steps listed in the preceding paragraph were coded for occurrence or non-

occurrence. In addition, the occurrence of relaxation training, enhanced verbal reinforcement, observation of video/vicarious observation, and mastery experience with an unfamiliar conversational partner were also coded for occurrence or non-occurrence. One hundred percent of all of the RET+SE components were present in all rated sessions.

Chapter Three

Results

Participant One

Pre-Test

Results of the BDAE

Results of the BDAE for participant one were consistent with a mild Broca type aphasia. According to the BDAE rating scale, participant one presented with clumsy and effortful speech at times throughout the evaluation. Her longest phrase length in conversational speech consisted of seven to ten words. Performance on the description of the Cookie Theft picture revealed speech with incomplete grammatical forms characterized by a lack of necessary functor words and agrammatical speech. She did not evidence use of paraphasias in running speech, but did exhibit moderate anomia. Severity level was rated as 3, illustrating her ability to “discuss almost all everyday problems with little or no assistance” but difficulty with discussion of other information due to speech limitations (see Table 1).

Table 1

BDAE Scores: Participant One

	Testing Period		
Subtest	Pre-testing	Intermediary	Post-testing
Severity Rating	3	3	4
Fluency—Phrase Length	7	7	7
Fluency—Melodic Line	5	5	5
Fluency—Grammatical Form	4	5	6
Conversation/Expository Speech	7	6	7
Auditory Comprehension—Basic Word Discrimination	15	15	16
Auditory Comprehension—Commands	8	8	8
Auditory Comprehension—Complex Ideational Material	6	6	6
Articulatory Agility	4	4	4
Recitation—Automatized Sequences	4	4	4
Repetition—Words	5	5	5
Repetition—Sentences	2	2	2
Responsive Naming	10	10	10
Boston Naming Test	15	14	15
Naming—Special Categories	12	12	12
Paraphasia—rating	7	7	7

Table 1

BDAE Scores: Participant One—Page 2

	Testing Period		
Subtest	Pre-testing	Intermediary	Post-testing
Paraphasia—phonemic	0	0	0
Paraphasia—verbal	0	0	0
Paraphasia—neologistic	0	0	0
Paraphasia—multi-word	0	0	0
Reading—Matching cases and scripts	4	4	4
Reading—Number matching	4	4	4
Reading—Picture-word matching	4	4	4
Oral word reading	15	15	15
Oral sentence reading	4	5	5
Oral sentence comprehension	3	3	3
Reading—Sentence/Paragraph	4	4	4
Writing—Form	12	11	11
Writing—Letter Choice	19	15	18
Writing—Motor Facility	7	7	7
Writing—Primer Words	4	4	4
Writing—Regular Phonics	2	2	2
Writing—Common Irregular Words	3	2	3
Writing—Written Picture Naming	4	4	4
	44		

Table 1

BDAE Scores: Participant One—Page 3

	Testing Period		
Subtest	Pre-test	Intermediary	Post-test
Narrative Writing	11	9	10

Results of the CADL-2

Participant one obtained an overall score of 94, indicative of a high level of functional communication. The raw score placed her in the 95th percentile of performance (see Table 2). She accurately performed communication tasks related to activities of daily living, such as creating a grocery list and describing an illness to a doctor. Difficulty was evidenced in writing her correct address and attaining accurate information from a community bus schedule.

Table 2

CADL-2 Scores: Participant One

	Testing Period		
Score Type	Pre-testing	Intermediary	Post-testing
Raw Score	94	96	97
Percentile Rank	95	97	98
Stanine Score	9	9	9

Results of the Personal Mastery Communication Scales

Averages were obtained for the participants responses for level of Mastery, acquired through the question “How sure are you that you can perform the communication task”, level of difficulty, and level of importance for each modality (auditory comprehension, verbal expression, reading, and writing). The averages represent the participant’s overall level of perceived mastery, perceived difficulty experienced, and perceived level of importance for each modality on the same five point rating scale (one being least mastery, most difficulty, and least important and five being most mastery, least difficulty, and most important). Results of this scale revealed participant one to perceive the most mastery in reading. She provided an average mastery rating of five for this modality. Mastery ratings for all modalities were high, however, ranging from 4.2 (auditory comprehension) to 4.8 (reading). She rated mastery of verbal expression, on average, as 4.6. Perceived level of difficulty ratings ranged from 3.7 (verbal expression) to 4.6 (writing). Average ratings for importance of communication tasks ranged from 3.8 (auditory comprehension) to 4.6 (verbal expression, reading, and writing) (see Figure 1, Figure 2, Figure 3, Figure 4).

Figure 1. Participant one: auditory comprehension level of mastery obtained during testing periods

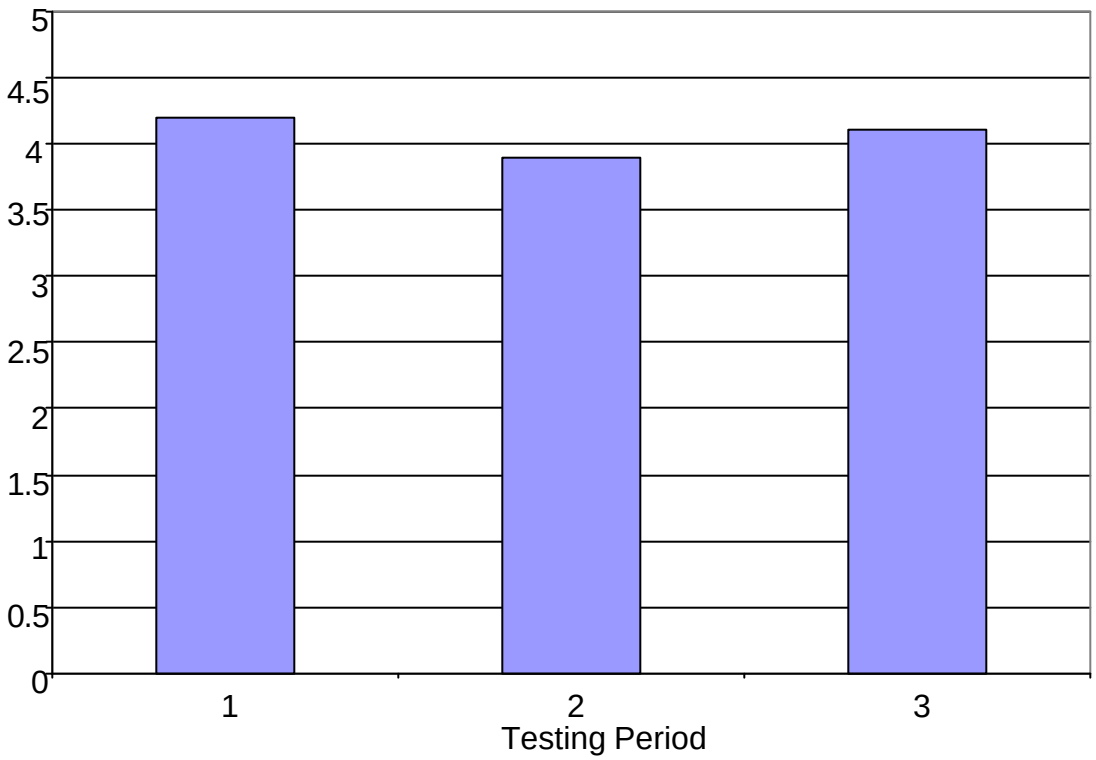


Figure 2. Participant one: verbal expression level of mastery obtained during testing periods

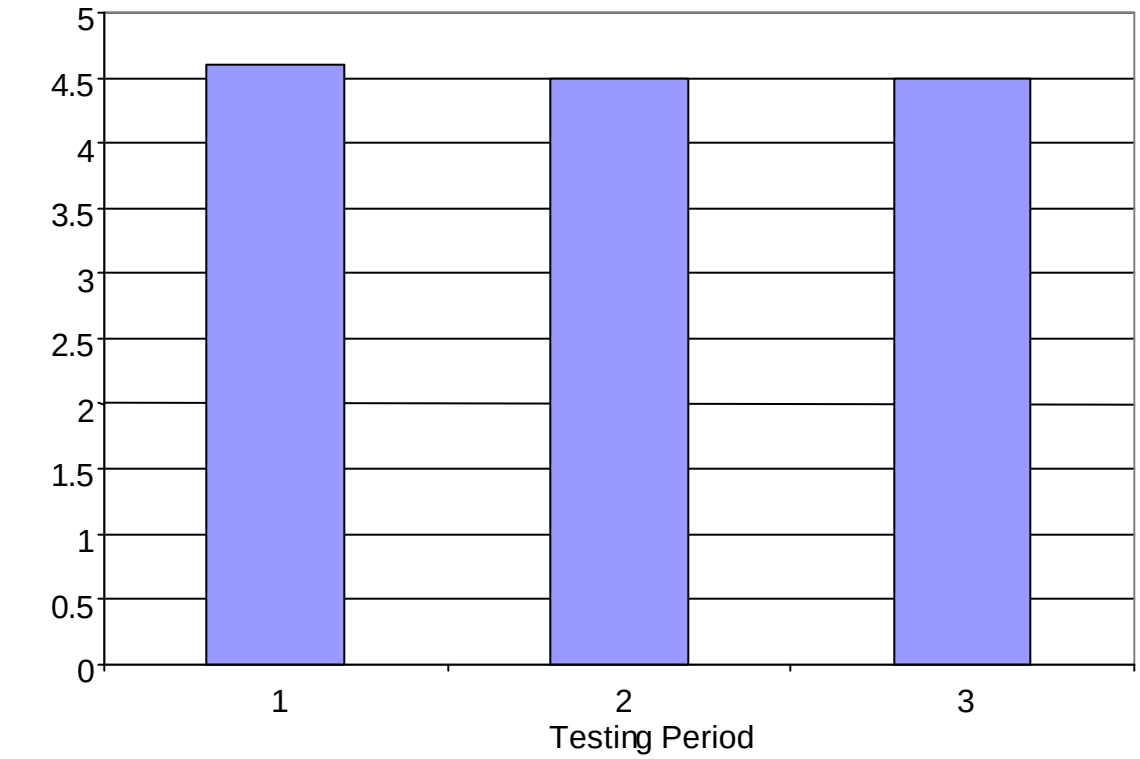


Figure 3. Participant one: reading level of mastery obtained during testing periods

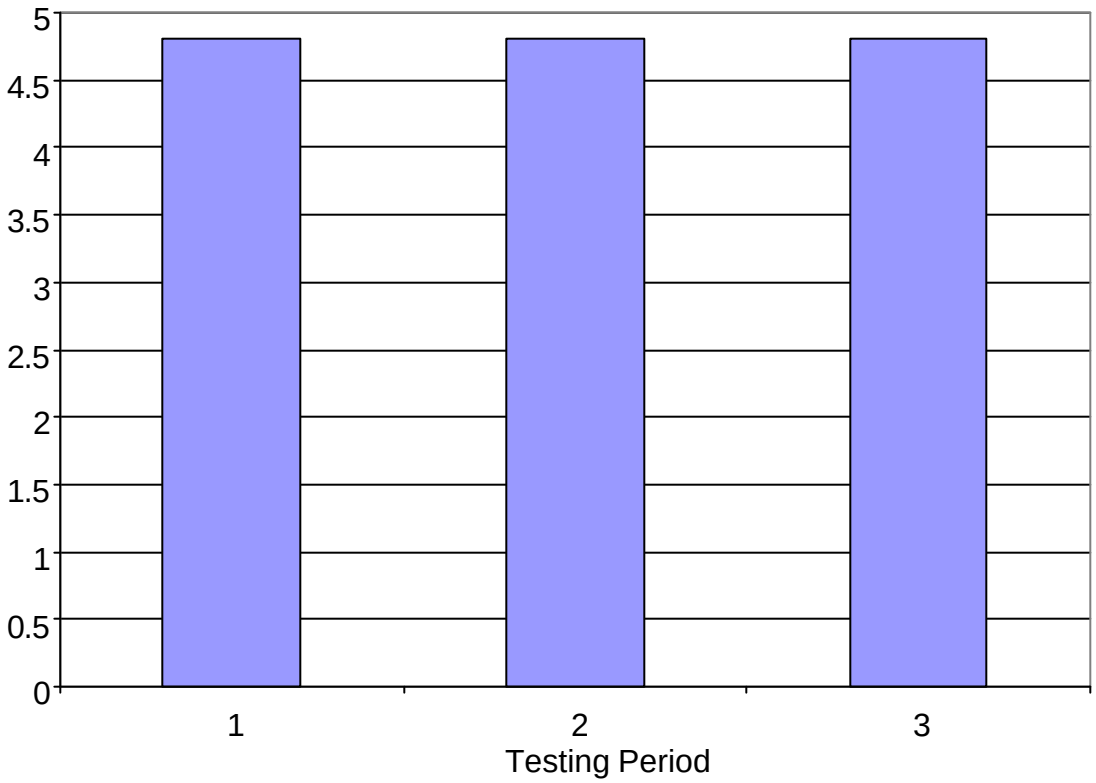
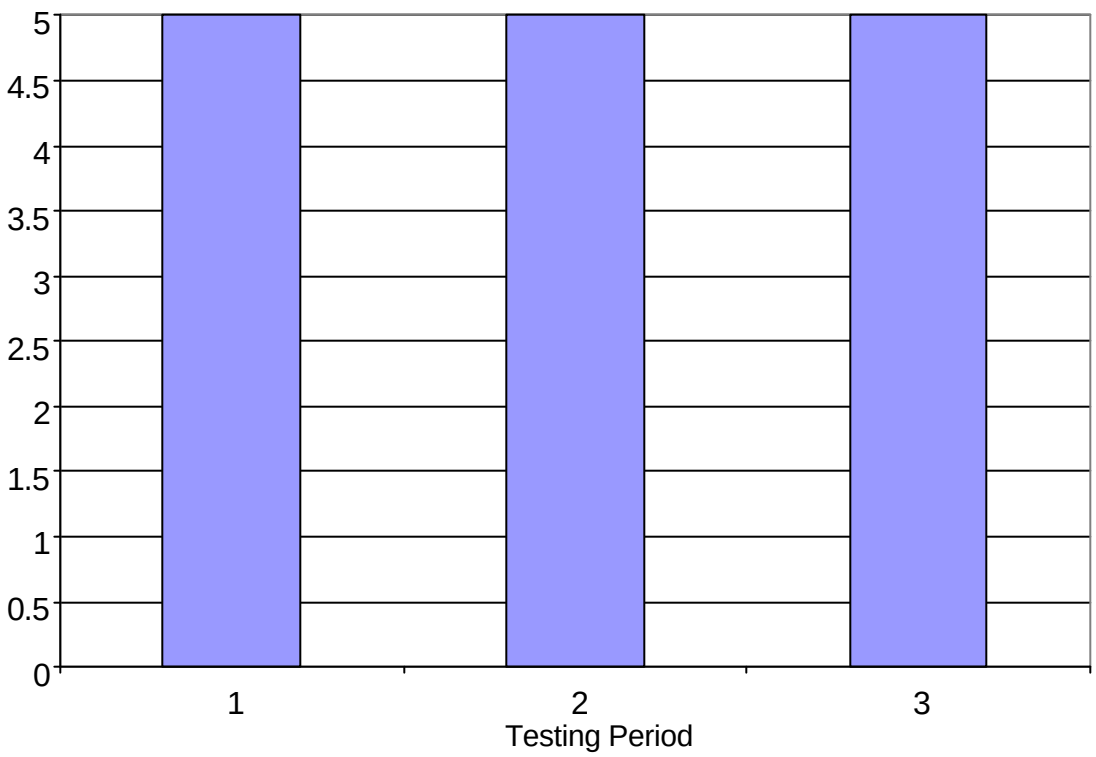


Figure 4. Participant one: writing level of mastery obtained during testing periods



Results of CIU Analysis

These results demonstrate that, at baseline, participant one had a high level of perceived mastery for all modalities. Verbal expression was perceived to be the most difficult modality for her. However, all ratings continued to be relatively high for all modalities. Importance levels were also high, with auditory comprehension to be perceived as the least important modality.

Conversational samples obtained from each participant were analyzed according to Nicholas and Brookshire's (1993) Correct Information Units (CIUs). This analysis allowed formulation of number of words, number of CIUs, words per minute, CIUs per minute, and a CIU percentage score. During the baseline period, conversational samples obtained for participant one yielded an average of 83.5 CIUs and 122 words. On average, she produced 29.75 words per minute and 20.95 CIUs per minute. The average CIU percentage score for the baseline period was 70.5. As outlined in a study by Nicholas and Brookshire (1993), non-brain damaged individuals were found to produce no less than 125 words per minute, 107 CIUs per minute, and have a CIU percentage score of no less than 76. In accordance to this data, participant one was below all non-brain damaged cut-off scores. The average CIU percentage score illustrates that she produced informative and effective communication 70.5 percent of the time, formulating 20.95 informative units per minute (see Figure 5, Figure 6).

Figure 5. Participant one: percentage of CIUs obtained during testing periods

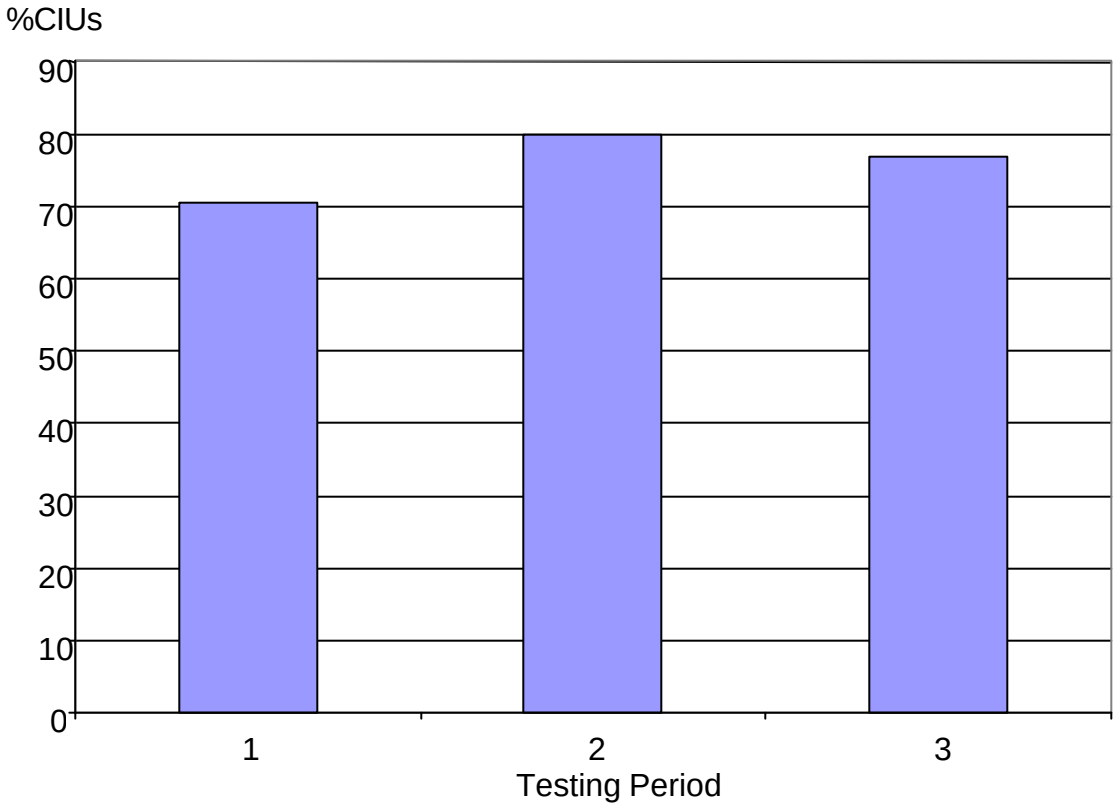
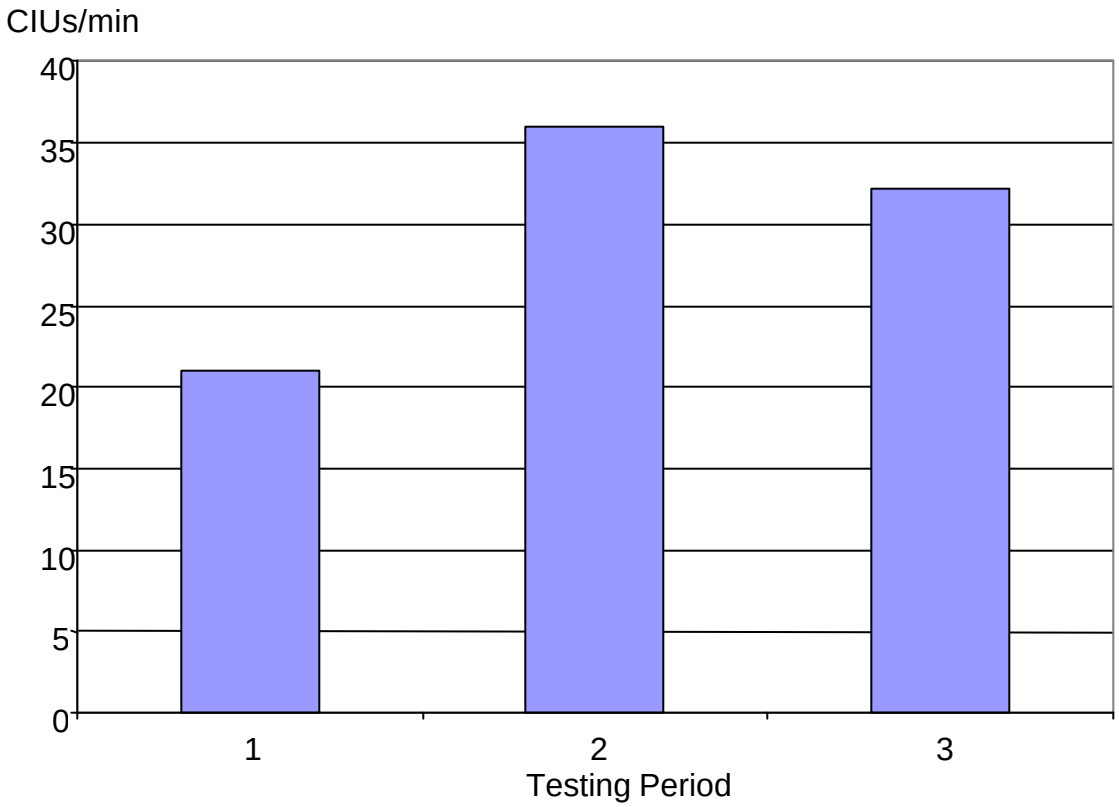


Figure 6. Participant one: CIUs per minute obtained during testing periods



Treatment Period One

During this period, participant one received the traditional version of RET.

Results of CIU Analysis

A conversation sample was obtained each session, totaling ten conversation samples for the treatment period. CIU analysis was performed on each sample, and the number of words, number of CIUs, words per minute, CIUs per minute, and CIU percentage scores were averaged. Over the course of the ten sessions, participant one produced an average of 155.4 words and 110.7 CIUs in each sample. Her average words per minute score was 30.91 and average CIU per minute score was 21.86 over the course of the first treatment period. The average CIU percentage score for participant one was 71. The results indicate a slight improvement in the CIU per minute score and the CIU percentage score (i.e., from baseline to treatment period one). The CIU per minute score for this period reflected an increase of 0.91 CIUs per minute; the CIU percentage score increased by 0.5%.

Results of the Personal Mastery Communication Scales-Probe

The Personal Mastery Communication Scales-Probe consisted of ten questions targeting verbal expression (e.g. “Can you get the attention of a family member or friend”). This probe was given twice during the ten treatment sessions and was analyzed in the same manner as the standard Personal Mastery Communication Scales. Results of the probe revealed that participant one had an average mastery rating of 4.4, difficulty level of 3.6, and importance

level of 4.6. According to these ratings, participant one had a high level of mastery and importance in the area of verbal expression. However, according to this scale, perceived difficulty with verbal expression was greater than perceived mastery. In other words, she felt as if she could perform most verbal expression tasks, but some tasks may be difficult to accomplish.

Intermediary Period

Results of the BDAE

Results of the BDAE remained consistent with Broca aphasia for participant one. Grammatical form of conversational speech slightly improved, with less use of agrammatisms. Agrammatisms and lack of functor words remained evident throughout the evaluation, however. Overall severity level was rated as a four, reflecting her improved use of syntax and increase in utterance length. Phrase length, at times, exceeded fifteen words. All other scores on the BDAE rating profile remained consistent with baseline measures (see Table 1).

Results of the CADL-2

Participant one's performance on the CADL-2 during this period revealed a slight improvement from previous performance. The participant obtained a raw score of 96, indicating a high level of functional communication skills (see Table 2). She was able to perform communication tasks required of daily living activities (e.g., asking where to find an item in a store). Difficulty was demonstrated with activities such as choosing appropriate identification to show a receptionist at the doctor's office.

Results of the Personal Mastery Communication Scales

Results of the thirty-statement Personal Mastery Communication Scales revealed participant one to have relatively high perceived mastery levels in all areas, with average ratings ranging from 3.9 (Auditory Comprehension) to 4.8 (Reading). Difficulty levels were also high, ranging from 3.9 (Auditory Comprehension) to 4.6 (Reading and Writing), illustrating a low level of perceived difficulty with communication tasks. Difficulty ratings in the area of verbal expression reflected a 0.7 point increase from the pre-test period, indicating a slightly lower level of perceived difficulty with verbal expression tasks. All other ratings were consistent with ratings obtained during the pre-testing period. Levels of importance were also high, ranging from 4 (Auditory Comprehension) to 5 (Writing). There were no apparent differences between the levels of importance of the pre-testing period and the levels of importance of the intermediary period (see Figure 1, Figure 2, Figure 3, Figure 4).

Results of CIU Analysis

During this period, two conversation samples were obtained, one per session. Results of the CIU analysis for each sample were averaged. Participant one produced an average of 121 words and 96.5 CIUs during this period. On average, she produced 45.2 words per minute and 36.03 CIUs per minute. Her average CIU percentage score was 80. These results reflect improvement in both the CIUs per minute and CIU percentage score. During this period, an increase of 15.08 CIUs per minute from pre-testing and 14.17 CIUs

per minute from treatment period one was evident. Also, an increase of 9.5% from pre-testing and of 9.0% from treatment period one was also reflected in the CIU percentage score obtained during this period (see Figure 5, Figure 6).

Treatment Period Two

During this period, participant one received RET+SE.

Results of CIU Analysis

The average of the ten conversation samples obtained during the second treatment period revealed participant one to produce 167.3 words and 129.1 CIUs. Following timing of the samples, it was found that participant one, on average, generated 33.15 words per minute and 25.13 CIUs per minute. Her average CIU percentage score for this period was 77. The CIUs per minute and CIU percentage score did decrease during this period from the intermediary period. However, a general trend in improvement for CIUs per minute the CIU percentage score was evidenced throughout this treatment period.

Results of the Personal Mastery Communication Scales-Probe

Results of the Personal Mastery Communication Scales-Probe revealed participant one to have an average perceived mastery level of 4.6 for verbal expression. She rated perceived difficulty of verbal expression tasks, on average, as 4.5, and perceived importance, on average, as 4.7. The probe revealed a general trend of improvement in the perceived level of difficulty. All other ratings remained within 0.2 of previous ratings.

Post-Testing

Results of the BDAE

Post-testing results of the BDAE remained consistent with Broca aphasia for participant one. The results of this administration did not change significantly from intermediary testing. Use of agrammatisms and lack of functor words remained evident. Overall severity level was again rated as a four. Improvement was noted in the participant's phrase length, however, exceeding twenty words at times. Slight improvement was also noted for basic word discrimination and writing of irregular words. All other scores on the BDAE rating profile remained consistent with intermediary measures (see Table 1).

Results of the CADL-2

Participant one obtained a raw score of 97 on the final administration of the CADL-2, again indicating a high level of functional communication. Her performance fell in the 98th percentile (see Table 2). Minor improvement was noted during this administration. She was able to accurately attain information from a community bus schedule; she demonstrated difficulty with this task previously. However, the improvement was not clinically significant.

Results of the Personal Mastery Communication Scales

Averages of the thirty statement Personal Mastery Communication Scales revealed participant one to have high perceived mastery levels for all communication tasks, with ratings ranging from 4.1 (auditory comprehension) to 5 (writing). Mastery of verbal expression was rated as 4.4. Perceived levels of

difficulty were low for participant one, ranging from 4 (auditory comprehension) to 4.8 (reading). Perceived levels of importance for communication tasks were high in all modalities, ranging from 4.2 (auditory comprehension) to 5 (writing) for participant one. All ratings were consistent with the ratings obtained during the intermediary period (i.e., did not differ by more than 0.2) (see Figure 1, Figure 2, Figure 3, Figure 4).

Results of CIU Analysis

Two conversation samples, one per session, were obtained during this period. Averages of the two samples revealed participant one to produce 150 words and 117 CIUs, yielding a CIU percentage score of 77. She produced, on average, 42.38 words per minute and 32.16 CIUs per minute. Increases of 11.21 CIUs per minute and 6.5% (i.e., the CIU percentage score) were evident from the pre-testing period (see Figure 5, Figure 6).

Participant one: Summary of Results

Participant one evidenced a slight improvement in level of severity on the BDAE following the traditional RET treatment (see Table 1). Also, a slight increase was noted in the CADL-2 score following both treatment periods (see Table 2). Overall performance on these measures, however, remained consistent for all testing periods. Ratings on the PCMS revealed participant one to have a high perceived level of mastery in all modalities throughout the study (see Figure 1, Figure 2, Figure 3, Figure 4). She also evidenced a general trend

in improvement throughout the study for CIUs per minute and the CIU percentage score (see Figure 5, Figure 6).

Participant Two

Pre-Test

Results of the BDAE

Results for participant two were consistent with moderate-severe Broca type aphasia. In accordance with the BDAE rating scale, he presented with slightly impaired articulatory agility. His longest phrase length in conversational speech consisted of four words, with impaired syntax. Conversation was characterized by frequent agrammatisms and lack of functor words, using primarily content words. Difficulty with word retrieval was evident throughout the evaluation. Severity level was rated as 1, illustrating his conversational ability was limited to “fragmentary expression” (see Table 3).

Table 3

BDAE Scores: Participant Two

	Testing Period		
Subtest	Pre-testing	Intermediary	Post-testing
Severity Rating	1	2	2
Fluency—Phrase Length	4	3	5
Fluency—Melodic Line	3	3	4
Fluency—Grammatical Form	3	4	4
Conversation/Expository Speech	5	4	7
Auditory Comprehension—Basic Word Discrimination	14	13.5	14
Auditory Comprehension—Commands	0	6	3
Auditory Comprehension—Complex Ideational Material	3	1	3
Articulatory Agility	6	6	6
Recitation—Automatized Sequences	3	4	4
Repetition—Words	5	5	5
Repetition—Sentences	2	1	2
Responsive Naming	7	6	5
Boston Naming Test	14	12	14
Naming—Special Categories	11	11	10
Paraphasia—rating	7	7	7

Table 3

BDAE Scores: Participant Two—Page 2

	Testing Period		
Subtest	Pre-testing	Intermediary	Post-testing
Paraphasia—phonemic	0	0	0
Paraphasia—verbal	0	0	0
Paraphasia—neologistic	0	0	0
Paraphasia—multi-word	0	0	0
Reading—Matching cases and scripts	4	4	4
Reading—Number matching	4	4	4
Reading—Picture-word matching	2	3	3
Oral word reading	15	15	12
Oral sentence reading	2	4	2
Oral sentence comprehension	1	1	2
Reading—Sentence/Paragraph	4	4	4
Writing—Form	10	14	14
Writing—Letter Choice	10	17	19
Writing—Motor Facility	10	14	14
Writing—Primer Words	1	2	2
Writing—Regular Phonics	0	1	0
Writing—Common Irregular Words	0	2	3

Table 3

BDAE Scores: Participant Two—Page 2

	Testing Period		
Subtest	Pre-testing	Intermediary	Post-testing
Writing—Written Picture Naming	2	2	2
Narrative Writing	6	4	6

Results of the CADL-2

Participant two received a score of 86 on the first administration of the CADL-2, indicating a moderate level of functional communication. His performance fell in the 78th percentile (see Table 4). He was able to verbally express personal information (e.g., full name, previous work) and to perform various other daily communication tasks (e.g., specifying items he would like from a restaurant menu). Difficulty was evidenced in tasks such as obtaining information from a building directory, completing an identification form for the doctor, and reporting the time and temperature to the examiner (i.e., after telephoning a local line that informs one of the current time and temperature).

Table 4

CADL-2 Scores: Participant Two

	Testing Period		
Score Type	Pre-testing Period	Intermediary	Post-testing
Raw Score	86	93	93
Percentile Rank	78	94	94
Stanine Score	7	8	8

Results of the Personal Mastery Communication Scales

Results of the scale revealed participant two to perceive the most mastery in reading, with an average rating of 3.4. Mastery ratings ranged from an average of 1.2 (writing) to 3.4 (reading). He rated mastery of verbal expression, on average, as 2.7. Perceived level of difficulty average ratings ranged from 1 (writing) to 3.4 (reading). His range of ratings for importance, on average, was 1 (writing) to 3.4 (reading).

Overall, participant two demonstrated a low level of perceived mastery in all modalities. Difficulty and importance levels were also low. However, he did show moderate perceived mastery, level of difficulty, and importance in reading (see Figure 7, Figure 8, Figure 9, Figure 10).

Figure 7. Participant two: auditory comprehension level of mastery obtained during testing periods

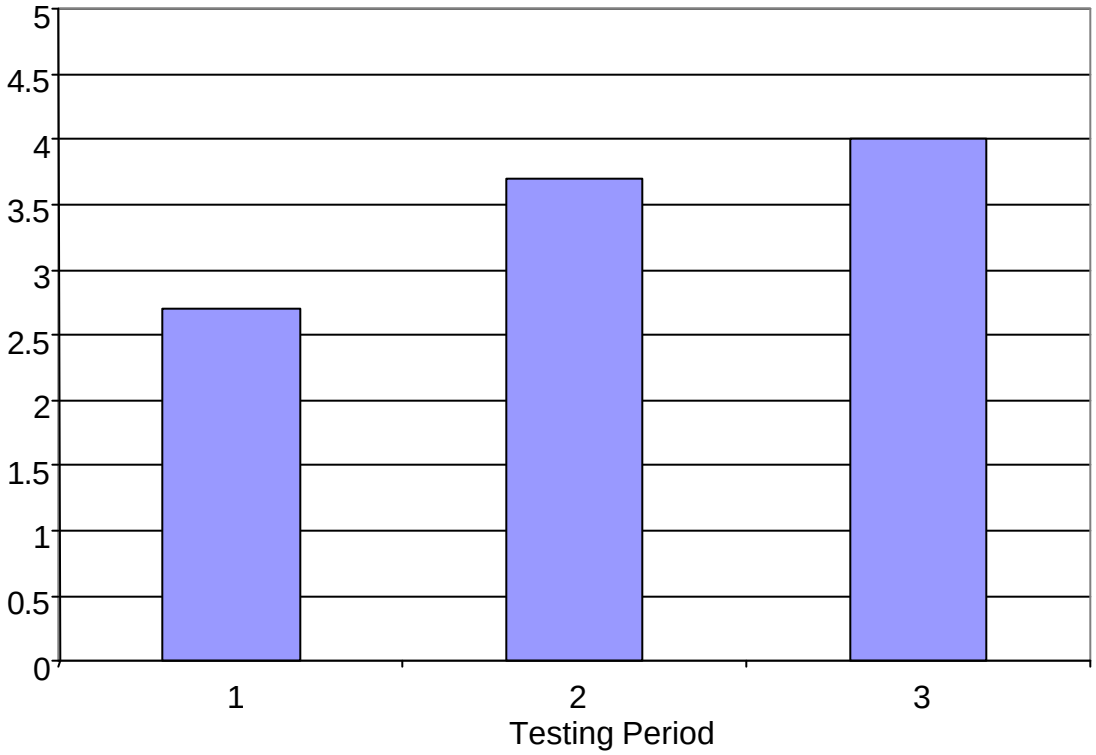


Figure 8. Participant two: verbal expression level of mastery obtained during testing periods

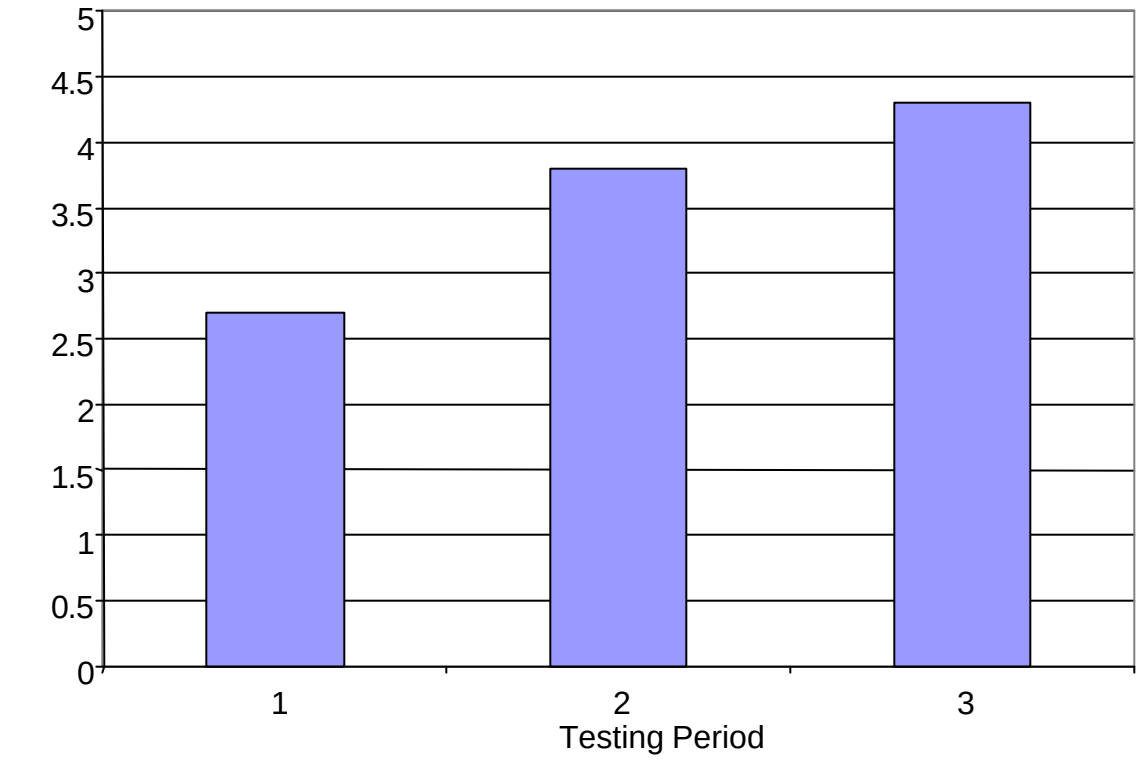


Figure 9. Participant two: reading level of mastery obtained during testing periods

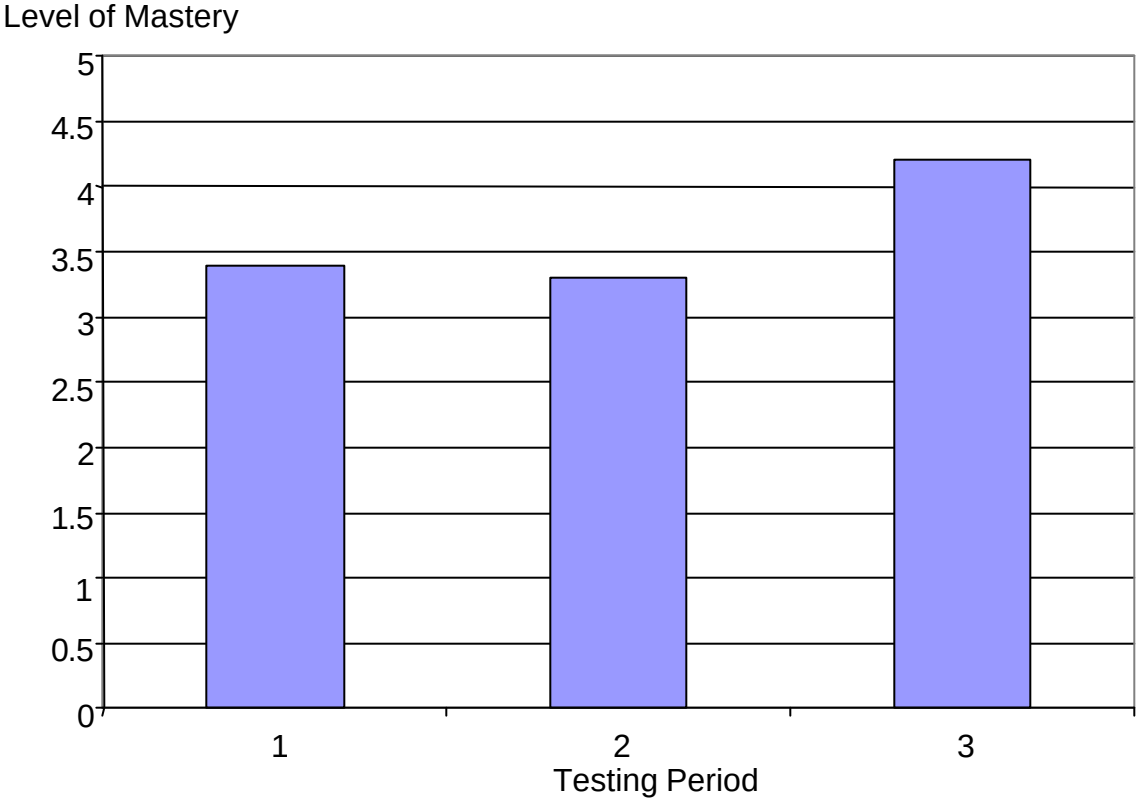
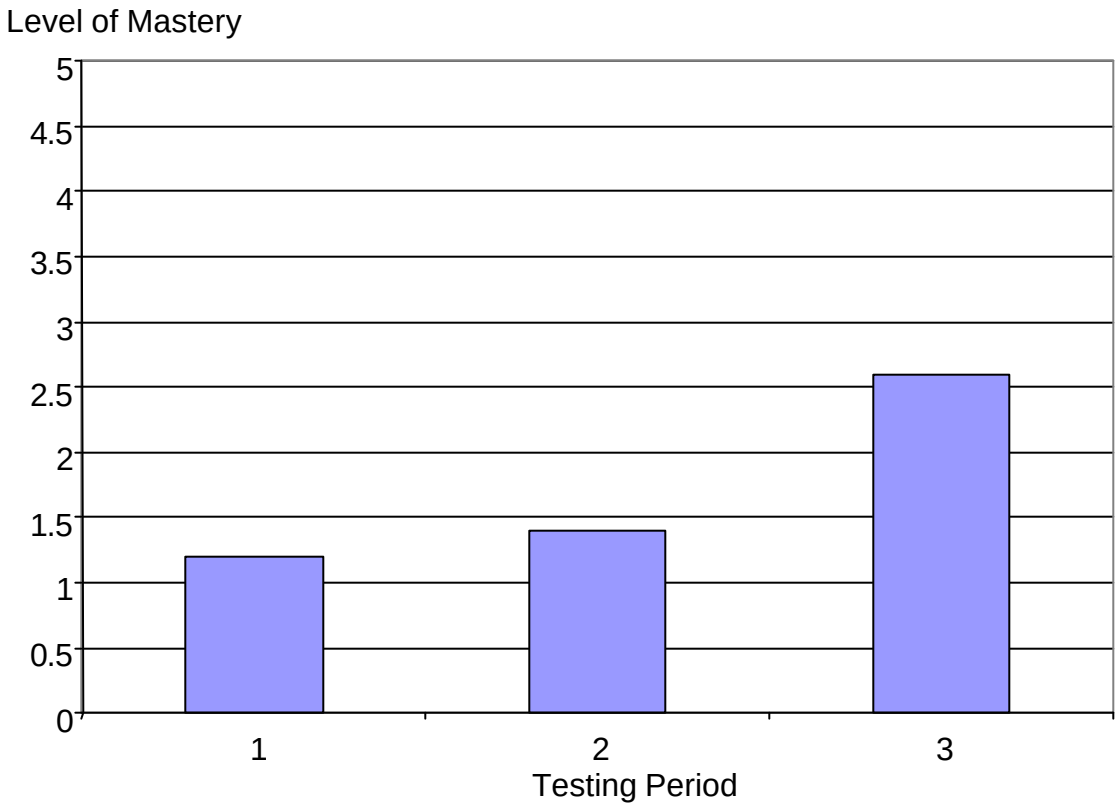


Figure 10. Participant two: writing level of mastery obtained during testing periods



Results of CIU Analysis

Analysis of conversational samples obtained from participant two revealed that he produced 56.22 words per minute and 17.88 CIUs per minute. He obtained a CIU percentage score of 32, well below the aforementioned performance of non-brain damaged individuals (i.e., no less than 125 words per minute, 107 CIUs per minute, and have a CIU percentage score of no less than 76). This analysis demonstrated that his discourse was informative and effective thirty-two percent of the time (see Figure 11, Figure 12).

Figure 11. Participant two: percentage of CIUs obtained during testing periods

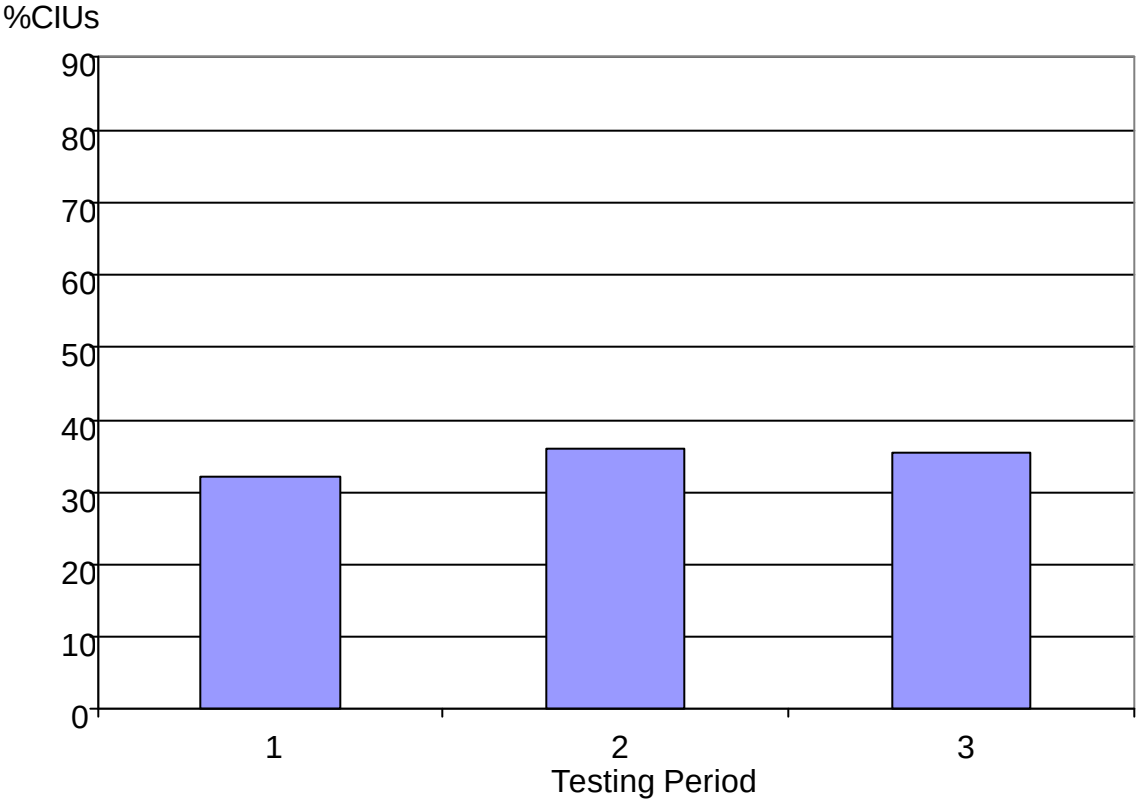
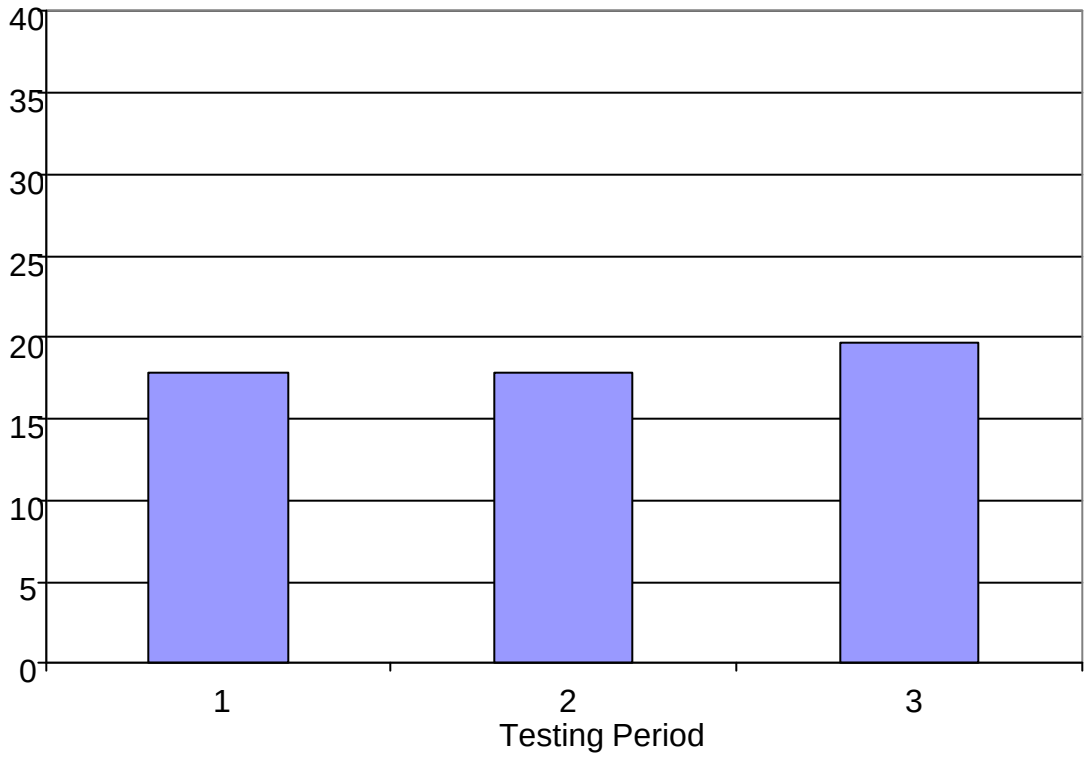


Figure 12. Participant two: CIUs per minute obtained during testing periods



Treatment Period One

During this period, participant two received RET+SE.

Results of CIU Analysis

Participant two produced an average of 331 words and 126 CIUs during the conversation samples obtained in the first treatment period. On average, he produced 50 words per minute and 19.34 CIUs per minute. His average CIU percentage score was 38.4. A general trend of improvement was noted in the CIUs per minute and the CIU percentage score.

Results of the Personal Mastery Communication Scales-Probe

Participant two's perceived level of mastery for verbal expression fell at an average rating of 2.6 for the treatment period. His perceived difficulty average was 2.7, and perceived importance for verbal expression tasks was, on average, 2.7. These results illustrate a low level of perceived mastery and importance and a high level of perceived difficulty for verbal expression tasks during the first treatment period. The results of the probe did not differ from his baseline ratings for verbal expression (i.e., ratings did not differ more than 0.2).

Intermediary Period

Results of the BDAE

Results of the BDAE remained consistent with Broca aphasia for participant two. His rating scale profile also was consistent with baseline measures. Slight decreases in ratings for phrase length and word finding abilities were noted, with a slight increase in the rating for prosody. All other scores on the BDAE rating profile and severity rating remained consistent with baseline measures (see Table 3).

Results of the CADL-2

Results of the CADL-2 revealed a score of 93, indicating a moderate-high level of functional communication. His performance fell in the 94th percentile. This finding revealed an improvement of 7 points from pre-testing to the intermediary period (see Table 4). He was able to obtain information from a building directory and report the accurate time and temperature to the examiner

(i.e., following a telephone call to the aforementioned local company). Ability was high for most daily communication tasks (e.g., routine tasks required at a doctor's office).

Results of the Personal Mastery Communication Scales

Participant two's average ratings for perceived mastery of communication tasks ranged from 1.4 (writing) to 3.8 (verbal expression). Difficulty ratings averaged from 1.2 (writing) to 3.8 (verbal expression). Perceived importance ratings ranged from 1.2 (writing) to 4.1 (verbal expression). Increases in perceived mastery from the pre-testing period were noted in auditory comprehension and verbal expression. Difficulty ratings also increased in verbal expression and auditory comprehension (i.e., a lower level of difficulty was perceived). Increases were also noted for importance in these modalities. All other ratings (i.e., reading and writing) were consistent with previous ratings (see Figure 7, Figure 8, Figure 9, Figure 10).

Results of CIU Analysis

During the intermediary period, participant two, on average, produced 191.5 words and 69 CIUs. He generated 49.03 words per minute and 17.88 CIUs per minute. His average CIU percentage score was 36, which reflected a slight increase in improvement from the pre-testing period. All other scores remained consisted with the results of the pre-testing period (see Figure 11, Figure 12).

Treatment Period Two

During this period, participant two received the traditional version of RET.

Results of CIU Analysis

Participant two, on average, produced 196.2 words and 78.4 CIUs during this period. His average words per minute score was 47.76 with an average CIU per minute score of 18.87. On average, his CIU percentage score was 39.6. Both the CIUs per minute and CIU percentage score slightly decreased from treatment period one.

Results of the Personal Mastery Communication Scales-Probe

Participant two had an average 3.1 on perceived mastery, difficulty, and importance of verbal expression tasks. These results indicate a slight improvement from treatment period one.

Post-Testing

Results of the BDAE

Post-testing results of the BDAE remained consistent with Broca aphasia for participant two. Overall severity level improved to a level two, reflecting ability to hold conversations about familiar subjects when aided by the listener. Phrase length and use of informational words slightly increased from pre-testing and intermediary testing periods. Ability to use simple social responses, write common irregular words, and comprehend oral sentences also revealed a slight improvement. Overall, however, performance was not significantly different from the previous periods. All other scores on the BDAE rating profile and severity

rating remained consistent with baseline and intermediary measures (see Table 3).

Results of the CADL-2

Participant two's performance on the CADL-2 during the post-testing period revealed a score of 93. His performance fell in the 94th percentile, again indicating a moderate-high level of functional communication (see Table 4). While performance continued to show improvement from the pre-testing period, performance was consistent with the results from the intermediary period of testing.

Results of the Personal Mastery Communication Scales

Participant two's perceived level of mastery for communication tasks were high for auditory comprehension (4), verbal expression (4.3), and reading (4.2). Perceived mastery for writing was rated as 2.6, an increase from previous ratings. Ratings of perceived mastery for reading also reflected an increase from the intermediary period. Perceived levels of difficulty for communication tasks ranged from 2.6 (writing) to 4.3 (verbal expression). Average levels of importance ranged from 2.6 (writing) to 4.3 (reading) for participant two. Increases in importance and decreases in difficulty were noted for both reading and writing. All other scores remained consistent from the intermediary period (see Figure 7, Figure 8, Figure 9, Figure 10).

Results of CIU Analysis

Participant two, on average, generated 352 words and 125 CIUs during this period. His average words per minute score was 55, with an average CIUs per minute score of 19.66. His average CIU percentage score was 35.5. A slight decrease from the intermediary period in the CIU percentage score and the CIUs per minute was evident. However, an increase from the pre-testing period to the post-testing period was revealed in this analysis (see Figure 11, Figure 12).

Participant two: Summary of Results

Participant two evidenced a slight improvement in level of severity on the BDAE following the traditional RET treatment (see Table 3). An increase of seven points was noted on the CADL-2 following the RET+SE treatment. CADL-2 scores remained consistent following the traditional RET treatment (see Table 4). Perceived levels of mastery for auditory comprehension and verbal expression increased following RET+SE. Levels of mastery for reading and writing increased following the traditional RET treatment (see Figure 7, Figure 8, Figure 9, Figure 10). An increase was revealed in CIUs per minute and the CIU percentage score following RET+SE. A slight decrease in these measures was noted following the traditional RET treatment (i.e., from the intermediary period to the post-testing period). However, improvement was noted from pre-testing to post-testing for the CIUs per minute and CIU percentage score (see Figure 11, Figure 12).

Chapter Four

Discussion

The purpose of the present study was to examine the effects of self-efficacy in treatment for aphasia. Two types of treatment, traditional Response Elaboration Training and a modified version of Response Elaboration training including the four sources of self-efficacy, were implemented. A single-subject, cross-over design was employed. This design allowed for a baseline period, treatment period, intermediary period, second treatment period, and post-testing period. Two subjects, both with Broca type aphasia, participated and received the two types of treatment at alternating times to control for order effect. It was hypothesized that a high level of perceived self-efficacy would correlate with a positive treatment outcome. It was also hypothesized that a treatment incorporating the four sources of self-efficacy (i.e., mastery experience, vicarious experience, verbal persuasion, and emotional arousal) would promote a higher level of self-efficacy, thereby promoting a more positive therapeutic outcome.

Participant one exhibited a high level of perceived self-efficacy for all communicative modalities (i.e., auditory comprehension, verbal expression, reading, and writing) during the pre-test period. According to Zimmerman (2000), studies have shown that an individual's level of perceived self-efficacy for a given task is an accurate predictor of the individual's performance in that task. In

accordance with this data, participant one's high level of perceived self-efficacy for communicative tasks should have been predictive of a high level of treatment performance (i.e., a positive treatment outcome). Results of the study revealed participant one to have a general trend of improvement in effective communication as measured by the CIU analysis throughout the study. Also, the aphasia severity rating, as measured by performance on the BDAE, improved following the traditional RET period. This improvement suggests that a high-level of perceived self-efficacy may have aided performance. The scores obtained from the CADL-2 throughout testing periods (i.e., indicative of a high level of functional communication abilities) may also suggest a relationship between performance and perceived levels of self-efficacy.

Results of participant two revealed a low level of perceived self-efficacy in all modalities of communication during the pre-testing period. According to Bandura (1986), a low level of perceived self-efficacy may result in anxiety for a specific task and, therefore, result in a low level of performance for that task. Participant two exhibited minimal differences in effective communication ability, as measured through the CIU analysis, throughout this study. This result may suggest that a low to moderate level of perceived self-efficacy may be related to the minimal improvement demonstrated. Following the period of RET including the sources of self-efficacy, however, gains were seen in perceived levels of self-efficacy for auditory comprehension and verbal expression. At this time, improvement was reflected through participant two's score on the CADL-2 (i.e.,

improving to a high level of functional communication ability). This finding also supports the hypothesis that a treatment program including the sources of self-efficacy will promote gains in perceived self-efficacy, thereby increasing performance. Following the second treatment period, in which he received traditional RET, gains were also noted in his perceived levels of self-efficacy for reading and writing. This may suggest that self-efficacy gains in one or two modalities (e.g., auditory comprehension and verbal expression) may generalize to other related modalities (e.g., reading and writing) as treatment progresses.

Also, it has been suggested that changing self-efficacy may result in a change in performance (i.e., an increase in self-efficacy positively correlates with higher performance) (Bandura, Adams, & Beyer, 1977). Although communicative effectiveness did not change for participant two, changes were reflected in his performance on standardized assessments. As aforementioned, an increase in performance was seen on the CADL-2 following the first treatment period (i.e., RET+SE); this improvement maintained to the post-testing period. Also, an improvement in the aphasia severity rating, as determined by performance on the BDAE, was revealed during the post-testing period. This may suggest a relationship between improvements seen in participant two's level of perceived self-efficacy and communication improvement.

The results were consistent with the hypotheses. Participant one's general trend of improvement suggested a relationship between high levels of perceived self-efficacy and communication improvement. While improvements

were noted in the perceived levels of self-efficacy for participant two; levels remained in the moderate range. This low-moderate level of self-efficacy may also suggest a relationship with minimal improvement in effective communication; thereby supporting the hypothesis (i.e., level of self-efficacy will predict treatment performance). Also, increases reflected for participant two in the auditory comprehension and verbal expression perceived level of self-efficacy following the period of RET+SE supported the second hypothesis (i.e., incorporation of the sources of self-efficacy into treatment will result in higher levels of self-efficacy). Improvement in the CADL-2 score following this period may be related to the improved levels of self-efficacy.

Recommendations for Further Research

As proposed by Resnick (2002), an effective way to incorporate vicarious experience into treatment is through the use of partnering. In this manner, one may partner the individual with another similar to him/herself. This would allow support from a peer, as well as provide opportunity for additional vicarious experience. Another method that could be utilized is group therapy programs. Group therapy sessions allow interaction of the individual with others similar to him/herself. Throughout the present study, group sessions and/or the use of partnering were not used. This true-life experience may be more beneficial than the use of videotapes. Therefore, the benefits of group sessions/partnering versus the benefits of obtaining vicarious experience via videotape should be examined in further research.

Resnick (2002) also suggested the use of goal setting and education throughout treatment programs to encourage verbal persuasion. Aiding the individual to set and accomplish realistic goals has been found to strengthen self-efficacy. Once goals are set, progress toward these goals should be reviewed on a regular basis; at this time, the professional should provide encouragement and reinforcement to motivate the individual to complete the goal. Throughout therapy, it is also recommended to employ education. As a speech-language pathologist, one might find it beneficial to continually educate individuals about all aspects of aphasia. This may enable the individual to gain a more thorough understanding of his/her difficulties and potential improvements, thereby promoting motivation and encouragement. This, too, has been found to increase levels of self-efficacy in other realms of treatment (Resnick, 2002). Education and goal setting was not utilized throughout the present study, however. Verbal encouragement and reinforcement was utilized throughout the RET+SE treatment period. Additional research is necessary to determine the self-efficacy benefits of also incorporating goal setting and education into a treatment program for aphasia.

As previously mentioned, self-efficacy has also been shown to affect an individual's motivation, risk for depression, and ability to set and accomplish goals (Resnick, 2002; Phillips & Gully, 1997; Blazer, 2002). All of these factors may play a role in an individual's treatment outcomes. The interaction between self-efficacy and the above factors may be interesting to determine. Further

research is suggested into how increases in self-efficacy influence motivation, depression, and goal setting ability for individuals with aphasia. Also, research could determine whether or not increases in self-efficacy improve motivation, depression, and goal setting. If an interaction is found, it may be interesting to determine how these increases affect overall treatment performance for individuals with aphasia.

Additional research is also suggested regarding the benefits of the incorporation of self-efficacy into a treatment program. While the present study did suggest a correspondence between self-efficacy and performance improvements following an increase in self-efficacy, the study was limited by sample size and the allotted time frame. The study may have been constrained due to gender differences, individual variability of the participants (e.g., different aphasia severity levels), the individuals time post-onset (i.e., eleven years and fifteen years, respectively), and the relatively short time frame of the actual treatment periods (i.e., ten sessions). Also, benefits of a treatment incorporating the sources of self-efficacy were unable to be determined for participant one due to a ceiling effect. High levels of self-efficacy were revealed for participant one during the pre-testing period; these levels remained relatively constant throughout the study. Taking all of these variables into consideration, additional research may further support the manner in which self-efficacy and performance is altered throughout various treatment programs. A larger study would allow analysis of how various factors attribute to performance, and what activities most

efficiently promote higher levels of self-efficacy (e.g., group sessions versus vicarious experience promotion via videotape).

Conclusion

While additional research is recommended to determine the overall benefits of a treatment program including the sources of self-efficacy, the present study did find a general trend in improvement for participant one and an improvement in standardized test scores for the second participant. As self-efficacy levels increased for participant two, functional communication scores also increased. There appeared to be a relationship between communication performance and self-efficacy levels. Participant one, having a high level of perceived self-efficacy, did demonstrate improvement in effective communication (i.e., experienced a positive treatment outcome). Participant two, having low to moderate levels of perceived self-efficacy, made minimal gains in effective communication. Therefore, as aforementioned, focusing on an individual's level of self-efficacy prior to and during treatment for aphasia may allow foresight into his/her treatment potential. A treatment incorporating the sources of self-efficacy may promote gains in levels of self-efficacy, thereby promoting more positive performance toward speech and language goals.

Self-efficacy has been demonstrated by Zimmerman (2000) to be an accurate predictor of performance for a given task. Also, increases in self-efficacy have been demonstrated to promote positive changes in behavior (Bandura, Adams, & Beyer, 1977). Perceived self-efficacy can also affect an

individual's level of motivation, risk for depression, and goal accomplishment abilities (Resnick, 2002; Phillips & Gully, 1997; Blazer, 2002). Therefore, incorporation of the sources of self-efficacy during treatment for aphasia may promote positive treatment outcomes through changes in self-perception, motivation, goal setting/accomplishment abilities, and reduction of depression. In turn, one may find that assessment and incorporation of self-efficacy sources into treatment programs may encourage a more positive outcome for the individual with aphasia.

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Appendix

Examples of Pictures Utilized During RET

1. Norman Rockwell: *Triple Self-Portrait*
2. Norman Rockwell: *Sunset*
3. Norman Rockwell: *Little Girl Looking Down stairs at Christmas Party*
4. Norman Rockwell: *'Oh Boy! It's Pop with a New Plymouth!'*
5. Norman Rockwell: *The Connoisseur*
6. Norman Rockwell: *Freedom from Want*
7. Norman Rockwell: *Choosing Up*
8. Norman Rockwell: *First Down*
9. Norman Rockwell: *The Expert Salesman*
10. Norman Rockwell: *Men of Tomorrow*
11. Norman Rockwell: *The Runaway*
12. Norman Rockwell: *Going and Coming*
13. Norman Rockwell: *Freedom of Speech*
14. Norman Rockwell: *Gone Fishing*
15. Norman Rockwell: *The Prom Dress*