2014

Role of speech-language pathologists in aphasia therapy and rehabilitation as reported by practicing speech-language pathologists

Meredith Wooley
University of Mississippi. Sally McDonnell Barksdale Honors College

ROLES OF SPEECH-LANGUAGE PATHOLOGSITS IN APHASIA THERAPY AND REHABILITATION AS REPORTED BY PRACTICING SPEECH-LANGUAGE PATHOLOGISTS

by
Meredith Wooley

A thesis submitted to the faculty of The University of Mississippi in partial fulfillment of the requirements of the Sally McDonnell Barksdale Honors College.

Oxford
May 2014

Approved by

_____
Advisor: Dr. Robin Edge

_____
Reader: Mr. Bradley Crowe

_____
Reader: Dr. Carolyn Higdon

ACKNOWLEDGEMENTS

I offer my sincere appreciation and gratitude to my thesis advisor, Dr. Robin Edge for all the time she has dedicated to me, and the effort she has put into this project. Without her instruction, this thesis would not have been possible. She has challenged me through this process and I am grateful for the knowledge that I have gained through it all. I am also thankful for the love and support of my family and friends who continually encouraged me and pushed me to the finish.

ABSTRACT

MEREDITH WOOLEY: Roles of Speech-Language Pathologists in Aphasia Therapy and Rehabilitation as Reported by Practicing Speech-Language Pathologists (Under the direction of Dr. Robin Edge)

This thesis examined the roles of speech-language pathologists (SLPs) within aphasia therapy and rehabilitation. Research compiled in the literature review explained the disorder of aphasia, and the roles of SLPs when working with people who have aphaisa, as outlined in the ASHA policy document *Roles of Speech-Language Pathologists in The Identification, Diagnosis, and Treatment of Individuals with Cognitive-Communication Disorders: Position Statement* (2005b). This study investigated ASHA-certified, masters-level SLPs' preparedness to work with aphasia patients, as well as their familiarity of their roles and resonsibilities in aphasia therapy and rehabilitation, and their awareness of the possible forms of treatment for aphasia. An electronic survey was developed to investigate these three research questions and was emailed to 519 SLPs across the United States. One-hundred five (105) surveys were completed. The survey responses indicated that SLPs felt prepared to participate in aphasia rehabilitation upon receiving their CCC-SLP, and were also familiar with a majority of the roles and responsibilities of SLPs in aphasia rehabilitation. A majority of the SLPs surveyed were not aware of the broad range of treatment programs available for patients with aphasia. Further research is needed to investigate the possible correlation between graduate-level education in aphasia and participants' familiarity with the topic of aphasia.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Aphasia is a cognitive-communication disorder related to damage involving the left hemisphere of the brain. A cognitive-communication disorder can impair both communication and cognition. Communication can be either verbal or nonverbal, and includes listening, speaking, gesturing, reading, and writing (ASHA, 2005b). Cognition involves processes like attention, perception, memory, and organization. Cognition and communication are so closely related that impairment in language and communication can impair cognitive processes, just as cognitive impairments may disrupt communication (ASHA, 2005a). A person with aphasia may not be able to understand, produce, or use language and may also have difficulty with tasks such as telling time, doing math problems, or perceiving the meaning of symbols such as traffic signals (LaPointe, 2005).

A cognitive-communication disorder can be either congenital (present from birth) or acquired (ASHA, 2005b). LaPointe (2005) states that aphasia is distinctly an acquired disorder that can be caused by a cerebrovascular accident (CVA), traumatic brain injury (TBI), or a brain tumor. CVA, also known as a stroke, is the leading cause of aphasia, and occurs when the blood supply to the brain is disrupted, causing damage or death of the brain cells and neurons due to the lack of nourishment that they are receiving (LaPointe, 2005). Another possible etiology of aphasia is neurodegenerative diseases such as Alzheimer's, or Parkinson's. These diseases often result in brain damage that impairs specific language functions such as memory, reasoning, and judgment. Although these

diseases impair cognitive-communication abilities, there is controversy over whether aphasia occurs as a result (LaPointe, 2005).

Aphasia can be identified as a syndrome due to the array of possible speech and language symptoms (Drummond, 2006). Symptoms include loss in one or more of the four language modalities, (auditory comprehension, reading comprehension, verbal expression, and written language). Auditory comprehension impairments consist of difficulties understanding speech, providing inaccurate answers to "yes/no" questions, inability to understand complex grammar, and not being aware of their errors (ASHA, 2014). Reading comprehension impairments, or alexia, include trouble comprehending written information, difficulty identifying words by sight, replacing associated words for the word itself, and difficulty reading function words such as *to*, *from*, or *the*. Loss in verbal expression includes difficulty finding words (anomia), speaking in single words, putting words in the wrong order, and speaking in short, fragmented phrases (ASHA, 2014). Impairments in written language are often seen when patients with aphasia experience difficulty writing single words, writing run-on sentences, and writing sentences with incorrect grammar, or copying letters, words, and sentences (ASHA 2014). These symptoms are seen in unique patterns and combinations and can vary greatly from one patient to another. Patient's may present with one or all of these symptoms depending on the location and severity of brain damage.

Aphasia symptoms are not limited to the patient's speech and language, but also manifest in areas that affect the patient's quality of life. Those with aphasia are often disconnected from their social circles and personal relationships because these relationships are dependent on the ability to communicate (Sarno, 1993). Aphasia often

changes an individual's identity and alters the patient's sense of themselves. Not surprisingly, depression is the most frequently researched and reported psychological symptom of aphasia (Sarno, 1993; 2004). Because of this, rehabilitation for aphasia calls for a psychosocial intervention model that should also address identity issues including personality, emotions, human nature, and other affected personal attributes.

Although aphasia can be generally defined and described by its symptoms, there has been much controversy surrounding the definition of this disorder for years. The term aphasia was first introduced in 1864, and has since evolved and been the subject of much debate (Drummond, 2006). Hillis (2007) states that even within the past 25 years, the classification of aphasia has shifted from primarily describing impaired language skills to describing the impaired cognitive functions. Historically, the field of medicine has been the leading discipline in aphasia research. In more recent years, however, there has been an increase in the interest of aphasia by many fields such as neuropsychology, neurolinguistics, and speech-language pathology (Tesak & Code, 2008). Aphasia rehabilitation modeled its foundation and functional perspective after the field of rehabilitation in medicine (Sarno, 2004). The philosophy used in the medical rehabilitation setting can be applied to assessment, treatment, and many other areas of aphasia rehabilitation such as collaboration and advocacy.

With an increased interest in aphasia and other cognitive-communication disorders, speech-language pathologists (SLPs) have become more involved in stroke and aphasia rehabilitation. This has presented a need for their roles to be more clearly defined. In the 1950s aphasia rehabilitation services were practically non-existent, and there were only 1600 SLPs who were members of American Speech-Language-Hearing

Association (ASHA) (Sarno, 2004). Currently, there are over 175,000 members of ASHA, many of who are equipped to provide services to patients with aphasia. In 1989, The Joint Committee on Interprofessional Relations Between ASHA and Division 40 (Clinical Neuropsychology) of the American Psychological Association (APA) was formed to encourage and promote collaboration between Neuropsychologists (NPs) and SLPs and to help define their roles. Even though roles of professionals often overlap when treating a patient with an acquired brain injury, the SLPs primary role on the interdisciplinary team is to assess and treat speech and language difficulties including attention, memory, and problem solving (Sander et al., 2009).

SLPs work closely with a team of professionals from other disciplines when providing rehabilitation services to clients with cognitive-communication disorders, such as aphasia (Drummond, 2006). For example, stroke patients at the Kessler Institute for Rehabilitation receive simultaneous treatment from a team of professionals including the case manager, nurse, physical therapist, occupational therapist, speech-language pathologist, recreational therapist, pharmacist, dietician, nutritionist, respiratory therapist, and psychologist (Donnelly & King, 2014). Several studies have shown that the interdisciplinary approach improved patient outcomes and quality of care (Strasser et al., 2008). Interdisciplinary team treatment is also widely endorsed within the medical field. For example, Medicare requires an interdisciplinary team approach for inpatient rehabilitation reimbursement. The team approach allows diverse health professionals to coordinate their services to best fit the patient and help them to recover (Strasser et al., 2008).

Although therapy given by an interdisciplinary team has been shown to improve patient outcomes, there are concerns among SLPs regarding their role on this team, as well as the roles of other professionals. As the collaborative model has been used more often, SLPs have highlighted issues of overlapping professional boundaries and scopes of practice (Coordinating Committee, 2009). Studies have investigated the perceptions of occupational therapists (OTs), physical therapists (PTs), NPs and SLPs addressing one another's roles and the obstacles of working in a team setting (Insalaco, Ozkurt, & Santiago 2007; Sander, Raymer, Wertheimer, & Paul 2009). Although there are studies about the roles of SLPs on a team, this research is general. There has been little research specifically pertaining to the SLPs role in aphasia rehabilitation and how SLPs are to provide services to these patients. SLPs must be able to understand their specific roles in order to collaborate well with other professionals and to provide proper services to patients.

The topic of this thesis is to investigate the roles and responsibilities of SLPs in aphasia rehabilitation, and how involved SLPs are in the recovery process of patients who have aphasia. The research will investigate the percentage of SLPs who feel prepared to work with patients who have aphasia. A portion of the study will compare SLPs' preparedness when working among patients from different age groups, and with different types of aphasia. The study will also research the roles and responsibilities of SLPs in aphasia rehabilitation, and question how familiar SLPs are with these responsibilities. The research will also explore what role SLPs indicate to be the most important role when working with patients who have aphasia. A final purpose of this research is to

investigate the various rehabilitation options for individuals with aphasia and to determine how aware SLPs are of these options.

CHAPTER II

LITERATURE REVIEW

Aphasia is a broad term in which researchers and professionals often disagree on an exact definition. The definition of aphasia in the past has included the presence of receptive and expressive language disorders, and has also been described as a disturbance in the ability to understand visual or auditory communicative symbols, or to produce words, phrases, and sentences through speech and writing (Drummond, 2006). It is generally accepted, however, that aphasia is a term referring to the acquired language impairments that someone may experience after the occurrence of brain damage (Code & Petheram, 2011). Although this definition describes aphasia accurately, many who study aphasia would argue that this definition is too general to serve its purpose (McNeil & Pratt, 2001). There are many other disorders that can be described as acquired language disorders caused by brain damage that are not identified as aphasia. An extensive definition of aphasia includes many aspects. Aphasia is an acquired language disorder implying that the individual had normal language and communication skills prior to brain damage (Drummond 2006). The disorder is a consequence of brain damage to the language processing parts of the brain. The symptoms of aphasia are not the same in every case; they occur in unique patterns and clusters, and aphasia may affect one or more of the four language modalities (Drummond, 2006).

Impairments in the language modalities and the symptoms of aphasia depend on the location and degree of brain damage. This includes problems comprehending spoken language, expressing language, or both. While some patients may have difficulties producing speech, others might be able to produce speech, but it may be difficult for a

listener to understand them (ASHA, 2014). Brain damage resulting in aphasia can be caused by brain tumors, closed-head injuries, infection, or trauma, but is most commonly caused by strokes. Language is often not the only area affected in these patients. Patients with aphasia can also experience physical impairments; this may include paralysis or weakening of the upper or lower extremities (ASHA,2014). Losing the ability to effectively and naturally communicate, along with mobility, can be unsettling to patients and their caregivers. Aphasia changes their lives in social, professional, and educational areas. Because of the setbacks caused by aphasia, those recovering may find themselves feeling frustrated and isolated (Elbaum & Benson, 2007). Aphasia may inhibit the ability to express or understand language, and may sometimes occur along with other related speech disorders such as dysarthria or apraxia, which are defined as motor speech disorders (ASHA, 2011).

Aphasia can be a debilitating disorder, and it affects many people in the United States. According to the National Aphasia Association (NAA, 2011), aphasia is more common than Parkinson's, cerebral palsy, or muscular dystrophy. It is projected that the prevalence of aphasia today is about 1 million people in the United States (NINDS, 2014). It is also estimated that more than 100,000 people in America acquire this disorder annually, however, it is difficult to verify this estimate without debate (NAA, 2011). The prevalence and incidence of aphasia can vary greatly depending on how it is defined (Code & Petheram, 2011). These figures are often based on the annual occurrence and total number of strokes, yet if the statistics include other instances of brain damage, that has caused aphasia, the prevalence and incidence will undoubtedly increase (Code & Petheram, 2011). Although there has been difficulty confirming the exact number of

those with aphasia, it is likely that the prevalence of this disorder is escalating along with the survival rate of stroke (Code & Petheram, 2011).

Types of Aphasia

Type of aphasia is classified based on the location and severity of the brain injury, and result in two main categories: fluent and nonfluent. Fluent aphasia is characterized by speech that is produced with a normal speaking rate and without hesitations, but does not convey meaning (Edwards, 2005). Nonfluent aphasia is characterized by speech that has a slow rate, reduced phrase length, dysprosody (abnormal rhythm of speech), and in which speakers have increased effort when communicating (Kearns, 2005). Those with nonfluent aphasia are often able to communicate with meaningful words, although they have difficulty forming fluent and complete sentences. On the other hand, fluent aphasic speakers may have melodic and uninterrupted sentences, but their speech will be devoid of any meaning (Kearns, 2005). Examples of fluent types of aphasia include Wernicke's, conduction, anomic, subcortical and transcortical sensory aphasia. Examples of nonfluent types of aphasia include Broca's, transcortical motor, mixed transcortical, and global aphasia. Two other types of aphasia crossed, and primary progressive aphasia are not classified as either fluent or nonfluent (ASHA, 2007a). A person's symptoms may not always be categorized into one specific aphasia type. Symptoms vary depending on the patient, and symptoms will also change with recovery, shifting the classification of aphasia type (ASHA, 2014). A detailed description of each of the above types of aphasia follows.

Fluent Aphasia Types

Wernicke's Aphasia. Wernicke's aphasia is a fluent type of aphasia and is normally caused by damage occurring to the posterior left hemisphere of the brain. A person with Wernicke's aphasia often produces nonsensical sentences that, although retain sentence structure, lack meaning (ASHA, 2007a). A person living with Wernicke's aphasia may completely lose the ability to comprehend spoken language. The deficits range from a complete inability to understand and process language, to a less-noticeable comprehension disorder in which some input is processed properly, and some of it is not (Caspari, 2005). Another characteristic of Wernicke's aphasia is fluent but paraphasic speech. Paraphasic speech consists of the speaker adding in extra syllables or words as they speak; this sometimes includes neologisms, which are made up words (Caspari, 2005). Patients may also present with difficulties in reading comprehension. They may have trouble recognizing letters by name, or matching letters. Writing is also affected by this disorder. The writing of people with aphasia is similar to their spoken language, in that they are able to write easily and fluidly, but there is no meaning to what they write. Those with Wernicke's aphasia are also unaware that they are making errors in their expressive language (Caspari, 2005).

Conduction Aphasia. Conduction aphasia is another type of fluent aphasia that primarily impairs a person's ability to repeat phrases. This type of aphasia is most often associated with lesions in the supramarginal gyrus, but can also be caused by lesions along the border of the Sylvian fissure (Goodglass, 1993). Conduction aphasia does not greatly affect patients' comprehension or expression. These patients may be able to express themselves and comprehend information at a functional level, but will struggle with repetition, especially as sentences become longer and more complex (ASHA,

2007a). An individual with conduction aphasia will speak with proper intonation and will be able to understand what other people say, although they have difficulties finding words. Because this is a fluent type of aphasia, individuals with this disorder are able to produce fluent output, however it is not as fluent as Wernicke's aphasia (Simmons-Mackie, 2005). Sometimes the individual's mostly fluent speech will be interrupted by self-corrections and hesitations. Another symptom of conduction aphasia is the phonemic paraphasias, phonological errors, which occur. When speaking, these patients might choose the wrong phonemes for words they are trying to say. People with this type of aphasia are able to frequently recognize their speech errors, but are incapable of correcting these errors (Simmons-Mackie, 2005).

Anomic Aphasia. Anomic Aphasia is a very mild form of fluent aphasia. Those suffering from anomic aphasia have difficulties in word finding and word recognition (ASHA, 2007a). When having trouble finding words, they instead use nonspecific filler words such as "thing", or use circumlocution where the individual describes the specific word they are attempting to say (ASHA, 2007a). When they have retrieved the correct word, they may not always recognize that they have done so. Although naming is impaired in these patients, fluency, comprehension, and repetition remain relatively unimpaired. Reading and writing are only mildly affected, or not affected at all (Kearns, 2005). This type of aphasia has been related to damage within the posterior language areas (Kearns, 2005). Anomic aphasia is the mildest form of aphasia and it is believed that this disorder is the endpoint of many individuals who have recovered from aphasia (Kearns, 2005).

Subcortical Aphasia. Subcortical aphasia is characterized by the subcortical location of brain damage that has resulted in aphasia. Subcortical lesions mostly occur in the thalamus and basal ganglia; these subcortical areas of the brain function to send and receive input and regulate both sensory and motor abilities (Herero, Barcia, Navarro, 2002). Although the thought that aphasia can be caused by subcortical lesions is not new, subcortical aphasia is a fairly recent distinction. With the ability to use computed tomography and magnetic resonance imaging in clinical practice, it has been easier to study the language impairments and the related damage to subcortical regions of the brain (Herrerro et al., 2002). Identifying aphasia caused solely by subcortical lesions is rare, and in some cases patients identified with subcortical lesions may have no signs of subcortical aphasia.

There have been three types of subcortical syndromes identified: striato-capsular aphasia, thalamic aphasia, and aphasia associated with white matter disease (Rosa, Canini, Borsa, Marien, Cappa, & Abutalebi, 2014). However, these subcategories are not easy to identify because they have no specific symptom clusters to differentiate between the syndromes (Herrerro et al., 2002). In general, subcortical aphasia preserves repetition, but results in hypophonia, a reduction in voice volume. Speech is fluent but limited and the patient's writing and word finding abilities are impaired. Oral and written comprehension remains intact, and individuals are still able to read aloud (Rosa et al., 2014).

Transcortical Sensory. Transcortical sensory aphasia is classified as fluent; although patients may have impaired auditory comprehension, their repetition skills have stayed intact (Spreen & Risser, 2003). Patients may frequently use filler words and

circumlocutions. Most studies on transcortical mixed aphasia describe the disorder as having fluent but irrelevant spontaneous speech due to verbal paraphasias (Berthier, 1999). Other impairments include naming, which lead to word finding pauses in conversation. The patient's ability to accurately repeat words and phrases does not compensate for the comprehension deficits of transcortical aphasia. Often individuals with this disorder will repeat questions instead of answering them (ASHA, 2007a). In transcortical sensory aphasia, brain damage involves the deep posterior parietal or occipito-temporal region (Drummond, 2006).

Nonfluent Aphasia Types

Broca's Aphasia. Broca's aphasia is nonfluent and manifests with difficulties in producing sentences (ASHA, 2007a). Although the vocabulary of nouns and verbs may still be in tact, Broca's aphasia causes problems with understanding grammar. Due to syntax deficits, comprehension is mild to moderately impaired. This type of aphasia is caused by damage in the anterior portion of the left hemisphere of the brain (ASHA, 2007a). People suffering with Broca's aphasia are typically able to use content words like nouns, verbs, and adverbs in their speech, but leave out grammatical morphemes and function words such as articles, conjunctions, pronouns, auxiliary verbs, and prepositions (Kearns, 2005). Auditory comprehension and reading comprehension is impaired, but to a degree that is still functional for everyday interactions. Writing is also impaired, and errors seen in writing may parallel errors seen in speech (Kearns, 2005).

Transcortical Motor. Transcortical motor aphasia is a nonfluent type of aphasia similar to Broca's. As with transcortical sensory aphasia, answering spontaneous questions is difficult for these patients, but their repetition abilities are still in tact

(2007a). The main difference between sensory and motor transcortical aphasia is that auditory comprehension skills are relatively unimpaired in transcortical motor. Verbal and written output, outside of repetition, shows reduced quantity, variety, and elaboration of speech (ASHA, 2007a). People with transcortical motor aphasia also lack the motor precision needed to properly execute verbalizations (Hollingsworth, Rothi, & Cimino-Knight, 2005). The lesion in transcortical motor aphasia occurs in the white matter that is medial to Broca's area, and is often associated with the anterior cerebral artery distribution areas (Drummond, 2006).

Mixed Transcortical. Mixed transcortical aphasia is a combination of both motor and sensory transcortical aphasia. Severe impairments are present in reception and expression, but people with this type of aphasia will have strong repetition skills (ASHA, 2007a). Mixed transcortical aphasia has been characterized by deficient auditory comprehension, reduced amount of verbal expression (Hollingsworth et al., 2005). Patients with mixed transcortical aphasia are typically unable to spontaneously produce speech, and are often incapable of naming objects (Hollingsworth et al., 2005). Mixed transcortical aphasia results from multiple lesions in the brain, however the perisylvian speech areas are spared (Cauquil-Michon, Flamand-Roze, & Denier, 2011)

Global Aphasia. Global aphasia is another type of nonfluent aphasia that damages both expressive and receptive communication. This is usually due to a large left hemisphere lesion (ASHA, 2007a). Because this type of aphasia is so severe, there is no distinctive pattern of preserved language components in comparison to impaired language components (Goodglass & Kaplan, 1983). People with global aphasia may appear to have fairly good auditory comprehension when answering yes or no questions about family

members, current medical problems, or other topics that have personal relevance. It has also been found that global aphasia patients have a surprising ability to locate geographic places and understand place names (Goodglass & Kaplan, 1983). However, people with this type of aphasia have severe deficits across all aspects of language and none of the communicative modalities are preserved (Collins 2005). Other symptoms experienced by people with global aphasia include difficulties with non-verbal problem solving and oral-verbal, gestural apraxia (Collins, 2005). The deficits experienced by those with global aphasia are not easily affected by traditional rehabilitative treatment.

Unclassified Aphasia Types

Crossed Aphasia. Crossed aphasia is a disorder characterized by the unexpected presence of aphasia following a lesion in the right hemisphere of the brain in an individual who is right-handed. It is generally understood that the left hemisphere of the brain is responsible for speech and language and that the right hemisphere is in control of visual-spatial skills, awareness of body and orientation in time and space (Hartman & Goodsett, 2003). Aphasia is normally related to lesions occurring in the left hemisphere, and not the right hemisphere, as in crossed aphasia, because the speech and language centers of the brain are usually located in the left hemisphere (Hartman & Goodsett, 2003). Crossed aphasia and uncrossed aphasia, any aphasia resulting from left-hemisphere lesions, are similar with the difference being the location of the lesion (Coppens & Hungerford, 1998). Research has found when comparing crossed and uncrossed aphasia, there is a similar distribution of the frequency of aphasia types. Every major syndrome of aphasia has occurred as a result of crossed aphasia (Coppens & Hungerford, 1998).

Primary Progressive Aphasia. Primary progressive aphasia (PPA) is characterized by the gradual decline of language function with unaffected cognitive abilities for a period of time. The condition must persist for at least two years in order to acquire a diagnosis of PPA. This type of aphasia is classified as a focal dementia that causes a gradual loss of language (ASHA, 2007a). Memory, visual processing, and personality are preserved until the progressive stages of the syndrome that occur as the disorder persists. Symptoms of PPA begin with problems in word finding, and progress to deficits in grammar and comprehension. PPA can be described as an unusual form of dementia; memory functions remain undisturbed even as language gradually deteriorates (Mesulam, 2003). PPA usually develops onset around middle age. It has been found that some patients decline rapidly, yet others with PPA had not developed severe aphasia symptoms for six or seven years after being diagnosed (King, Alarcon, & Rogers 2000). The cause of PPA is unknown and it is unclear if PPA is distinct from dementia, or if it is simply a form of dementia presented with atypical symptoms (King, Alarcon, Rogers, 2007).

Treatment

Treatment varies among people with aphasia depending on their specific language deficits. Treatment programs may be developed based on the type of aphasia that the individual is diagnosed with, or treatment may be centered on the primary signs and symptoms exhibited by the patient. Aphasia is complex in nature, thus treatments are always individualized. ASHA (2014) lists general aphasia treatment options, which fall under two main categories: language impairment-based treatment and activities/participation based treatment.

Language Impairment-Based Treatment

Language impairment-based treatment, or impairment-based therapies are developed to directly change or adjust features of the language impairment. This approach attempts to restore language and modify the impairments themselves (Byng, Pound, & Parr 2000). Some main types of impairment-based therapies include: computer-based treatment, Constraint Induced Language Therapy (CILT), Melodic Intonation Therapy (MIT), reading treatment, syntax treatment, treatment of underlying forms, verb network strengthening treatment, word finding treatment, and writing treatment (ASHA, 2014). These treatments focus on the errors made by the patients and can be applied to spoken, written, and gestural modalities of language.

Computer-Based Treatment. Computer-based therapy can be beneficial in treating attention, concentration, visual localization, visual scanning, visual tracking, reaction time, memory, hand-eye coordination, and specific cognitive tasks (Adamovich, 2005). Using computers allows for a highly controlled setting based on what the patient specifically needs. In this type of therapy the patients are competing against themselves. This gives patients control over their own therapy and motivates them, increasing their confidence by allowing them to see their own progress (Adamovich, 2005). Researchers recommend that clinicians consider many things before determining what computer program to use; this includes easy to follow instructions, control of variables or parameters, method of keeping and reporting data, and accurate and age appropriate content (Wilson & Moffat, 1984). Computers are also helpful when it comes to treating reading deficits. They help to train attention, sentence comprehension, paragraph

comprehension, build vocabulary, and rapid scanning or perception exercises (Webb, 2005).

Constraint-Induced Language Therapy. Constraint induced language therapy (CILT) is an intensive treatment that stresses the recovery of spoken language production (Pulvermuller & Berthier, 2008). In this form of therapy, there is a visual barrier between two communication partners, which constrains communication to verbal productions only. This eliminates the use of compensatory nonverbal communication strategies, such as drawing or gesturing, which improves verbal responses over time (Raymer, 2009). The clinician who is facilitating the therapy helps to assists the message sender, supporting the patients' attempts at verbal output, and sometimes whispering the message so that the client may repeat it to the communication partner (Holland, 2008). CILT is provided to patients on an intensive schedule, up to three hours per day for five days per week (Raymer, 2009).

Melodic Intonation Therapy. Melodic intonation therapy (MIT) is a treatment method that takes advantage of the musical abilities of the right hemisphere of the brain. This type of therapy is best known for the rehabilitation of nonfluent aphasics who demonstrate deficits in verbal output (Basso, 2003). At the first stage of therapy, the therapist will sing a word or phrase and then the patient will first hum the melody pattern. After the word or phrase is successfully hummed, the therapist and the patient will sing the melody in unison, and once the patient can successfully sing in unison, the patient will sing the phrase independently. Finally, in the fourth stage of therapy, the patient should be able to speak successfully with normal prosody (Basso, 2003). These four levels of MIT are intended to expand the patients' ability to generate words and phrases

independently. The clinician provides specific programmed prompts to the patient if needed; these cues range from intoning a melodic line and hand tapping to having the patient answer questions using phrases and sentences with intonation (Basso, 2003). Effectiveness of MIT has been seen in clients with left hemisphere lesions involving the Broca's area, nonfluent or limited verbal production, moderately preserved auditory comprehension, and poor repetition (Basso, Manes, Gleichgerrcht, & Macis, 2011). MIT is based on the idea that the unimpaired right hemisphere of the brain can be utilized to help facilitate verbal output (Kearns, 2005).

Reading Treatment. Reading treatment is designed to improve the ability to decode and comprehend written language (ASHA, 2014). Two examples of reading treatments include Multiple Oral Reading (MOR) and Oral Reading for Language in Aphasia (ORLA). These two therapy programs are similar in that they both rely on the repetition of assisted oral readings of sentences and paragraphs to improve fluency (Kim & Russo, 2010). The MOR and ORLA are both based on the belief that repetition of oral reading will initiate quick and automatic comprehension of written text. The MOR treatment focuses on the reading of connected texts, generally comprised of multiple paragraphs. On the other hand, the ORLA uses sentence-level and paragraph-level materials to improve receptive language skills (Kim & Russo, 2010).

Syntax Treatment. Syntax treatment focuses primarily on improving grammatical deficits in spoken utterances (ASHA, 2014). Aphasia can often damage a person's ability to understand and produce grammatically correct sentences. For example, a patient with syntactic deficits may not be able to understand a sentence such as "The cat that the dog is biting is black." In these types of sentences that are semantically reversed,

the person with aphasia may not be able to establish who did what to whom (Berndt, Mitchum, & Haendiges, 1996). The comprehension and production of sentences involves several different factors of cognitive processes, such as word order transformation, or the working memory systems (Zimmerer, Cowell, & Varley, 2014). Syntactic deficits in aphasia may be a result of the breakdown of one of these elements. Because of the many possible components that contribute to syntactic deficits, there is no single treatment to remediate these abilities. The clinician must recognize what syntactic abilities the patient has lost and individually treat the impairment. (Chatterjee & Maher, 2000).

Treatment of Underlying Forms. The Treatment of Underlying Forms (TUF) is a treatment method that builds on complicated sentence forms. This tactic, based on linguistic theory, is intended to develop sentence production in patients with agrammatism (ASHA, 2014). Agrammatism is a form of aphasia that causes patient's to be dysfluent, and to speak telegraphically in simplified phrases(Chatterjee & Maher, 2000). Instead of saying "The cat is playing," people with agrammatism will simplify the phrase to "Cat play." TUF treats the fundamental characteristics of language. It is focused on training complex sentence structures that will generalize to other language structures that are not trained. One example of the treatment is the training and generalization of wh-questions (Thompson & Shapiro, 2005).

Verb Network Strengthening Treatment. Verb Network Strengthening Treatment (VNeST) is focused on improving the ability to understand and produce meaningful speech. This treatment has a goal of increasing retrieval content words when producing sentences (Edmonds, Nadeau, & Kiran, 2009). VNeST trains both the retrieval of verbs and their roles. For example, if the patient is using the verb "measure," they

must be able to understand that "measure" is something that a chef might do to sugar. This helps the individual with aphasia understand the relationship between the action word, the doer of the action (chef), and the receiver of the action (sugar), and generalize this knowledge when forming sentences (Edmonds et al., 2009). There are two different approaches included within VNeST: Chaining (forward and reverse), and sentence production program for aphasia (ASHA, 2014). Chaining is a method that divides tasks, sentences, and words into smaller sections and teaches either the beginning or the end of the item before focusing on the entire task, word, or sentence. For example, when teaching a patient to learn the phrase football player, the task will be broken up into foot, ball, and player before the patient attempts to learn the whole phrase. The second approach within VNeST, sentence production program for aphasia, concentrates on facilitating the production of certain sentence types depending on the needs of the client (ASHA, 2014). For example, if patients have difficulty with naming actions, the program will begin at the word level training the retrieval of verbs (Links, Hurkmans, & Bastiaanse, 2010).

Word Finding Treatment. Word finding treatments aim to improve word retrieval skills during natural contexts of speech and conversation. There are different types of word finding treatments, including word retrieval cueing strategies, gestural facilitation of naming, response elaboration training, and semantic feature analysis treatment (ASHA, 2014). When using word retrieval cueing strategies, the clinician gives the client helpful information such as the initial sound of a word, or contextual hints to prompt the finding of words. Gestural facilitation naming is a way that word retrieval can be facilitated, by pairing a limb gesture with a stimulus, when trying to find a word

(Pashek, 1997). Response elaboration training is an approach in which the SLP helps the person with aphasia to better their conversation skills. The clinician does this by expanding the client's simple utterances; this elaboration is meant to improve word retrieval and the use of content words in conversation (Pashek, 1997). Semantic feature analysis treatment is a treatment approach that requires the client to recall the semantic features (features that describe meaning) of the target word. This is thought to possibly to trigger the semantic network of the brain and help retrieve words that are related to the target word (ASHA, 2014).

Writing Treatment. Writing treatment is a program aimed at improving expressive language skills through the use of written language (ASHA, 2014). One example of this treatment is Copy and Recall Treatment (CART). CART involves the copying of target words repeatedly when presented with a stimulus, often pictures, and is followed by recall tests of written picture naming (Beeson, Hirsch, & Rewega 2002). More recently, SLPs have researched the use of text messaging as a form of writing treatment. A texting version of CART has been created due to the availability and efficiency of using a cell phone. Research has shown that treatment using copy and recall can be effective in training single-word spelling when using the texting function on a cell phone (Beeson, Higginson, & Rising, 2013).

Activities/Participation Based Treatment

Intervention that targets activities and participation has been shown to greatly improve the quality of life of many individuals who have aphasia. Studies have found a higher correlation between the level of participation in daily activities and quality of life in patients with aphasia, than between the performance of daily activities of the severity

of language deficits (Eadie et al., 2006). Treatments that are focused on activity and participation can include multimodal treatment, partner approaches, pragmatic treatment, reciprocal scaffolding, and script training (ASHA, 2014).

Multimodal Treatment. Multimodal treatment focuses on using alternative forms of communication in an effective and efficient way. As indicated by ASHA (2014) multimodal treatment can include Augmentative and Alternative Communication (AAC), visual action therapy, Promoting Aphasics' Communication Effectiveness (PACE), and Oral Reading for Language in Aphasia (ORLA). AAC involves the use of communication aids that assist persons with aphasia in expressing themselves. These augmentative aids can be electronic devices, or other communication boards that use pictures and symbols. Visual action therapy is often used with patients who have global aphasia, who have experienced damage to both receptive and expressive language (Helm-Estabrooks, Fitzpatrick, & Barresi, 1982).. This treatment approach teaches individuals with aphasia to indicate specific items with hand gestures. All directions, reinforcements, and procedural steps are produced nonverbally, guiding patients to utilize symbolic gestures to represent objects (Helm-Estabrooks et al., 1982). When using PACE treatment, the SLP and the individual with aphasia take turns as being the message sender or receiver in a conversation using any mode of communication. This requires that the person with aphasia actively participate and this participation improves their language skills at the conversation level. ORLA treatment was developed to improve reading comprehension in those with aphasia, but improvements have also been seen in oral expression, auditory comprehension and written expression (Cherney, 2010). With ORLA, the patient must repetitively read sentences and paragraphs out loud repeating the

sentences first in unison with the clinician, and then repeating the sentences independently (Cherney, 2010).

Partner Approaches. Partner approaches rely on communication partners to engage with people who have aphasia and facilitate the restoration of communication skills. Partner approaches include conversational coaching, Supported Communication Intervention (SCI), and social and life participation effectiveness (ASHA, 2014). Conversational coaching involves both the person with aphasia, and their conversation partner, such as a family member or significant other. The SLP acts as a coach to both communication partners as they practice different communication scenarios, teaching them to use both verbal and nonverbal strategies in communication (ASHA, 2014). For example, people with aphasia will practice starting the conversation, or the partner may practice writing questions for the person with aphasia. SCI has three key elements, which include incorporating AAC, training communication partners, and promoting social communication (Turner & Whitworth, 2006). These underlying aspects of SCI represent a holistic approach to activity and participation based treatment (ASHA, 2014). The last type of partner approach is social and life participation effectiveness. This treatment approach focuses on re-adapting to life by increasing daily participation in activities chosen by the client (Chapey et al., 2000). This treatment emphasizes the real-life goals of individuals who have aphasia.

Pragmatic Treatment. Pragmatics are the rules that regulate how we use language when communicating with others. This includes using language to comment, request, warn or acknowledge in conversation. This area of communication involves using both linguistic and non-linguistic strategies to start and continue a conversation,

and to take turns speaking while having good-eye contact and facial expressions that are appropriate within the context of communication (Wright & Newhoff, 2005). Pragmatics determine why, when, and to whom a person produces speech. Pragmatic treatment addresses these communication rules and helps the client to understand these rules and abide by them in conversation (Wright & Newhoff, 2005). This kind of treatment focuses on difficulties with the social aspects of communication, including word choice and nonverbal communication. Although PACE is a multimodal treatment, as mentioned above, it is also an example of pragmatic treatment (ASHA, 2014).

Reciprocal Scaffolding. Reciprocal scaffolding is a treatment approach that facilitates interactive and natural communication between the client with aphasia and their communication partner. During this interaction, the communication partners take turns as either the expert or the novice. Each expert and novice has a specific set of knowledge that they are communicating about with their partner, facilitating a mutual interaction (Avent, Patterson, Lu, & Small, 2009). In this treatment setting, the expert is responsible for teaching the novice a new skill that the expert has superior knowledge of (ASHA, 2014). The novices actively learn this new skill through their interactions and communication with the expert (Avent, et al., 2009). In many aphasia treatments, the person with aphasia is the novice attempting to relearn language and communication skills, but in reciprocal scaffolding for aphasia, the person with aphasia is the expert and must teach a new skill to the novice (for example a graduate student clinician) (Avent et al., 2009).

Script Training. Script training is a treatment in which people with aphasia rehearse a personalized dialogue or monologue script until it becomes automatic,

allowing patients to communicate about a topic they are interested in (ASHA, 2014). The goal is that these scripts will be available to be used in real-life conversations. Clients move through a hierarchy of learning including choral reading (in unison with another speaker), and then to independent production of the script (Goldberg, Haley, & Jacks, 2012). This repeated practice of meaningful expressive speech helps clients to develop an automatic production of words and sentences that will help them to have more natural conversations (Goldberg et al., 2012).

Treatment Efficacy

Treatment efficacy depends on many factors, aside from the treatment itself. Research has shown that the effectiveness of therapy is based on the quantity and intensity of therapy (Basso et al., 2011). A study on the intensity of therapy found that patients who underwent 98.4 hours of treatment had better outcomes than those who only participated in 43.6 hours of treatment (Basso, et al., 2011). Treatment efficacy is also correlated with the quality and appropriateness of therapy. SLPs must be knowledgable about different treatment approaches through their understanding of evidence-based literature on different treatment methods (Drummond, 2006). This provides them with information to select appropriate goals and strategies in rehabilitation, which ultimately leads to positve outcomes following treatment.

Research has also found that different subcategories of aphasia seem to recover at different rates and to varying degrees (Bakheit, Shaw, Carrington, & Griffiths, 2007). There is much debate concerning the efficacy of aphasia treatment in general and how well this therapy helps in recovering language and cognitive skills. One study investigating the effectiveness of aphasia therapy found no strong evidence supporting or

denying the effectiveness of aphasia therapy (Code & Petheram 2011). However, single-case studies have shown that aphasia therapy can be effective. One single-subject study, for example, showed that the effect sizes for aphasia treatment are large (Robey, Shultz, Crawford, & Sinner, 1999).

Roles of SLPs

The above treatments are most often provided by SLPs with the primary purpose of recovering speech and language abilities. However, aphasia treatment is not exclusively designed for the rehabilitation of the language modalities. Complications from acquired brain injuries are multifaceted, thus the knowledge and skills of several professionals from different discliplines are necessary to maximize positive outcomes in the patient (Joint Committee, 2007). One highly important role of Speech-Language Pathologists is that they communicate and collaborate well on an interdisciplinary team to provide a comprehensive assessment process, treatment plan, and discharge plan (Joint Committee, 2007). In order to fulfill their own roles and responsibilities in aphasia therapy and rehabilitation, SLPs must be effective members of the rehabilitation team. Although there is no position statement defining specifically the role of SLPs in aphasia therapy, ASHA has developed roles for SLPs when working with patients who have cognitive-communication disorders. The roles outlined by ASHA include identification, assessment, intervention, counseling, collaboration, case management, education, prevention, advocacy, and research (ASHA, 2005b). A speech pathologist's distinctive role in treating aphasia is to maximize the recovery of language skills as much as possible and to teach patients how to compensate for language deficiencies (DeRuyter, Fromm,

Holland, Stein, 1996). The author has reviewed the literature concerning each of these roles and specifically how they relate to aphasia therapy.

Interdisciplinary Roles. SLPs must be aware of their responsibilities on an interdisciplinary team in order to focus on the recovery of language abilities in aphasia patients. ASHA and Division 40 of the APA, the Joint Committee on Interprofessional Relations, does not identify specific roles of the SLP. However, they have agreed that all disciplines relevant to neuropsychology should play a role in expanding the knowledge about this field, and provide appropriate treatment to patients in this population (ASHA, 1990). The committee developed the first set of guidelines on the topic in 1995 to help regulate the procedures and purpose of an interdisciplinary team and address how clinical services should be provided to individuals with brain injuries (Joint Committee, 2007). Members of the Joint Committee revised these general guidelines in 2007 and updated the terminology using the term "acquired brain injury" instead of "head injury" (Joint Committee, 2007). This change acknowledges the fact that brain damage may be due to causes such as tumor, stroke, or disease. A cognitive rehabilitation team is expected to collaborate and improve the care of patients, and their recovery outcomes (Joint Committee, 2007). Each discipline plays a role in advocating for individuals suffering with aphasia, and providing these patients with proper care and treatment. Working on an interdisciplinary team is an all encompassing role of the SLP in which they must carry out individual responsibilities along side other professionals.

Identification. Identification of a cognitive-communication disorder is described as identifying individuals who are at risk for cognitive-communication disorders, or show signs of a cognitive-communication disorder (ASHA, 2005b). Thus, the roles of

identification in aphasia are to recognize those suffering from aphasia and provide them with further assessment of their language abilities. Specifically, SLPs are held responsible to screen individuals who demonstrate difficulties with language and communication. Their role is to determine the need for additional assessment, and the need to possibly refer patients to other services (ASHA, 2014). Screening is the first step in identifying aphasia, and a patient must go through a screening process to determine the direction of further evaluation of their cognitive impairments and to identify the disorder.

There are two types of effective screening procedures currently used to help identify aphasia, these include: the bedside clinical examinations, and standardized specific function tests (Spreen & Risser, 2003). The bedside clinical examination has historically been the primary method of identifying aphasia. This screening procedure is simple and includes tasks from unstructured conversation to a more structured activity such as pointing to a watch or listing days of the week (Spreen & Risser, 2003). Standardized specific function tests are created to assess a specific aspect of language in a detailed and standardized manner. These tests measure certain language functions that are sensitive to the presence of aphasia (Spreen & Risser, 2003).

A screening determines the need for treatment, and is helpful to appropriately refer the patients to the services they need. An SLP or other qualified professional is able to perform a screening. Typically this examination evaluates oral motor functions, speech production skills, comprehension, and production of spoken and written language as well as cognitive aspects of communication (ASHA, 2014). A screening may result in many things, for example, a recommendation for a rescreening, referral for other evaluations or

services, or a comprehensive speech, language, swallowing, or cognitive-communication assessment (ASHA, 20014).

Assessment.If signs and symptoms of aphasia are identified after a screening is done, the SLP is responsible for performing a more comprehensive assessment of the patient. His or her job is to analyze the receptive and expressive abilities of the patient within the four modalities of language, which are speaking, listening, reading, and writing (Elbaum & Benson, 2007). The purpose of an assessment is to recognize strengths and weaknesses of spoken and written language, identify how the language disorder disrupts the functioning of daily activities, discover the contexts in which individuals will communicate more or less successfully, and assess how the language impairment has affected the patient's quality of life and how it has impacted his or her family (ASHA, 2014).) There are several steps performed in a typical assessment of aphasia (ASHA, 2014). The SLP will review the case history and learn about the medical status, education level, and occupation of the patient. The SLP is also responsible for being informed on the socioeconomic, cultural, and linguistic background of the client. The SLP will review the client's auditory, visual, motor, cognitive, and emotional status and select and administer standardized and nonstandardized assessments to properly evaluate them (ASHA, 2014).

Assessing individuals with aphasia can be done in several different ways using different measures. In some instances, an entire standardized test is administered, or the clinician may only administer specific subtests chosen from the standardized test battery. In other instances the clinician may develop nonstandardized assessment tools to survey aspects of speech, language, and cognition. The role of the SLP in aphasia assessment is

to conduct culturally and linguistically relevant assessments of language and communication, which will aid in diagnosing the presence of absence of aphasia (ASHA, 2014). The clinician is responsible for referring patients to other professionals if needed, and to help develop appropriate treatment plans that provide treatment, document progress, and determine appropriate dismissal criteria (ASHA, 2014).

Intervention. A primary role of SLPs when working with people who have aphasia is providing proper treatment and intervention. Aphasia treatment is designed specifically for the individual to focus on their needs and what specific goals they are trying to reach (ASHA, 2014). The purpose of treatment is to restore language abilities, strengthen intact language abilities, teach strategies for language compensation, train families and caregivers to communicate with people who have aphasia, improve skills in all contexts of communication, and educate patients and others about aphasia and the treatment and recovery process (ASHA, 2014).

The role of the SLP in intervention for cognitive-communication disorders is to choose evidence-based practices that are clinically, culturally, and linguistically appropriate for treatment of a patient's communicative difficulties (ASHA, 2005b). Specifically for aphasia, the basic goal of intervention is to improve a person's ability to communicate (NIDCD, 2008). Depending on the severity of their disorder, this could mean helping patients to use remaining language abilities, learn compensatory strategies, or learn different ways to communicate. Although some persons with aphasia may spontaneously recover some language abilities following a stroke or brain injury, therapy is helpful to maximize the recovery. Intervention is most effective when it is implemented in the early stages of recovery. Intervention for aphasia treatment should

begin as soon as is possible because the most positive changes can occur early after the onset of aphasia (ASHA, 2011).

Counseling. The SLPs responsibilities extend beyond treating the patient directly through language therapy. Counseling individuals with aphasia and advising their families about communication-related issues are included in the roles and responsibilities of the SLP (ASHA, 2014). SLPs should provide appropriate counseling for people and family members about the impact of cognitive-communication disorders (2005b). Counseling is important because it provides individuals, families, caregivers and others with information about aphasia and supports them in developing strategies to help enhance the recovery process (ASHA, 2004). The goal of counseling is to support individuals and their families in living as successfully as they can in spite of their unanticipated disorder. The clinician's job is to listen and understand the client's perspective, and guide the patient through their concerns and anxieties. The SLP is responsible for supplying information that will help the person with aphasia understand their disorder, and give them direction to continue with their lives in a realistic and optimistic way. All this information will be used by the clinician and the individual and translated into actions that promote the best possible recovery (Holland, 2007).

The type of disorder and the prognosis will affect the nature of counseling provided by a clinician. Disorders such as aphasia, and traumatic brain injury often have a positive prognosis because they present with conditions that are likely to improve with clinical intervention. Counseling in these situations would focus more on instilling acceptance of the disorder and fostering realistic and positive expectations (Holland, 2007). A more progressive prognosis, such as in dementia, primary progressive aphasia,

or brain tumors elicit a different form of counseling. Under these circumstances the clinician must work with the patient toward acceptance of this prognosis. It is important that the client learns to live well within the remainder of their life and, in the worst cases, deal with end-of-life issues (Holland, 2007).

Counseling is meant to assist individuals and to decide on appropriate goals that take advantage of strengths and address weaknesses that affect communication. The SLP must motivate the patient to become autonomous and facilitate activities that will help them to acquire and utilize necessary skills that will get them closer to their goals (ASHA, 2004). Counseling is also intended to help individuals learn to change and adapt to their environment in order to effectively communicate.

Collaboration & Case Management. The SLP is responsible for collaborating effectively to develop and apply strategies of assessment and intervention (2005b). These strategies are discussed with the patient as well as with family members, teachers, professional colleagues, and others who are relevant to the patient. In order to collaborate effectively, SLPs must include other services and professionals in the implementation of treatment for the patient (ASHA, 2005a). Clinicians must be adept at working well with a range of collaborative teams. They should also be able to communicate professionally and efficiently. The SLP is responsible to inform the referral sources of the client's case history and reasons for referral, and also must keep administrators, payers, and decision-makers up to date on the patient's progress (ASHA, 2005a). Case management and collaboration skills also include the ability to manage the use of resources sensibly based on the long-term or immediate needs of patients with aphasia, and their family members or caretakers.

Collaboration is a key aspect of assessing cognitive impairments and planning for rehabilitation (ASHA, 2003). For example, if SLPs and other professionals fail to work together, it may result in unnecessary testing. Assessing the patient will be more efficient if professionals act as a team and determine the best approach to overcoming obstacles. Well-collaborated assessments initiate intervention programs that are effective and consistent and also increase the patient's awareness of their communicative strengths and weaknesses.

Education. Another role played by the SLP in caring for individuals with aphasia is the role of an educator. Clinicians must educate future SLPs in assessment and intervention of this population of patients. They are also responsible for informing families, caregivers and other professionals concerning the patients needs while they are recovering from aphasia (ASHA, 2005b). Education is needed for those suffering with aphasia and their social circles. Proper education can help these individuals break down barriers of communication (Toner & Shadden, 2002). Information must be conveyed to patients in a way that they can understand; education should be personalized so that patients can comprehend their disorder and the options they have in treatment and other rehabilitation services (Cameron, 2013). Even though this is an important role in aphasia and stroke rehabilitation, a recent study found that the majority of participants reported they did not receive any written educational materials about aphasia (Rose, Worrall, McKenna, Hickson, & Hoffman, 2009). All professionals should offer appropriate forms of educational information.

Within the context of stroke victims and aphasia, much of the education is focused on helping families gain confidence and learn how to properly care for

individuals with aphasia once they are home. In a study concerning the needs of family members of individuals with aphasia, family members identified needs for information about aphasia, psychosocial support, and to be provided with hope (Avent et al., 2005). SLPs can empower family members and patients by providing them with the tactics they need to optimize the quality of life of aphasia patients. Education emphasizes the necessity of follow-up care and connects caregivers with resources such as home health care or therapy sessions.

Advocacy. Within the area of aphasia, SLPs are responsible for advocating for their patients who have this disorder and the patient's family. Advocating for this population can be done at the local, state and national levels (ASHA, 2014), and is important in the process of raising awareness, increasing funding, and reducing psychosocial isolation (Elman, R.J., Ogar, & Elman, S.H.). Advocacy in aphasia is important because aphasia is an unfamiliar term compared to other health conditions or communication disorders such as Parkinson's, Autism, or stuttering. One study searched the top 50 newspapers in the United States to investigate the number of times the words 'aphasia', Parkinson's disease', 'stuttering', 'muscular dystrophy', 'multiple sclerosis', and 'autism' were used in comparison to one another. Although the incidence rates of aphasia are similar to or higher than most of the other disorders, it has been used the least in print (Elman et al., 2000). When aphasia was mentioned in these articles, it was often used out of context and not fully defined or explained. In an effort to increase advocacy and awareness, ASHA has created a sub-group of the Neurogenics Special Interest Division 2. This secondary committee is focused specifically on spreading awareness of neurogenic communication disorders, including aphasia.

Another important role of SLPs is to help patients advocate for themselves. Research has discovered that promoting self-advocacy in people who are living with aphasia can result in both direct and indirect benefits (Elman et al., 2000). Teaching patients to advocate for themselves is an important part of aphasia rehabilitation, however people who have aphasia cannot always be vocal activists for their disorder because of the way that aphasia affects language. SLPs must take on the role of activist and promote awareness at all levels including political and judicial (Elman et al., 2000).

Prevention. Prevention involves informing the public on the factors that lead to cognitive-communication disorders (ASHA, 2005b). ASHA's policy statement on prevention (1988) identifies three different levels of prevention concerning communication disorders: primary prevention, secondary prevention, and tertiary prevention. Primary prevention is explained as the inhibition of a disorder by reducing factors that might lead to the onset. Secondary prevention is defined as the early recognition and intervention of a disorder that aims to prevent severe cognitive deficits. Tertiary prevention refers to rehabilitation of the disorder in an attempt to restore functional abilities that the patient may have lost at the onset of the disorder (ASHA, 1988). Because aphasia is primarily an acquired symptom resulting most often from a stroke, primary prevention is geared towards the prevention of stroke whereas secondary and tertiary prevention refers to intervention for aphasia.

A person who has suffered from a past stroke has a 43% risk of experiencing a second stroke (Wright et al., 2012). Primary prevention for stroke will include the management of risk factors such as cholesterol and blood pressure. SLPs must collaborate with other professionals to ensure that primary prevention strategies are in

place, and inform the patients' families of these risk factors as well (Wright et al., 2012). Secondary and tertiary prevention will be included in the roles of identification, assessment, and intervention; these tasks are aimed at preventing further language deficits and restoring language to a functional level.

Research. According to the roles of SLPs working with cognitive-communication disorders, SLPs have the responsibility to use research to advance the information of these disorders, including their treatment (ASHA, 2005b). SLPs remain informed on the current aphasia research and work to expand the data relating to the nature of aphasia and how it is treated (ASHA, 2014). Research in aphasia can be either quantitative or qualitative. The purpose of qualitative data is to understand the client's perspective. This method of study allows researchers to get a thorough understanding of the experiences of a person with aphasia, and it helps to understand the complexities of the disorder (Skeat & Perry, 2008). A quantitative study focuses more on gathering information about clients. This method can be performed with a larger number of participants and often uses statistical analyses to explore the data (Dalemans, Wade, Van den Heuvel, & De Witte, 2009).

There are a wide wide variety of research topics available within aphasia. In one study it is reported that most research within aphasia concentrated on the perceptions of the experience of aphasia (Simmons-Mackie & Lynch, 2013). Secondary to this general subject, sub categories could include the perspective of people who have aphasia, or the perspectives of their family members, the meaning of quality of life with aphasia, and views on well-being, psychosocial adjustment and identity in aphasia. Research can also relay information about specific interventions. Research participants vary, including

those who have aphasia, their family members and significant others, SLPs, other service providers, and employers. It is important to note that when including people with aphasia as research participants, it is sometimes necessary to use strategies that help those with communication impairments (Dalemans et al., 2009). Research questions are often language-based, thus it is difficult to include people who have language impairments, such as people with aphasia. Adjustments must be made to allow people with aphasia to participate in studies, thus giving researchers and SLPs insight into the complexities of this disorder.

Perceived Roles of SLPs

As the SLPs' scope of practice has expanded, SLPs have had to assume more roles including roles on an interdisciplinary team and the ability to collaborate with other professionals in different settings. Especially in healthcare settings, SLPs have increased roles and are expected to have specialized knowledge and skills in order to serve a specialized population, such as aphasia (Coordinating Committee, 2009). One study surveyed final-year SLP, physical therapy (PT), and occupational therapy (OT) students on their perceptions toward stroke rehabilitation teams and the SLPs' role on this team (Insalaco, Ozkurt, & Santiago, 2007). The results of the survey showed that in general, all the students, including both PT and OT, agreed that SLPs do have a role in treating aphasia. However, OT and SLP had different opinions on the role of SLPs in treating memory impairments. The researchers concluded that OT students may not understand that the SLP curriculum includes neuroscience courses, which involve learning about the rehabilitation of individuals with brain injury (Insalaco et al., 2007). When collaborating with other professionals, it is important for SLPs to be aware of their roles as well as the

roles of other professionals they will be working with. This will ultimately provide patients with better care and more holistic treatment.

Another study investigated the perceptions of SLPs and neuropsychologists (NPs) concerning both of their roles in rehabilitation (Sander, Raymer, Wertheimer, & Paul, 2009). The data in this study indicated that both SLPs and NPs viewed SLPs as the primary treatment providers. The results also showed that there is much overlap between the roles of SLPs and NPs in a rehabilitation setting. This research was focused on the collaboration of SLPs and NPs in a rehabilitation setting and reiterated the importance of graduate level education. The researchers in this study concluded that education concerning roles and collaboration of professionals from different fields should be emphasized when students are earning graduate-level degrees within these disciplines (Sander et al., 2009).

Several studies, such as those reviewed above, have researched the perceptions of SLPs and their role in rehabilitation settings with other professionals. However, little research was found on SLPs perceptions of their own roles in rehabilitation. In order for SLPs to collaborate well with other professionals, they must be aware of their own roles and responsibilities when working in various settings with specific populations of patients. The lack of information on SLPs perceptions of their own roles prompted the researcher to ask the following questions about SLPs and their roles.

Research Questions

Based on personal interests and information gained through reviewing literature on the topic of aphasia and the SLPs' role in rehabilitation, the researcher has formulated three hypotheses that will be explored in this study.

1. SLPs with their Masters degree and a Certificate of Clinical Competence do feel prepared to work with patients who have aphasia, even within varying age or type of aphasia.
2. SLPs are familiar with all their roles and responsibilities when working with patients who have aphasia and feel that the most important role is to provide appropriate therapy to these patients.
3. A majority percentage of SLPs with a Masters degree and a Certificate of Clinical Competence are not completely aware of the wide range of therapy programs available for aphasia rehabilitation.

CHAPTER III

METHODOLOGY

Participants

Participants of this study were ASHA certified speech-language pathologists who have received their Master's degree and hold their Certificate of Clinical Competence (CCC). Participants were identified through faculty directories of accredited communicative sciences and disorders programs, and also by contacting hospitals and skilled nursing facilities directly. In order to take part in this study, the researcher requested that SLPs have at least one year of experience in a medical setting following their clinical fellowship year (CFY). However, as represented by the last question in the survey, participants had received their CCC-SLP between the years of 1969 and 2013, suggesting that some participants had not finished at least one year of field experience following the completion their CFY. The participants voluntarily completed an electronic survey that was created using an online survey system. Participants received an email containing a brief explanation of this study and a link to the survey. A copy of the electronic survey is presented in Appendix C.

The SLPs' email addresses were not organized location, or any other category in order to randomize the selection of participants. The email containing the survey was originally sent to 255 email addresses that were obtained by contacting hospitals or skilled nursing facilities. Follow-up emails were sent to this group of respondents at 30 days following the initial distribution, and a second follow-up email was sent after an additional 13 days. Due to a low response rate, 264 new participants were identified through consulting websites of accredited speech-language pathology programs.

Participants were contacted if their information indicated that they hold their CCCs and have had some experience in a medical setting. This group was sent a follow-up email at 30 days after the initial mailing. The survey email was sent to a total of 519 SLP emails. Some email recipients responded that they did not have their CCC or had not obtained at least one year of experience in a medical setting following their clinical fellowship year. Others responded that they had forwarded the survey to other SLPs who work in a medical setting who would be interested in taking the survey.

A letter to the participants was included in the body of the email to obtain informed consent for the completion of the survey (see appendix A). The letter provided information about the study and it's purpose. The letter included that the participants' responses would be anonymous and that by completing the study the respondent is consenting to the use of their responses in the study. A copy of the results will be available to participants if they wish to view them. Those interested in viewing the results were prompted to provide their email address. To ensure confidentiality, all data gathered will be destroyed one year following the completion of the study.

This study used inclusive criteria to choose a broad range of participants within the discipline of speech-language pathology. The researcher wished to examine the general knowledge that SLPs have about aphasia and its rehabilitation process even if they are not currently working in a medical setting. This study provided basic information about ASHA-certified SLPs' understanding and familiarity of aphasia and the role that SLPs play in rehabilitation. This study could be redesigned in the future to compare the responses of SLPs who work in a medical setting with those who work in a school setting, or another facility such as a private practice.

Instrumentation and Electronic Communication

The survey for this study was formed and distributed using Qualtrics Survey Software through the University of Mississippi's subscription (Qualtrics, 2014). The Qualtrics program allows users to create and distribute surveys and collect data in an efficient way. When forming surveys, there are over 100 possible question types. The program also has many options for the distribution of surveys, including the ability to send reminder and thank you emails. The software is able to report data using different methods. Responses can be reported for each participant, or for each separate question. Qualtrics includes over thirty forms of charts and graphs to view collected information.

The electronic survey for this research consisted of seventeen questions. The majority of the questions were multiple-choice questions. Questions five, eight, and fourteen allowed participants to select more than one answer choice. These questions asked the SLP to select all the types of aphasia they are familiar with, all the roles that they think should be included in aphasia therapy, and all the treatment with which they are familiar with. Qualtrics survey software recorded survey responses as the survey was completed. The data for completed surveys was accessible at any time even while the survey was still open.

Survey questions were based on the Roles and Responsibilities found under *Clinical Topics: Aphasia* (ASHA, 20014). The questions were intended to evaluate how familiar SLPs are with the roles and responsibilities of working with patients who have aphasia, and which responsibilities they believe to be the most important. The survey also compared SLPs' preparedness when working with patients of different age groups and who have different types of aphasia.

Survey Questions

The first two questions of the survey investigated the level of education that the SLP received concerning aphasia. Question one asked if the SLPs graduate program included curriculum courses relating to aphasia therapy practice. The goal of this question was to investigate whether speech-language pathology programs across the country are preparing students to work with people who have aphasia. Speech-language pathology programs should educate students about aphasia, so that they are prepared to work with this population. If SLPs are not provided with proper education in specified areas of practice, such as aphasia, they will not be able to effectively treat these patients and give them the proper care that is needed. Appropriate education is vital if SLPs wish to provide successful intervention for this distinctive disorder.

The second question of the survey also inquired about the education that respondents received when earning their Masters degree, and is closely connected to question one. Question two asked the SLPs if they felt prepared for a possible career in an aphasia center upon receiving their graduate level degree. Question two expanded on question one by asking for the participants' personal judgment on how well their graduate program prepared them for work with people who have aphasia. Previous research has found that although students have received coursework related to aphasia, they were not fully prepared to communicate with people who have aphasia and effectively treat these patients (Finch et al., 2013). In addition to theoretical coursework, students need to have practical, hands-on training as well. The goal of this question was to study whether

aphasia education material thoroughly prepared speech-language pathology students on a theoretical and practical level.

Question three asked respondents to indicate which population they feel more prepared working with when providing treatment. The question was followed by two choices which included patients fifty and older, and patients forty-nine and younger. This question was designed to explore how well SLPs are being prepared to work with patients across different age populations. Although aphasia is found mostly in older adults, it can also occur in younger adults and even children. SLPs should be prepared to work with any population that is suffering from this disorder, especially when working in a medical setting.

The fourth question of the survey asked the respondents how often they saw patients who had aphasia. The question was followed by five answer choices in which the respondents were only allowed to choose a single answer. The answer choices included once a year, a few times a year, once a month, a few times a month, and every week. The purpose of this question was to determine how frequently SLPs are treating patients with aphasia.

Question five was created to support the researcher's hypothesis that SLPs are prepared to work with individuals who have aphasia regardless of the type of aphasia presented by the patient. Question five asked the participant to identify all the forms of aphasia that they are familiar with, based on their experience. The question was followed by eleven answer choices that included the most general types of aphasia, as outlined in the ASHA Common Classifications of Aphasia document (2007a). These answer choices included global aphasia, Broca's aphasia (non-fluent aphasia), conduction aphasia,

Wernicke's aphasia (fluent aphasia), anomic aphasia, transcortical sensory aphasia, transcortical motor aphasia, mixed transcortical aphasia, crossed aphasia, subcortical aphasia, and primary progressive aphasia. Participants were able to choose all answer choices that applied to their knowledge and experience with aphasia.

Question six of the survey asked respondents how many patients with aphasia they have treated. This question was followed by four answer choices which included 1-5, 5-10,10-20, and more than 20 patients. Although this question is similar to question four, question six was designed to measure the total number of patients an SLP works with in contrast to the number of patients an SLP might see in a year.

Question seven investigated the most common cause of aphasia onset. The question requested SLPs to identify, based on their experience, the most common type of brain injury that resulted in aphasia. The respondents were able to choose between stroke, traumatic brain injury, and brain tumor. This question was designed to investigate the distribution of aphasia's possible etiologies based on the first-hand experience of SLPs.

Question eight of the survey asked SLPs to identify all of the roles and responsibilities that they thought applied to SLPs in aphasia treatment. The purpose of question eight was to discover which roles SLPs commonly assume when providing services to individuals with aphasia, and which roles they believe that SLPs are not responsible for. This question included seventeen answer choices in which respondents were able to select any or all of the given choices. Each of the roles and responsibilities listed were based off the roles and responsibilities attributed to SLPs in the ASHA document *Clinical Topics: Aphasia* (2014), and the ASHA policy document *Roles of Speech-Language Pathologists in The Identification, Diagnosis, and Treatment of*

Individuals with Cognitive-Communication Disorders: Position Statement (2005b). The Aphasia Clinical Topics source includes a section pertaining only to the roles and responsibilities of SLPs in every aspect of aphasia rehabilitation. This page lists many roles, but the SLP is not limited to these roles. Depending on the client and the clinician, roles may vary. The position statement notes that roles also are determined in collaboration with the individual with the cognitive-communication disorder (ASHA, 2014). In aphasia rehabilitation, the etiology, type and severity of aphasia, and the strengths and weaknesses of the client's language and functioning must be considered in determining the specific roles of the SLP.

The goal of question nine was to investigate which role SLPs believe to be the most important in aphasia rehabilitation. Question nine asked the SLP to identify which role they consider to be the main role in aphasia rehabilitation. The participant was prompted to choose between facilitating therapy to patients, or consulting and collaborating with family members and caregivers.When reviewing the literature for this thesis, the researcher discovered that much of aphasia rehabilitation is aimed at improving the quality of life. The main goal of rehabilitation is to help patients achieve a high-level of functioning that will enable them to continue living as they were before their injury. SLPs are responsible for both facilitating therapy to patients and to consult and collaborate with family members or caregivers (ASHA, 2014). This question investigated participants' opinions regarding which role they believe is more important.

Question ten asked participants to indicate if they have attended or participated in any seminars, conferences, or continuing education courses after graduate school in order to broaden their knowledge and skills specifically concerning aphasia and it's therapy.

The goal of this question was to determine if SLPs in medical settings are choosing to participate in aphasia related education. Information concerning treatment and evidence-based practice is constantly changing and growing, and it is important for SLPs to expand their knowledge base despite their previous education on aphasia in graduate school. The results of this question indicate whether participating SLPs understand the need to broaden their knowledge and skills concerning aphasia and it's therapy, especially when working in a medical setting.

Question eleven asked participants to report whether or not they feel confident in conducting a comprehensive assessment of a patient who is suspected to have aphasia. ASHA's position statement *Roles of Speech-Language Pathologists in the Identification, Diagnosis, and Treatment of Individuals with Cognitive-Communication Disorders* (2005b) explains that SLPs must be able to select and utilize appropriate techniques to assessment and diagnosis of cognitive-communication disorders. Question eleven was designed to study how confident SLPs are in fulfilling this role in a medical setting, given that this role pertains to all cognitive-communication disorders and not only aphasia.

Question twelve asked respondents if they had participated in public education and advocacy for those suffering with aphasia. SLPs are responsible for advocating for those with aphasia and their families at the local, state, and national levels (ASHA, 2014). There have been consistently low rates of public knowledge about aphasia and how it affects individuals who have the disorder (Sheratt, 2011). Public awareness of aphasia is considerably low when compared to the awareness of other disorders such as Parkinson's disease or Autism. Awareness affects policy and funding, but more importantly it affects the individual with aphasia, especially when rejoining the community (Sheratt, 2011).

The purpose of question thirteen was to explore how confident SLPs are in their ability to teach families and others to communicate with people who have aphasia. This question asked participants to indicate if they are knowledgeable on how to train families to effectively communicate with persons who have aphasia. One aim of aphasia treatment is to train families and caregivers to communicate well with their family member who has aphasia (ASHA, 2014). The SLP must teach family members to modify their communication strategies in order to reveal communication abilities in those with aphasia. Although it is not listed specifically under a role of SLPs in aphasia rehabilitation, teaching families to communicate with their loved ones who have aphasia is a vital part of treating the disorder. Question thirteen shows how familiar and comfortable SLPs are in providing proper communication strategies for families.

Question fourteen asked participants to identify the familiar treatment options. The question is followed by fifteen answer choices in which respondents were able to select any or all of the options. Each of the answer choices was a treatment listed by ASHA in the treatment section of *Clinical Topics: Aphasia* (2014). This list is not a complete list of possible treatments for aphasia, but it does include both general and specific treatments. The list includes treatments that are based on different approaches such as body function impairments, or communication activity and participation. The purpose of question fourteen was to study how familiar SLPs are with the treatment approaches that are listed by ASHA (2014), and to investigate the hypothesis that a majority of masters-level SLPs holding their CCCs are not completely aware of the wide range of therapy programs available for aphasia rehabilitation.

Question fifteen asked respondents to report whether or not they have seen noticeable improvements in people with aphasia as a result of these treatments. While researching the literature on aphasia, the researcher discovered that there is controversy concerning treatment efficacy for aphasia. The effectiveness of a treatment often depends on factors outside of the treatment itself, such as the type and severity of aphasia.

The last two questions of the survey are general questions for the participating SLPs and will not be analyzed in the results section of this thesis. Question sixteen asked what year the participant received their CCC-SLP, and questions seventeen asked participants to include their email address if they wish to see the results of this study.

Statistical Analyses

The survey software summarized the participants' responses by providing a graph for each question. The researcher used types of central tendency statistics (mean, median, and mode) in order to evaluate the general understanding of, and familiarity with aphasia and its rehabilitation and to analyze the data.

CHAPTER IV

RESULTS

A survey was developed and distributed by email to SLPs with a Masters degree and a Certificate of Clinical Competence who have previous or current experience in a medical setting. The survey questions were designed to review SLPs' opinions pertaining to aphasia rehabilitation. The survey assessed SLPs' familiarity with their roles in aphasia rehabilitation, their level of preparedness to work with this population, and their awareness of possible aphasia treatments. Surveys were emailed through the Qualtrics software program to an initial 255 SLPs who were sent reminder emails periodically. A low response rate prompted the researcher to send the survey to an additional 264 SLPs. The survey yielded a total of 105 responses, and the following are the results of those responses.

Results

Question 1 asked participants if their SLP graduate programs included curriculum courses relating to aphasia therapy practice.

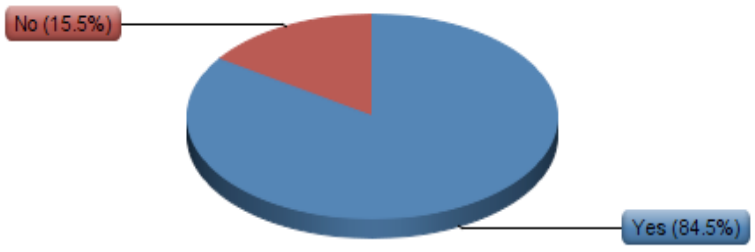

Figure 1. Presence of Aphasia Practice Courses in Graduate Programs Attended by Participating SLPs (n=103)

The results of question one are represented in Figure 1 on the previous page. Question one asked participanits if their SLP graduate programs included curriculum courses relating to aphasia therapy practice. The majority of SLP respondents (84.5%) indicated that their masters-level programs included curriculum pertaining to aphasia therapy practice courses. These results show that a majority of the participants have been educated about aphasia through their graduate programs.

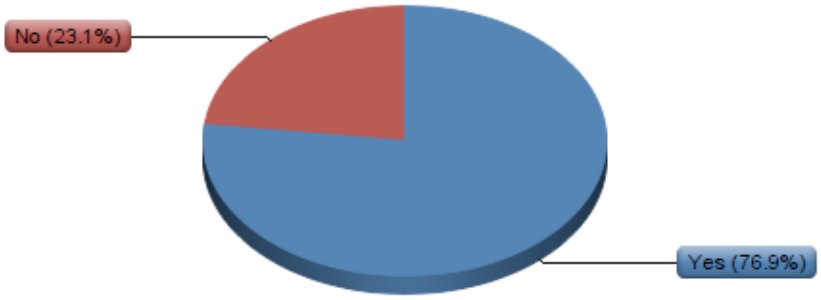

Figure 2. SLPs Who Felt Prepared For Work In an Aphasia Center After Receiving Their Graduate Degree (n=104)

The results of question two are displayed in Figure 2 above. Question two investigated the researcher's hypothesis that SLPs with their Masters degree and Certificate of Clinical Competence do feel prepared to work with patients who have aphasia. The results from question one illustrated that a majority of the participants had received education on aphasia and its rehabilitation during graduate school. Question two showed that a majority of respondents (76.9%) felt prepared to work in an aphasia center upon receiving their graduate-level degree. This correlates positively with the 84.5% of

participants in question one that indicated they had received education on aphasia in graduate school.

The results of question three, shown in Figure 3 below, demonstrate that only slightly more respondents (58.3%) are prepared to work with populations of patients who are 50 years old or older as compared to patients who are younger than 50 years old. When preparing the literature review for this study, the researcher discovered that aphasia occurs most often as a result of stroke and thus has a higher prevalence in older adults. It is possible that these results are due to the higher prevalence of aphasia occurring in older adults.

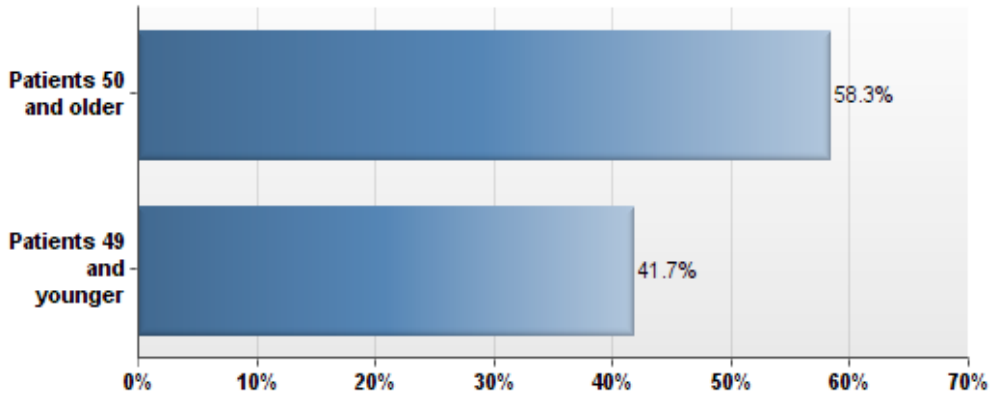

Figure 3. Which Population Are SLPs More Prepared To Work With (n=103)

The results of question four are displayed in Figure 4 on the next page and show that 46% of SLPs indicated seeing aphasia patients every week. A large majority (78%) of SLPs see patients with aphasia more often than once a year. Although this is a small

sample size, it can be inferred that aphasic patients are regularly on the caseload of an SLP working in a medical setting.

Frequency		%
Every week		46%
Once a year		22%
A few times a year		22%
A few times a month		6%
Once a month		4%
Total		100%

Figure 4. How Often SLPs Treat Patients Who Have Aphasia (n=97)

The results of question five, shown below in Figure 5, on the following page do not strongly support the researcher's hypothesis that SLPs are prepared to work with individuals who have aphasia regardless of the type of aphasia presented by the patient. Although SLPs indicated that they are prepared to properly care for and treat people with aphasia, all responding SLPs are not familiar with every common classification of aphasia as outlined by ASHA (2007a). Almost all participants were familiar with Wernicke's aphasia (99%), Broca's aphasia (98%), global aphasia (94%), and anomic aphasia (83%), but only around half of the participants were familiar with conduction aphasia (62%), transcortical sensory aphasia (58%), primary progressive aphasia (57%), transcortical motor aphasia (52%), mixed transcortical aphasia (46%), and subcortical aphasia (41%). Very few respondents were familiar with crossed aphasia (26%).

Type of Aphasia		%
Wernicke's aphasia (fluent aphasia)		99%
Broca's aphasia (non-fluent aphasia)		98%
Global aphasia		94%
Anomic aphasia		83%
Conduction aphasia		62%
Transcortical sensory aphasia		58%
Primary Progressive aphasia		57%
Transcortical motor aphasia		52%
Mixed transcortical aphasia		46%
Subcortical aphasia		41%
Crossed aphasia		26%

Figure 5. Percentage of SLPs Who Are Familiar With Various Types of Aphasia (n=103)

The results of question six are represented in Figure 6 on the following page and show that a large majority (73%) of SLPs who have worked in a medical setting, have worked with more than 20 patients who have aphasia. There are many factors that could affect the outcome of this question. SLPs who have been in the field for a long period of time, have most likely worked with more cases of aphasia. SLPs who have more recently received their CCC have most likely seen fewer patients in general, thus have had less experience with clients who have aphasia.

Number of Patients		%
5-10		3%
10-20		11%
1-5		14%
More than 20		73%
Total		100%

Figure 6. The Number of Patients Who Have Aphasia That SLPs Have Worked With (n=103)

The results of question seven are displayed in Figure 7 below. Almost all the SLPs (93.3%) indicated that stroke was the most common cause of aphasia that they had seen in the patients they have worked with. Only 5.8% of the SLPs indicated that the most common cause of aphasia in patients they have worked with was traumatic brain injury, and only 1% selected brain tumor as the most prevalent onset of aphasia.

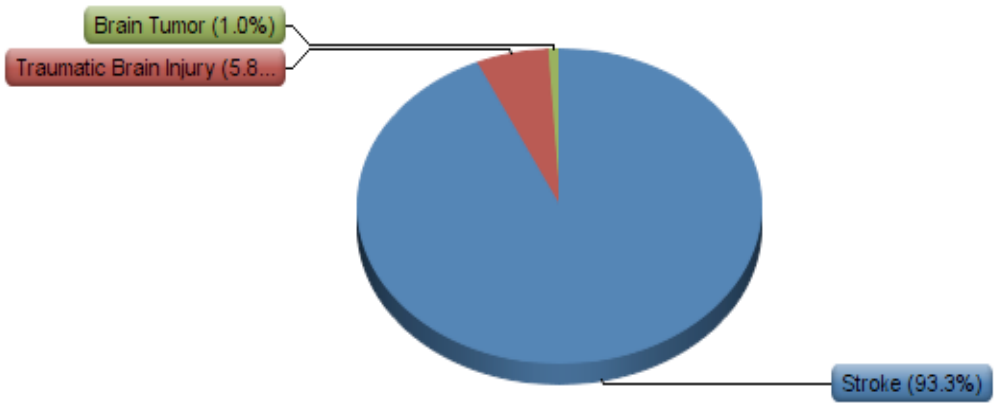

Figure 7. Percentage of Brain Injuries Resulting in Aphasia (n=104)

Answer	%
Developing treatment plans	100%
Providing treatment	100%
Assessing language and communication	99%
Documenting progress	99%
Educating other professionals	98%
Counseling persons with aphasia and their families	98%
Remaining informed of research in the area of aphasia	98%
Consulting and collaborating with other professionals	98%
Consulting and collaborating with family members or caregivers	97%
Determining the need for further assessment and/or referral for other services	97%
Determining appropriate dismissal criteria	97%
Referring to other professionals	97%
Advocating for individuals with aphasia and their families	96%
Diagnosing the presence of absence of aphasia	94%
Helping advance the knowledge of aphasia treatment	91%
Screening	88%
Providing prevention information	77%

Figure 8. Percentage of SLPs Who Identified Each Role as One That Should Be Included In SLPs Responsibilities In Aphasia Treatment (n=104)

Figure 8 above displays the results of question eight. The results of this question demonstrate how familiar the participants are with the roles of aphasia rehabilitation that are outlined by ASHA. Nearly all of the participants indicated that all of the tasks and duties listed should be included in the roles and responsibilities of SLPs in aphasia rehabilitation. Both developing treatment plans and providing treatment received a

response of 100%. All SLPs in this study perceived these as necessary responsibilities. It is noted that only 77 % of participants indicated that providing prevention information should be included in the roles and responsibilities of SLPs in aphasia rehabilitation. Although a majority of respondents included this task as a responsibility, providing prevention information had the lowest percentage of SLPs who believed this role should be included in the responsibilities of an SLP.

Question nine asked participants to identify which role they believe should be the main role of SLPs in aphasia rehabilitation. The researcher was interested in which approach SLPs find more effective in achieving the goal of rehabilitation, and assimilating clients back into their everyday functioning. As shown in Figure 9 below, a vast majority (87.1%) of participants believed that facilitating therapy to patients is the most important role of the SLP in aphasia rehabilitation.

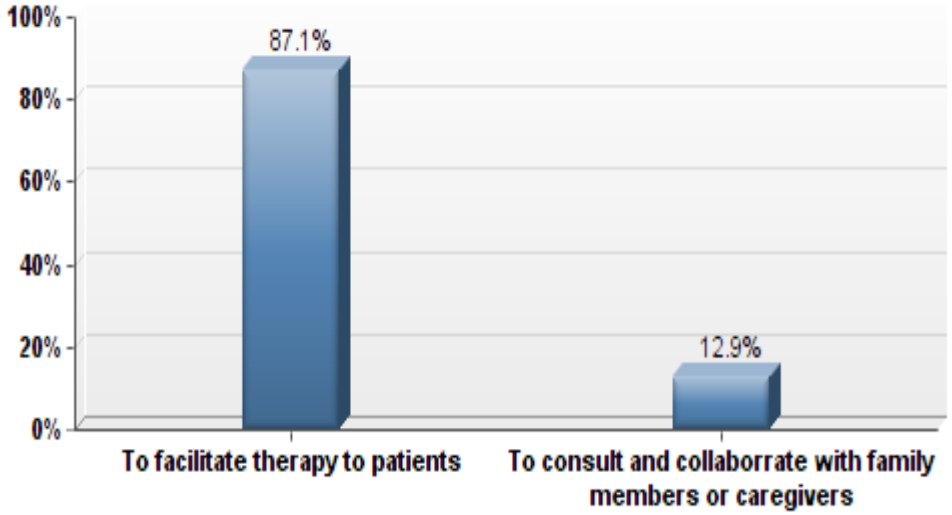

Figure 9. SLPs' Opinion of Main Role in Aphasia Rehabilitation (n=101)

As illustrated in Figure 10, 80.8 % of participating SLPs indicated that they have attended seminars, conferences, or continuing education courses to increase their knowledge and expand their skill set regarding aphasia and it's therapy. A small portion (19.2%) of respondents chose not to participate in expanding their knowledge of aphasia rehabilitation, possibly indicating they do not feel the need to pursue further education on the subject. These results are very similar to the percentage of SLPs who felt prepared for work in an aphasia center after receiving their graduate degree. 76.9% of SLPs were prepared for practice in aphasia rehabilitation, compared to the 80.8% who took part in continued education. This demonstrated that only a small number of SLPs who were not prepared to work with aphasic patients, pursued further knowledge of this specific population. Those who did not choose to continue education in aphasia may not feel the need to learn more about this disorder and its treatment depending on the patients that they see. These clinicians may see patients with other communicative disorders and choose to engage in continuing education that furthers their knowledge in areas more relevant to their practice.

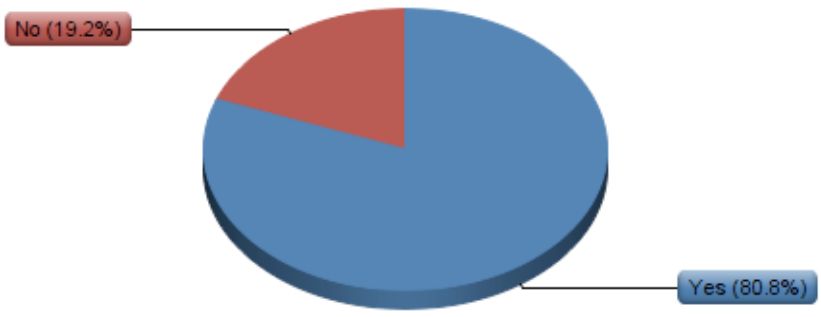

Figure 10. Percentage of SLPs Who Have Participated in Continuing Education Concerning Aphasia Therapy (n=104).

The results of question eleven are displayed in Figure 11 on the following page. It is shown that a large majority of participants (80.6%) are confident in performing assessments with aphasic individuals. Again, this percentage is similar to that of the respondents who felt prepared for work in the field of aphasia following graduate school (76.9%) and those who experienced practice courses in aphasia while in graduate school (84.5%), and those that have been involved in continuing education for aphasia (80.8%). These results suggest a positive correlation between education, confidence, and ability in practicing aphasia rehabilitation.

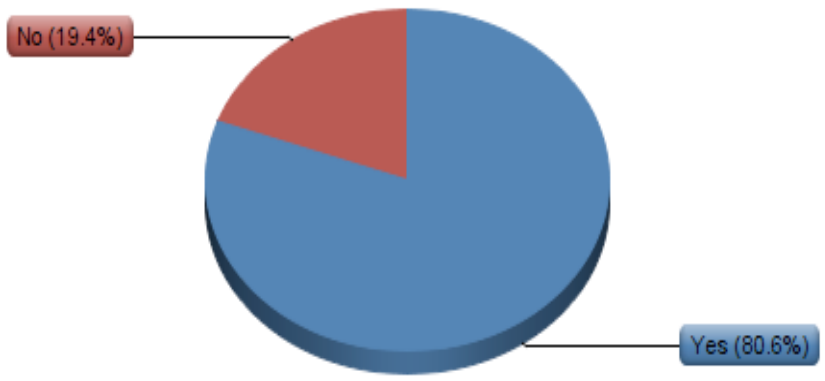

Figure 11. Percentage of SLPs Who Felt Confident Performing a Comprehensive Assessment of a Patient with Aphasia. (n=103)

The outcomes of question twelve are displayed in Figure 12 on the following page. Half of the SLPs surveyed indicated that they had participated in advocacy and spreading awareness of aphasia. Although 96% of the respondents demonstrated that they were familiar with the role of advocacy, only 50% of respondents reported participation in educating the public about this cognitive-communication disorder.

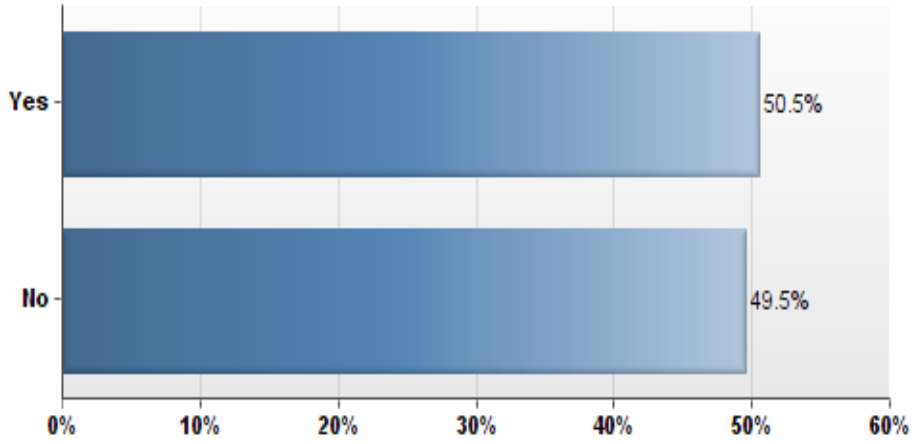

Figure 12. SLPs Participating in Public Education and Advocacy for Those With Aphasia (n=103)

As indicated in Figure 13 on the following page, an overwhelming majority of participants (81.7%) indicated that they are knowledgeable on training families to communicate effectively with people who have aphasia. This high percentage correlates positively with the perceived roles of SLPs as demonstrated in question eight. Nearly all SLPs believed that providing treatment and collaborating with family members or caregivers are necessary roles of the SLP. Given the percentage of respondents that are knowledgeable on providing communication strategies to families (81.7%), it can be inferred that SLPs who recognize a certain role in aphasia rehabilitation, are prepared to also provide these services.

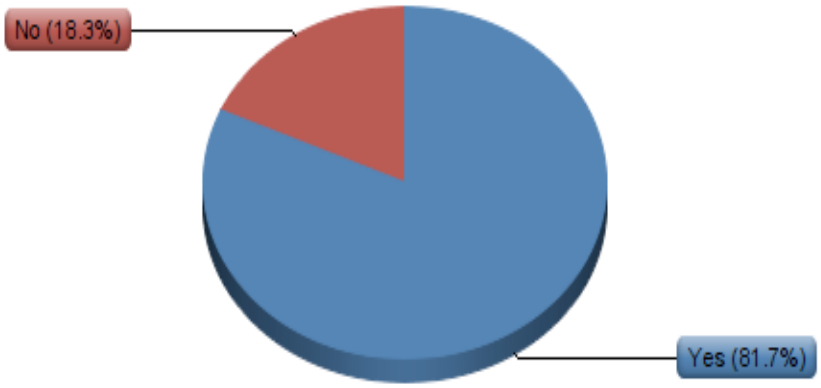

Figure 13. SLPs Knowledgeable on Training Families to Communicate Effectively With People Who Have Aphasia (n=104)

The results of question fourteen indicated that a majority of the participants who are masters-level SLPs holding their CCCs are not completely aware of the wide range of therapy programs available for aphasia rehabilitation. This hypothesis was confirmed based on the evidence shown in Figure 14. Although language-impairment based treatment, word finding treatment, melodic intonation therapy, multimodal treatment, pragmatic treatment, writing treatment, reading treatment, script training, and syntax treatment were chosen by over 60% of participants, the other six treatment approaches were not familiar to a majority of SLP respondents. There are many more treatment approaches than the ones listed in question fourteen. These data support the hypothesis that a majority of SLPs will not be aware of the range of therapy approaches. If a majority did not indicate familiarity with all the treatments listed by ASHA, then SLPs

will most likely not be completely aware of the many other treatment approaches for aphasia.

Answer		%
Language-impairment based treatment		93%
Word finding treatment		91%
Melodic Intonation Therapy		86%
Multimodal treatment		74%
Pragmatic treatment		73%
Writing treatment		72%
Reading treatment		71%
Script training		69%
Syntax treatment		64%
Computer-based treatment		59%
Partner approaches		50%
Constraint Induced Language Therapy (CILT)		47%
Reciprocal scaffolding		37%
Treatment of underlying forms		30%
Verb Network Strengthening Treatment		25%

Figure 14. SLPs Familiarity With Aphasia Treatments (n=101)

The results of question fifteen are shown in Figure 15. The purpose of this question was to investigate the general opinion of participating SLPs on the efficacy of aphasia treatments. Nearly all of SLP participants (92.8%) indicated that they had seen marked improvements in their clients who received treatment for aphasia. Because this is a small sample of SLPs, it cannot be concluded that all treatments in all contexts will prove to be effective.

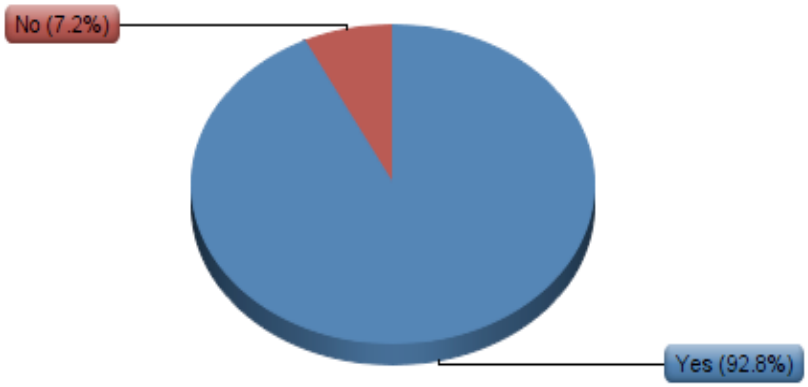

Figure 15. Percentage of SLPs That Saw Noticeable Improvements in People With Aphasia Resulting From Treatment (n=97)

Analysis

The outcomes of this study point the researcher towards a few conclusions. First, a majority of SLPs had participated in aphasia therapy practice courses within their graduate-level degree programs and also were prepared for working with aphasia upon completing their graduate-degree. Of the participants, 84.5% of SLPs took courses in aphasia, and 76.9% of SLPs felt prepared to work with aphasic patients. There is a positive correlation between the incorporation of aphasia courses in upper level education and the extent to which SLPs are prepared to enter the field. It was also found that SLPs are slightly more prepared to work with patients who are 50 and older. SLPs are also not extremely familiar with transcortical sensory aphasia, primary progressive aphasia, transcortical motor aphasia, mixed transcortical aphasia, subcortical aphasia, and crossed aphasia, as less than 60% of the participants indicated that they were familiar with these types. These results led the researcher to accept the first part of the hypothesis which states that SLPs who have their Masters degree and hold their CCCs feel prepared to

work with patients who have aphasia. However, the second part of the hypothesis stating that SLPs level of preparedness is the same when treating patients of different ages and different types of aphasia, was rejected.

Secondly, SLPs are aware that they have many roles and responsibilities within aphasia rehabilitation. Of the roles listed, SLPs selected all the roles as important with a strong majority. All roles except for one received a percentage of responses between 88-100 with most falling between 90% and 100%. The role of providing prevention information only received 77% of the responses, which is low compared to the high percentages of the other roles. However, each role was identified by more than 60% of the respondents. SLPs were highly knowledgeable of their possible roles in aphasia rehabilitation, and agreed with all the roles that are outlined by ASHA (2014). When prompted to choose which role SLPs believed to be the main role in aphasia treatment, most participants agreed that facilitating therapy to patients is the main responsibility of SLPs. The second hypothesis was accepted on the basis of these results. The second hypothesis stated that SLPs are familiar with all their roles and responsibilities when working with patients who have aphasia and feel that the most important role is to provide appropriate therapy to these patients. SLPs identified all seventeen responsibilities listed as being important to aphasia therapy. A majority (87.1%) also believed that facilitating therapy to patients is the main role of SLPs, even though they are aware of the wide range of roles that SLPs can assume.

Finally, it was found that the majority of SLPs are not aware of the wide range of treatment options available for aphasia. Although a majority of SLPs indicated familiarity with many of the treatment approaches listed, several of the treatment approaches earned

less than 60% of the responses. These results support the hypothesis that a majority percentage of SLPs with a Masters degree holding their CCCs are not completely aware of the wide range of therapy programs available for aphasia rehabilitation. Because aphasia is such a broad disorder, there exists a broad range of treatment approaches. Some treatments may focus on the symptoms resulting from aphasia, or on reintegrating patients into the community and providing them with life participation strategies. Even those who have taken aphasia courses at the graduate level and have participated in continuing education may not be fully aware of the variety of treatment options for aphasia.

After analyzing the results of the survey, the author's first hypothesis was rejected, and the second and third hypotheses were accepted. The first hypothesis stated that SLPs with their Masters degree and a Certificate of Clinical Competence do feel prepared to work with patients who have aphasia, even within varying age or type of aphasia. The survey results revealed that although a majority of SLP participants did feel prepared to work with patients who have aphasia, these results were not consistent across age and type of aphasia. A higher percentage of respondents indicated that they are more prepared to work with patients who are 50 and older, as compared to patients who are younger than 50. Also, many SLPs were unfamiliar several of the types of aphasia listed.

In contrast, the data supported the researcher's second hypothesis. This hypothesis stated that SLPs are familiar with all their roles and responsibilities when working with patients who have aphasia and feel that the most important role is to provide appropriate therapy to these patients. In question eight of the survey, a majority of participants indicated that each role listed is relevant to SLPs in aphasia rehabilitation. A majority of

SLPs also believed that the most important role of aphasia rehabilitation is facilitating therapy to patients, although as indicated by the results of question eight, it is not the only role that SLPs carry out.

The last hypothesis stated that a majority percentage of SLPs with a Masters degree and a Certificate of Clinical Competence are not completely aware of the wide range of therapy programs available for aphasia rehabilitation. The data support this hypothesis, as many of the treatment approaches listed did not receive a majority percentage of the responses. This indicates that most SLPs were not familiar with these approaches. Considering there are more treatment approaches than those listed in the survey, it can be concluded that SLPs are not completely aware of all the possible treatment programs available for aphasia. The implications of this research, including the rejection and acceptance of the three original hypotheses, will be discussed in the following chapter.

CHAPTER V

DISCUSSION

Summary

There are several roles that SLPs can have in aphasia rehabilitation. ASHA's policy document, *Roles of Speech-Language Pathologists in the Identification, Diagnosis, and Treatment of Individuals with Cognitive-Communication Disorders: Position Statement* (2005), explains that SLPs are responsible for identification, assessment, intervention, counseling, collaboration, case management, education, prevention, advocacy, and research in cognitive-communication disorders. More specifically, the ASHA document *Clinical Topics: Aphasia* (2014) list roles that fall under the previously listed categories for cognitive-communication disorders. These categories describe specific responsibilities of SLPs in aphasia rehabilitation. This specialized knowledge is important for SLPs who are providing services to patients with aphasia, as it is crucial that SLPs should be knowledgeable about the population they are working with (ASHA, 2014).

This study was designed to explore how prepared SLPs feel to work with people who have aphasia, how familiar they are with the wide range of roles and responsibilities they have within aphasia rehabilitation, and their awareness concerning the multitude of possible treatment options for patients of aphasia. Specifically the research hypotheses were:

1. SLPs with their Masters degree and a Certificate of Clinical Competence do feel prepared to work with patients who have aphasia, even within varying age or type of aphasia.

2. SLPs are familiar with all their roles and responsibilities when working with patients who have aphasia and feel that the most important role is to provide appropriate therapy to these patients.
3. A majority percentage of SLPs with a Masters degree and a Certificate of Clinical Competence are not completely aware of the wide range of therapy programs available for aphasia rehabilitation.

General Discussion

After analyzing the survey results, the researcher found that a majority of SLPs felt prepared to participate in aphasia rehabilitation upon receiving their CCC-SLP. However, the percentage of respondents who felt prepared to work in an aphasia center (76.9%) was lower than the percentage of respondents who had taken aphasia practice courses while in graduate school (84.5%). This provides evidence that some programs may not be educating their students thoroughly on the disorder of aphasia., or students may not be engaging in these courses. All graduate programs should aim to fully equip students and push them to gain the knowledge needed to work in any speech therapy setting with any population, including with aphasia patients.

SLPs did not report the same level of preparedness and familiarity across different age groups. Only 42% of respondents indicated that they felt prepared to work with patients 49 and younger. After reviewing this question, the researcher suggests that the question should have included answer choices designating children and younger adults. Participants answering this question should have had the ability to choose multiple answers in order for the respondents to indicate that they are prepared to work with more than just one age group, if applicable. This question was designed to support the

researchers hypothesis that SLPs are prepared to work with individuals who have aphasia, regardless of age. In changing the question slightly, the researcher would be able to support this hypothesis more accurately. SLPs also did not report the same level of preparedness when working with patients who have different types of aphasia. Less than 60% of the participants were familiar with transcortical sensory aphasia, primary progressive aphasia, transcortical motor aphasia, mixed transcortical aphasia, subcortical aphasia, and crossed aphasia. These results did not support the first hypothesis that SLPs with a masters-level degree and holding their CCCs feel prepared to work with patients who have aphasia, even across varying age groups and subtypes of aphasia.

It is possible that these results are due to the incidence of aphasia subtypes. Studies have found that Broca's, global, anomic and subcortical aphasia represented the majority of the subtypes that were identified (Hoffman & Ren, 2013). Although this does not correlate exactly with the findings in the current study, it can be used to explain the variation found in these responses. The incidence of aphasia subtypes affects how familiar the SLP is with specific types of aphasia. SLPs are more likely to be familiar with frequently occurring aphasias.

Although results did not support the first hypothesis, the survey responses did support the researcher's second hypothesis. This hypothesis stated that SLPs are familiar with their roles when working with people who have aphasia and believe that the most important role is to facilitate therapy to patients. Respondents indicated that they agreed with all the roles and responsibilities outlined by ASHA (2014). All of the roles were identified by more than 75% of the SLPs as responsibilities that should be a part of their practice in aphasia rehabilitation. Also 87% of SLP participants reported that facilitating

therapy to patients is the main role of an SLP in aphasia rehabilitation. However, SLPs are still aware that there is more than one single role of SLPs in aphasia, as indicated by the survey results.

It is possible that the high percentage of SLPs who are familiar with the roles and responsibilities could be related to the high percentage of participants who have been involved in education pertaining specifically to aphasia. Of SLPs surveyed, 84.5% indicated that they had participated in aphasia therapy practice courses within their graduate programs curriculum. Similarly, 80.8% of respondents reported that they had attended seminars, conferences, or continuing education courses in order to broaden their knowledge and skills concerning aphasia therapy. This demonstrates that SLPs are pursuing knowledge of aphasia in order to improve their skills as an SLP in the medical setting, and are interested in this specific population.

Although SLPs reported that facilitating therapy is the main role, as compared to consulting and collaborating with family members or caregivers, SLPs were still aware of the importance of this role. It was identified by 97% of SLPs that counseling and collaborating with family members and caregivers should be included in the responsibilities of SLPs when working with aphasia patients. Literature reviewed by the researcher provided much support for both administering therapy directly to the patients, and teaching families and caregivers how to support and encourage communication abilities in those with aphasia. An important part of aphasia rehabilitation is reengaging in society and daily life, and both of these roles enable people with aphasia to achieve a high level of normal functioning.

The third hypothesis stated by the research was also accepted based on the results of the suvey. Although SLPs were aware of a majority of the listed therapy techniques, the other six treatments listed were not familiar to a majority of particiapnts. There are many more treatment approaches than the ones listed on the survey in question fourteen. If a majority did not indicate familiarity with all the treatments listed by ASHA, then SLPs will most likely not be completely aware of the many other treatment approaches for aphasia.

Strengths and Limitations of Current Research

The current study has many strengths, particularly in the selection of participants and the gathering of data. Participants were chosen from across the country in order to avoid any geographic bias and surveys were sent to SLPs who have worked in several settings. Because the survey was anonymous, the researcher was not able to verify the location of each participant. However, because the survey was sent to SLPs in a broad range of locations, it is likely that respondents are from diverse areas of the country. The survey did not require that participants had experience treating patients with aphasia, but it did require that the respondents hold their CCC-SLP and have experience in a medical setting. Some participants may have worked extensively with patients who have aphasia, and others may have had little to no experience with aphasia rehabilitation. However, all participants have been certified by ASHA and earned a graduate degree in which they have been prepared to work in the field of speech-language pathology and should have some knowledge of aphasia. This selection of participants allowed the researcher to gauge how well graduate programs are preparing students in general for working with patients who have aphasia. Secondly, data were gathered electronically through Qualtrics

(2014), a survey software program. This program allowed participants to take the survey only once, reassuring that participants' responses were only counted once.

This study was a trial study and had many limitations. One weakness of this study was the small number of survey responses. More than 500 surveys were emailed to SLPs across the country, however this only yielded 105 responses. This study was designed not only to survey SLPs who work primarily with patients who have aphasia, but also SLPs who work in a range of medical settings across the country. Considering the intentions of this study, the sample size is small. The research was also limited by the data analysis. The author was unable to compare the data between questions. For example, the data did not show if those respondents who indicated that their graduate program's curriculum included any aphasia practice courses also indicated that they felt prepared for a possible career in an aphasia center when they received their graduate level degree.

Although this study had a small sample size and did not closely compare responses from the same respondents on multiple questions, the research questions were answered. This study offers information that can serve as the foundation for additional research on the SLPs role in aphasia rehabilitation, their preparedness to work with patients who have aphasia, their familiarity with their roles, and their awareness of treatment options.

Suggestions for Future Research

This study should be modified and expanded to receive more specific and reliable information about aphasia rehabilitation and the SLP's role. First, the study should increase the sample size in order to gather a larger number of responses. This would provide a more general idea of how familiar SLPs are with their roles in aphasia

rehabilitation, how prepared they feel to work with these patients, and their awareness of treatment options. Ideally responses would be received from SLPs practicing in every state in the United States.

Additionally, the study should provide more specific answer choices to the questions being asked. Several questions in the current study did not take into account that some participants may not have much or any interaction with people who have aphasia. The respondents should be provided with opportunities to explain their answers and should have more thorough answer choices so that participants have the ability to specifically answer questions.

Further studies on this topic should investigate the possible correlation between graduate-level education on aphasia and participants' familiarity with the topic of aphasia. In the current study, while 84.5% of participants claimed that their graduate curriculum included aphasia practice courses, only 76.9% indicated that they felt prepared for work in an aphasia center after receiving their graduate degree. Based on this information alone, the researcher cannot conclude that those who indicated having courses on aphasia are the same participants who felt prepared for working with patients who have aphasia. Exploring this relationship could help to improve graduate-level education on aphasia and help speech-language pathology students feel more prepared to work with this specialized population.

Conclusion

This thesis project was designed to explore the roles of speech-language pathologists in aphasia rehabilitation and their knowledge of these roles. Specifically, the researcher investigated how familiar SLPs are with their roles and responsibilities in this

area, how prepared they are to work with people who have aphasia, and how knowledgeable they are of the treatments available for aphasia therapy. The American Speech-Language-Hearing Association outlines these roles and responsibilities in two policy documents concerning cognitive-communication disorders, and a clinical topics page pertaining to aphasia. Based on this information from ASHA, an electronic survey was created and emailed to 519 SLPs. The survey questioned SLP participants on their familiarity with the roles and responsibilities, their preparedness to work in an aphasia setting after completing graduate school, and their knowledge of aphasia treatments.

After analyzing the results of the survey, the researcher found that a majority of the survey respondents felt prepared to participate in aphasia rehabilitation upon receiving their CCC-SLP. The participants were also familiar with a majority of the roles and responsibilities of SLPs in aphasia rehabilitation, as outlined by ASHA. All of the participants were familiar with the roles of developing treatment plans, and providing treatment to patients. Most participants were also familiar with assessing language and communication, and documenting progress. SLPs were least familiar with the role of providing prevention information. Finally, a majority of the SLPs surveyed were not aware of the broad range of treatment programs available for patients with aphasia.

Strengths of this study include the range of participants from different locations, protecting against geographic bias. Another strength is the range of experience that participating SLPs had with aphasia. These combined factors allowed the researcher to understand the general knowledge that SLPs as a whole have about aphasia. Shortcomings of this study include the small number of responses received and the

limited data analysis. In the future this study should include a larger number of participants and give participants the opportunity to give more comprehensive responses.

The information gained from this research can be applied to the education of SLPs and their practice in the medical setting. The study demonstrates that a majority of graduate programs do provide courses in aphasia as part of the curriculum, however this did not predict how prepared SLPs feel to work with patients who have aphasia. This implies that educational courses in graduate school should be more thorough and provide students with hands-on experiences to help them feel more prepared to begin work with people who have aphasia.

Within the medical setting, SLPs can use this research to realize the importance of continuing education programs. This study found that many SLPs are not familiar with several treatment programs that are outlined by ASHA as appropriate for people who have aphasia. It is important that SLPs are aware of the different methods to treating aphasia, and it is important for those who encounter the disorder to be continually seeking evidence-based practice and current research on the disorder. Also, the research will support the participation of SLPs when treating aphasia and other cognitive-communicative disorders. SLPs often work with professionals such as neurologists, occupational therapists, and physical therapists in the rehabilitation of neurogenic disorders. Collaboration between these disciplines is essential and SLPs must be aware of their roles and responsibilities to provide the patient with the appropriate treatment. Awareness of their roles is essential for the efficiency of an interdisciplinary team, and SLPs must be able to fulfill their own roles and responsibilities.

LIST OF REFERENCES

Adamovich, B.L.B. (2005). Traumatic brain injury. In L.L. LaPointe (Ed.), *Aphasia and related neurogenic language disorders* (225-226). New York, NY: Thieme Medical Publishers, Inc.

American Speech-Language-Hearing Association. (1988). *Prevention of communication disorders* [Position Statement]. Retrieved from www.asha.org/policy.

American Speech-Language-Hearing Association. (1990*). Interdisciplinary approaches to brain damage* [Position Statement]. Retrieved from www.asha.org/policy.

American Speech-Language-Hearing Association. (2003). *Rehabilitation of children and adults with cognitive-communication disorders after brain injury* [Technical Report]. Available from www.asha.org/policy.

American Speech-Language-Hearing Association. (2004). *Preferred Practice Patterns for the profession of speech-language pathology* [Preferred Practice Patterns]. Retrieved from www.asha.org/policy.

American Speech-Language-Hearing Association. (2005a). *Knowledge and skills needed by speech-language pathologists providing services to individuals with cognitive-communication disorders* [Knowledge and Skills]. Retrieved from www.asha.org/policy.

American Speech-Language-Hearing Association. (2005b). *Roles of speech-language pathologists in the identification, diagnosis, and treatment of individuals with cognitive-communication disorders: position statement* [Position Statement]. Retrieved from www.asha.org/policy.

American Speech-Language-Hearing Association. (2007a). *Appendix: Common classifications of aphasia.* Retrieved from http://www.asha.org/Practice-Portal/Clinical-Topics/Aphasia.

American Speech-Language-Hearing Association. (2007b). *Scope of practice in speech-language pathology* [Scope of Practice]. Retrieved from www.asha.org/policy.

American Speech-Language-Hearing Association. (2010). *Code of ethics* [Ethics]. Retrieved from www.asha.org/policy.

American Speech-Language-Hearing Association. (2011). *Speech-language pathology medical review guidelines.* Retrieved from www.asha.org/practice/reimbursement/SLP-medical-review-guidelines/.

American Speech-Language-Hearing Association. (2014). *Clinical topics: Aphasia.* Retrieved from http://www.asha.org/Practice-Portal/Clinical-Topics/aphasia/.

Avent, J., Glista, S., Wallace, S., Jackson, J., Nishioka, J., & Yip, W. (2005). Family information needs about aphasia. *Aphasiology, 19,* 365-375.

Avent, J., Patterson, J., Lu, A., & Small, K. (2009). Reciprocal scaffolding treatment: A person with aphasia as clinical teacher. *Aphasiology, 23* (1), 110-119.

Bakheit, A.M.O., Shaw, S., Carrington, S., & Griffiths, S. (2007). The rate and extent of improvement with therapy from the different types of aphasia in the first year after stroke. *Clinical Rehabilitation, 21* (10), 941-942.

Basso, A. (2003). *Aphasia and its therapy*. New York, NY: Oxford University Press Inc.

Basso, A.,Manes, F., Gleichgerrcht, E., & Macis, M. (2011). Therapy efficacy in chronic aphasia. *Behavioural Neurology, 24*, 317-325.

Beeson, P.M., Hirsch, F.M., & Rewega, M.A. (2002). Successful single-word writing treatment: Experimental analyses of four cases. *Aphasiology, 16* (4/5/6), 473-491.

Beeson, P.M., Higginson, K., & Rising, K. (2013). Writing treatment for aphasia: A texting approach. *Journal of Speech, Language, and Hearing Research, 56* (3), 945-955.

Berndt, R.S., Mitchum, C.C., & Haendiges, A.N. (1996). Comprehension of reversible sentences in "agrammatism": A meta-analysis. *Cognition, 58* (3), 289-308.

Berthier, M.L. (1999). *Transcortical aphasias.* East Sussex, UK: Psychology Press.

Byng, S., Pound, C., & Parr, S. (2000). Living with aphasia: A framework for therapy interventions. In I. Papathanasiou (Ed.), *Acquired neurogenic communication disorders: A clinical perspective* (49-75). Philadelphia, PA: Whurr Publishers Ltd.

Cameron, V. (2013). Best practices for stroke patient and family education in the acute care setting: A literature review. *Medsurg Nursing, 22* (1), 51-55.

Chapey, R., Duchan, J.F., Elman, R.J., Garcia, L.J., Kagan, A., Lyon, J., & Simmons-Mackie, N. (2000). Life participation approach to aphasia: A statement of values for the future. *The ASHA Leader, 5* (3), 4-6.

Caspari, I. (2005). Wernicke's aphasia. In L.L. LaPointe (Ed.), *Aphasia and related neurogenic language disorders, third edition* (142-154). New York, NY: Thieme Medical Publishers, Inc.

Cauquil-Michon, C., Flamand-Roze, C., & Denier, C. (2011). Borderzone strokes and transcortical aphasia. *Current Neurology and Neuroscience Reports, 11* (6), 570-577.

Chatterjee, A., & Maher, L. (2000). Grammar and agrammatism. In S.E. Nadeau, L.J.G. Rothi, & B. Crosson (Eds.), *Aphasia and language: Theory to practice* (133-156). New York, NY: The Guilford Press.

Cherney, L.R. (2010). Oral reading for language in aphasia: Impact of aphasia severity on cross-modal outcomes in chronic nonfluent aphasia. *Seminars in speech and languge, 31* (1), 42-51.

Code, C., & Petheram, B. (2011). Delivering for aphasia. *International Journal of Speech-Language Pathology, 13* (1), 3-10.

Collins, M. (2005). Global aphasia. In L.L. LaPointe (Ed.), *Aphasia and related neurogenic language disorders, third edition* (186-198). New York, NY: Thieme Medical Publishers, Inc.

Coordinating Committee of the Vice President for Speech-Language Pathology Practice. (2009). Role ambiguity and speech-language pathology. *The ASHA Leader, 14* (16), 12-15.

Coppens, P., & Hungerford, S. (1998). Crossed aphasia. In P. Coppens, Y. Lebrun, & A. Basso, (Eds.), *Aphasia in atypical populations* (203-260). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Dalemans, R., Wade, D.T., Van den Heuvel, W.J.A., & De Witte, L.P. (2009). Facilitating the participation of people with aphasia in research: A description of strategies. *Clinical Rehabilitation, 23,* 948-959.

DeRuyter, F., Fromm, D.S., Holland, A.L., Stein, M. (1996). Treatment efficacy: Aphasia. *Journal of Speech and Hearing Research, 39*, 527-536.

Donnelly, E., & King, M. (2014). Treating stroke in the acute setting. *Rehab Management: The Interdisciplinary Journal of Rehabilitation, 27* (2), 40-44.

Drummond, S.S. (2006). *Neurogenic communication disorders: Aphasia and cognitive communication disorders.* Springfield, IL: Charles C. Thomas, Publisher, LTD.

Eadie, T.L., Yorkston, K.M., Klasner, E.R., Dudgeon, B.J., Deitz, J.C., Baylor, C.R., …Amtmann, D. (2006). Measuring communicative participation: A review of self-report instruments in speech-language pathology. *American Journal of Speech-Language Pathology, 15* (4), 307-320.

Edmonds, L.A., Nadeau, S.E., & Kiran, S. (2009). Effect of verb network strengthening treatment (VNeST) on lexical retrieval of content words in sentences in persons with aphasia. *Aphasiology, 23* (3), 402-424.

Edwards, S. (2005). *Fluent aphasia.* New York, NY: Cambridge University Press, New York.

Elbaum, J., & Benson, D.M. (2007). *Acquired brain injury: An integrative neuro-rehabilitation approach*. New York, NY: Springer.

Elman, R.J., Ogar, J. & Elman, S.H. (2000). Aphasia: Awareness, advocacy, and activism. *Aphasiology, 14* (5/6), 455-459.

Finch, E., Fleming, J., Brown, K., Lethlean, J., Cameron, A., & McPhail, S.M. (2013). The confidence of speech-language pathology students regarding communicating with people with aphasia. *BMC Medical Education, 13,* 92.

Goldberg, S., Haley, K.L., & Jacks, A. (2012). Script training and generalization for people with aphasia. *American Journal of Speech-Language Pathology, 21*, 222-238.

Goodglass, H., & Kaplan, E. (1983). *The assessment of aphasia and related disorders.* Philadelphia, PA: Lea and Febiger.

Goodglass, H. (1993). *Understanding aphasia.* San Diego, CA: Academic Press, Inc.

Hartman, D.E., & Goodsett, M. (2003). A case of crossed aphasia. *Gundersen Lutheran Medical Journal,* 2 (1), 43-46.

Helm-Estabrooks, N., Fitzpatrick, P.M., & Barresi, B. (1982). Visual action therapy for global aphasia. *Journal of Speech and Hearing Disorders, 47*, 385-389.

Herrero, M.T., Barcia, C., & Navarro, J.M. (2002). Functional anatomy of thalamus and basal ganglia. *Child's Nervous System,* 18 (8), 386-404.

Hillis, A.E. (2007). Aphasia: Progress in the last quarter of a century. *Neurology, 69* (2), 200-213.

Holland, A.L. (2007). Counseling families and adults with speech and language disorders: The view from a wellness perspective. In M.J. Ball, & J.S. Damico, (Eds.), *Clinical aphasiology* (213-221). New York, NY: Psychology Press.

Holland, A.L. (2008). Concentrating on the consequences. In N. Martin, C.K. Thompson, & L. Worrall (Eds.), *Aphasia rehabilitation: The impairment and its consequences* (45-62). San Diego, CA: Plural Publishing, Inc.

Hollingsworth, A.L., Rothi, L.J.G., & Cimino-Knight, A.M. (2005) The transcortical aphasias. In L.L. LaPoine (Ed), *Aphasia and related neurogenic language disorders, third edition* (169-185). New York, NY: Thieme Medical Publishers, Inc.

Insalaco, D., Ozkurt, E., & Santiago, D. (2007). The perceptions of students in the allied health professions towards stroke rehabilitation teams and the SLP's role. *Journal of Communication Disorders, 40*, 196-214.

Joint Committee on Interprofessional Relations Between the American Speech-Language-Hearing Association and Division 40 (Clinical Neuropsychology) of the American Psychological Association. (2007). *Structure and function of an interdisciplinary team for persons with acquired brain injury*. Retrieved from www.asha.org/policy.

Kearns, K.P. (2005). Broca's aphasia. In L.L. LaPointe, (Ed.), *Aphasia and related neurogenic language disorders, third edition* (117-141). New York, NY: Thieme Medical Publishers, Inc.

Kim, M., & Russo, S. (2010). Multiple oral reading (MOR) treatment: Who is it for? *Contemporary Issues in Communications Science & Disorders,* 37, 58-68.

King, J.M., Alarcon, N.B., & Rogers, M.A. (2000). Proactive management of primary progressive aphasia. In D.R. Beukelman, K.M. Yorkston, & J. Reichle (Eds.), *Augmentative and alternative communication for adults with acquired neurologic disorders* (305-338). Baltimore, MD: Paul H. Brookes Publishing Co.

King, J.M., Alarcon, N., & Rogers, M.A. (2007). Primary progressive aphasia. In D.R. Beukelman, K.L. Garrett, & K.M. Yorkston (Eds.), *Augmentative communication strategies: For adults with acute or chronic medical conditions* (207-242). Baltimore, MD: Paul H. Brookes Publishing Co., Inc.

LaPointe, L.L. (2005). Foundations: Adaptation, accommodation, *aristos.* In L.L. LaPointe (Ed.), *Aphasia and related neurogenic language disorders* (1-18). New York, NY: Thieme Medical Publishers, Inc.

Links, P., Hurkmans, J., & Bastiaanse, R. (2010). Training verb and sentence production in agrammatic Broca's aphasia. *Aphasiology, 24* (11), 1303-1325.

McNeil, M.R., & Pratt, S.R. (2001). Defining aphasia: Some theoretical and clinical implications of operating from a formal definition. *Aphasiology, 15* (10/11), 901-911.

Mesulam, M.M. (2003). Primary progressive aphasia: A languge-based dementia. *New England Journal of Medicine, 349* (16), 1535-1542.

National Aphasia Association. (2011). *Aphasia FAQ.* Retrieved from http://www.aphasia.org/?q=content/aphasia-faq.

National Institute of Deafness and other Communication Disorders. (2008). *NIDCD fact sheet: Aphasia.* Retrieved from http://www.nidcd.nih.gov/health/voice/pages/aphasia.

National Institute of Neurological Disorders and Stroke. (2014). *NINDS aphasia information page.* Retrieved from http://www.ninds.nih.gov/disorders/aphasia/aphasia.htm.

Pashek, G.V. (1997). A case study of gesturally cued naming in aphasia: Dominant versus nondominant hand training. *Journal of Communication Disorders, 30* (5), 349-366.

Qualtrics [survey software]. (2014). Retrieved from http://www.qualtrics.com.

Pulvermuller, F., & Berthier, M.L. (2008). Aphasia therapy on a neuroscience basis. *Aphasiology, 22* (6), 563-599.

Raymer, A. (2009). Constraint-induced language therapy: A systematic review. *The ASHA Leader, 14* (2), 26-27.

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

Rosa, P.A.D, Canini, M., Borsa, V.M., Marien, P., Cappa, S.F., & Abutalebi, J. (2014). Functional recovery in subcortical crossed and standard aphasia. *Journal of Neurolinguistics, 27* (1), 103-118.

Rose, T.A., Worrall, L.E., McKenna, Hickson, L.M. & Hoffman, T.C. (2009). Do people with aphasia receive written stroke and aphasia information? *Aphasiology, 23* (3), 364-392.

Sander, A. M., Raymer, A., Wertheimer, J., & Paul, D. (2009). Perceived roles and collaboration between neuropsychologists and speech-language pathologists in rehabilitation. *The Clinical Neuropsychologist, 23* (7), 1196-1212.

Sarno, M.T. (1993). Aphasia rehabilitation: Psychosocial and ethical considerations. *Aphasiology, 7,* 321-334.

Sarno, M.T. (2004). Aphasia therapies: Historical perspectives and moral imperatives. In J.F. Duchan & S. Byng (Eds.), *Challenging aphasia therapies: Broadening the discourse and extending the boundaries* (19-31). New York, NY: Psychology Press.

Sheratt, S. (2011). Written media coverage of aphasia: A review. *Aphasiology, 25* (10), 1132-1152.

Simmons-Mackie, N. (2005). Conduction aphasia. In L.L. LaPointe (Ed.), *Aphasia and related neurogenic language disorders* (155-164). New York, NY: Thieme Medical Publishers, Inc.

Simmons-Mackie, N., & Lynch, K.E. (2013). Qualitative research in aphasia: A review of the literature. *Aphasiology, 27* (11), 1281-1301.

Skeat, J., & Perry, A. (2008). Grounded theory as a method for research in speech and language therapy. *International Journal of Language and Communication Disorders, 43* (2), 95- 108.

Spreen, O., & Risser, A.H. (2003). *Assessment of aphasia.* New York, NY: Oxford University Press, Inc.

Strasser, D.C., Falconer, J.A., Stevens, A.B., Uomoto, J.M., Herrin, J., Bowen, S.E., & Burridge, A.B. (2008). Team training and stroke rehabilitation outcomes: A cluster randomized trial. *Archives of Physical Medicine and Rehabilitation, 89* (1), 10-15.

Tesak, J., & Code, C. (2008). *Milestones in the history of aphasia: Theories and protagonists.* East Sussex, UK: Psychology Press.

Thompson, C.K., & Shapiro, L.P. (2005). Treating agrammatic aphasia within a linguistic framework: Treatment of underlying forms. *Aphasiology, 19* (10/11), 1021-1036.

Toner, M.A., & Shadden, B.B. (2002). Counseling challenges: Working with older clients and caregivers. *Contemporary Issues in Communication Sciences and Disorders, 29,* 68-78.

Turner, S., & Whitworth, A. (2006). Conversational partner training programmes in aphasia: A review of key themes and participants' roles. *Aphasiology, 20* (6), 483-510.

Webb, W.G. (2005). Acquired dyslexias: Reading disorders associated with aphasia. In L.L. LaPointe (Ed.), *Aphasia and related neurogenic language disorders, third edition* (83-96). New York, NY: Thieme Medical Publishers, Inc.

Wilson, B.A., & Moffat, N. (1984). *Clinical management of memory problems.* Rockville, MD: Aspen Systems Corporation.

Wright, H.H. & Newhoff, M. (2005). Pragmatics. In L.L. LaPointe (Ed.), *Aphasia and related neurogenic language disorders, third edition* (237-248). New York, NY: Thieme Medical Publishers, Inc.

Wright, L., Hill, K.M., Bernhardt, J., Lindley, R., Ada, L., Bajorek, B.V.,… Nelson, M.R. (2012). Stroke management: Updated recommendations for treatment along the care continuum. *Internal Medicine Journal 42,* 562-569.

Zimmerer, V.C., Cowell, P.E., & Varley, R.A. (2014). Artificial grammar learning in individuals with severe aphasia. *Neuropsychologia, 53*, 25-38.

APPENDICES

APPENDIX A

LETTER TO PARTICIPANTS

Dear Speech-Language Pathologist,

My name is Meredith Wooley and I am a senior at the University of Mississippi studying Communication Sciences and Disorders. I am currently conducting a research project to fulfill the graduation requirements for the Sally McDonnell-Barksdale Honors College. I have chosen to research the roles and responsibilities of speech-language pathologists (SLPs) regarding aphasia rehabilitation and therapy. SLPs play a huge part in the success of aphasia rehabilitation, as they aid patients and their families in processing and recovering from this communication impairment. This study will explore SLPs awareness of their roles within aphasia rehabilitation as well as their preparedness to work with patients suffering from aphasia.

Included in this email is a link to a survey that I would appreciate if you could take the time to complete. The survey is internet-based, consists of 17 questions, and will take no more than ten minutes of your time. Your answers will be kept confidential. You are eligible to participate in this survey if you hold the CCC-SLP with at least one year of experience in a medical setting after completing your CFY. **Your response to this survey is valuable even if you have no experience with people with aphasia.** If you would like a copy of the results, please enter your email address in the blank provided at the end of the survey.

By completing this survey, you are agreeing to have your responses collected as data and used in this study. However, none of your personal, identifiable information will

be released. In addition, the data collected in this study will be destroyed one year following completion of the study.

This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). The IRB has determined that this study fulfills the human research subject protections obligations required by state and federal law and University policies. If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the IRB at (662) 915-7482.

Research on SLPs' knowledge about their roles in aphasia rehabilitation is important for understanding how future SLPs can be successfully trained to serve this specialized population. Thank you once again for taking the time to complete this survey. If you know of other SLPs who are eligible to participate in this survey, please forward this message on to them.

Sincerely,

Meredith Wooley
Undergraduate Honors Student
University of Mississippi
mawooley@go.olemiss.edu
(214)-862-8883

APPENDIX B
IRB APPROVAL LETTER

THE UNIVERSITY OF MISSISSIPPI

Meredith Wooley <mawooley@go.olemiss.edu>

IRB Approval of 14x-056

Ole Miss IRB <irb@olemiss.edu> Tue, Oct 1, 2013 at 10:41 AM
To: Meredith Wooley <mawooley@go.olemiss.edu>, rledge@go.olemiss.edu
Cc: livy@go.olemiss.edu

Ms. Wooley:

This is to inform you that your application to conduct research with human participants, “Speech-Language Pathologists in Aphasia Therapy and Rehabilitation" (Protocol #14x-056), has been approved as Exempt under 45 CFR 46.101(b)(#2).

Please remember that all of The University of Mississippi’s human participant research activities, regardless of whether the research is subject to federal regulations, must be guided by the ethical principles in The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research.

It is especially important for you to keep these points in mind:

- You must protect the rights and welfare of human research participants.
- Any changes to your approved protocol must be reviewed and approved before initiating those changes.
- You must report promptly to the IRB any injuries or other unanticipated problems involving risks to participants or others.

If you have any questions, please feel free to contact the IRB at irb@olemiss.edu.

Jennifer Caldwell, PhD
Senior Research Compliance Specialist, Research Integrity and Compliance
The University of Mississippi
212 Barr
University, MS 38677-1848
U.S.A.
+1-662-915-5006
irb@olemiss.edu | www.olemiss.edu

APPENDIX C

SURVEY

1. Did your graduate program's curriculum include any aphasia therapy practice courses?
    a. Yes
    b. No
2. Did you feel prepared for a possible career in an aphasia center when you received your graduate level degree?
    a. Yes
    b. No
3. Which population do you feel that you are more prepared to work with
    a. Patients 50 and older
    b. Patients 49 and younger
4. How often do you see patients who have aphasia?
    a. Once a year
    b. A few times a year
    c. Once a month
    d. A few times a month
    e. Every week
5. Based on your experience please identify ALL of the forms of aphasia that you are familiar with
    a. Global aphasia
    b. Broca's aphasia (non-fluent aphasia)
    c. Conduction aphasia
    d. Wernicke's aphasia (fluent aphasia)
    e. Anomic aphasia
    f. Transcortical sensory aphasia
    g. Transcortical motor aphasia
    h. Mixed transcortical aphasia
    i. Crossed aphasia
    j. Subcortical aphasia (ppA)

k. Primary progressive aphasia

6. How many patients with aphasia have you worked with?
    a. 1-5
    b. 5-10
    c. 10-20
    d. more than 20
7. Of the patients with aphasia that you have worked with, for most, their onset of aphasia was a result of:
    a. Stroke
    b. Traumatic brain injury
    c. Brain tumor
8. Based on your knowledge please identify ALL of the roles and responsibilities that you think should be included in the SLPs roles and responsibilities in aphasia treatment
    a. Providing prevention information
    b. Educating other professionals
    c. Screening
    d. Determining the need for further assessment and/or referral for other services
    e. Assessing language and communication
    f. Diagnosing the presence or absence of aphasia
    g. Referring to other professionals
    h. Developing treatment plans
    i. Providing treatment
    j. Documenting progress
    k. Determining appropriate dismissal criteria
    l. Counseling persons with aphasia and their families
    m. Consulting and collaborating with other professionals
    n. Consulting and collaborating with family members or caregivers
    o. Remaining informed of research in the area of aphasia
    p. Helping advance the knowledge of aphasia treatment

q. Advocating for individuals with aphasia and their families

9. In your opinion what should be the main role of an SLP in aphasia rehabilitation?
    a. To facilitate therapy to patients
    b. To consult and collaborate with family members or caregivers
10. Have you attended or participated in any seminars, conferences, or continuing education courses after graduate school, in order to broaden your knowledge and skills concerning aphasia therapy?
    a. Yes
    b. No
11. Do you feel confident you could conduct a comprehensive assessment of a patient suspected to have aphasia?
    a. Yes
    b. No
12. Do you participate in public education and advocacy for those suffering with aphasia?
    a. Yes
    b. No
13. Are you knowledgeable on how to train families to effectively communicate with persons who have aphasia?
    a. Yes
    b. No
14. Please identify ALL of the following treatment options that you are familiar with
    a. Language-impairment based treatment
    b. Computer-based treatment
    c. Constraint Induced Language Therapy (CILT)
    d. Melodic Intonation Therapy (MIT)
    e. Reading treatment
    f. Syntax treatment
    g. Treatment of underlying forms
    h. Verb Network Strengthening Treatment
    i. Word finding treatment

j. Writing treatment
k. Multimodal treatment
l. Partner approaches
m. Pragmatic treatment
n. Reciprocal scaffolding
o. Script training

15. Have you seen noticeable improvements in people with aphasia as a result of these treatments?
    a. Yes
    b. No
16. What year did you receive your CCC-SLP?

    _____
17. If you would like a copy of the results, please enter your email address.

_____