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Self-Awareness And Therapeutic Alliance In The Treatment Of Traumatic Brain Injury

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SELF-AWARENESS AND THERAPEUTIC ALLIANCE IN THE TREATMENT OF TRAUMATIC BRAIN INJURY

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CHAPTER 1: INTRODUCTION

Background

Awareness and therapeutic alliance are key elements to successful cognitive-communicative rehabilitation after traumatic brain injury (TBI), yet the interaction between these concepts as it relates to TBI treatment is rarely discussed within the field of speech-language pathology. Each element has particular relevance for the speech-language pathologist (SLP) providing cognitive-communicative rehabilitation. Self-awareness, therapeutic alliance, principles of cognitive-communication, and the issues surrounding these concepts relative to the provision of TBI treatment, will be described in this paper.

Self-awareness is operationally defined in this paper as a concept encompassing the recognition of changes in one's self or abilities, and the ability to evaluate one's current abilities and their consequent implications on life activities (Lloyd, Ownsworth, Fleming, & Zimmer-Gembeck, 2015; Llorens, Noe, Ferri, & Alcaniz, 2015). Therapeutic alliance is operationally defined here as an umbrella term referring to the interpersonal processes taking place during therapeutic treatment; and TBI as damage to cortical or subcortical structures and/or disruption of neurotransmitter systems that results in some degree of cognitive, physical, or behavioral/emotional impairment, following a blow to the head.

Deficits in awareness commonly occur after TBI (Curtiss, Belanger, & Duchnick, 2007; Lloyd et al., 2015; Llorens et al., 2015). There is an estimated incidence of 1.7 million traumatic brain injuries annually, with approximately 275,000 of that number requiring hospitalization or intensive rehabilitation (Faul, Xu, Wald, & Coronado, 2010). Of these TBIs, there is an estimated prevalence of impaired awareness at 45% (Flashman & McAllister, 2002). Impaired self-awareness after TBI has been inconsistently associated with injury severity (Dirette & Plaiser,

2007), but consistently and significantly associated with time post-injury (Curtiss, 2007, Kelley et al., 2014). Impaired self-awareness after TBI can negatively influence an individual's receptivity to compensatory strategies and overall participation in rehabilitation after TBI (Ownsworth & Clare, 2006), and negatively correlates with poor functional outcomes after rehabilitation (McDonald et al., 2012; Prigatano, 2009). Impaired self-awareness after TBI can cause significant difficulty with reintegration into pre-injury social, familial, and vocational roles (Robertson & Schmitter-Edgecombe, 2015; McDonald et al., 2012; Gracey, Evans, & Malley, 2009; Kelley et al., 2014) and has been associated with decreased interpersonal competence, safety, and independence at home and in the workplace (Klimoski & Xiaoxiao, 2011; Lloyd et al., 2015).

Therapeutic alliance is a necessary component to achieving collaboration and successful treatment outcomes (Castonguay, & Beutler, 2006; Toglia & Kirk, 2000). The interpersonal processes at work during the development and maintenance of therapeutic alliance occur both independently and laterally to specific treatment tasks (Elvins & Green, 2008). In studies of this topic, a positive working relationship between the client and clinician is unanimously, and significantly, linked to successful therapy outcomes (Cailhol et al., 2009; Ebert and Kohnert, 2010; Schönberger, Humle, Zeeman, & Teasdale, 2006), even when factoring in moderating variables such as the type of outcome measure used, the type of treatment provided, or the profession rating outcomes and alliance (Martin, Garske, & Davis, 2000).

Statement of the Problem

The problem highlighted in this paper is two-fold. First, although both self-awareness and therapeutic alliance have been independently associated with treatment outcomes after TBI, there is a paucity of research, particularly within the field of speech-language pathology, which has examined the relationship between these concepts. Second, there remains a paucity of SLP-driven

information on treating awareness deficits. The importance of self-awareness has been highlighted in major literature reviews and clinical practice guidelines on TBI rehabilitation, due to the direct application of awareness to intervention outcomes across multiple speech, language, and cognitive-communicative domains (American Speech-Language-Hearing Association [ASHA], n.d.; Tate et al., 2014; McDonald et al., 2012; Kleim & Jones, 2008; Fleming & Ownsworth, 2006). However, rehabilitation techniques for treating awareness after TBI are rarely described in the research literature, and those that are described are often embedded within broader rehabilitation programs (Fleming & Ownsworth, 2006).

Significance of the Study

Issues surrounding self-awareness and therapeutic alliance in the speech-language treatment of cognitive-communicative disorders after TBI are explored in this study. An understanding of (a) the issues surrounding impaired awareness; (b) the importance of therapeutic alliance; (c) principles of TBI rehabilitation; and (d) the interaction between each of these elements relative to treatment of TBI has significant clinical ramifications for SLPs providing cognitive-communicative rehabilitation for TBI clientele.

Purpose of the Study

The purpose of this study is to examine the relationship between self-awareness and therapeutic alliance in dyads of SLPs and clients with brain injury during a collaborative therapy task. The findings of this study are compared to the existing literature on these topics and discussed with respect to their theoretical implications for clinical practice and overall knowledge in the field of speech-language pathology.

CHAPTER 2: LITERATURE REVIEW

Defining Terms

Research on treating awareness deficits is fraught with terminological and methodological inconsistencies, making a discussion of awareness or its components difficult across the health and educational disciplines (Abreu et al., 2001). Many terms have been used to describe concepts of self-awareness, for example: insight, denial, anosognosia, metacognition, self-knowledge, self-evaluative accuracy, self-consciousness, and self-appraisals. The distinctions that are made among these terms often reflect only negligible differences in meaning or describe a specific component of behavior thought to be inherent to self-awareness. A brief summary of key definitions can provide clarity for this discussion.

First, "insight": a term that has been used interchangeably with awareness, as a conceptual framework for awareness, or as a means of problem-solving. Marková and Berrios (2011) contended that the term "awareness" is actually a narrow, sharply focused aspect of insight dealing with a person's neurological or neuropsychological recognition of loss of function, whereas "insight" is a broader term that should be used to refer to the "sense", or judgments, that an individual makes of a disorder after he has gained awareness of it. In contrast, Fleming (2010) used insight interchangeably with the term self-awareness, defining both as the ability to acknowledge strengths, deficits, and implications of these deficits on functional performance. Eysenck and Keane (2015) had quite a different explanation of insight that moved away from the concept of awareness entirely; they defined insight as "the experience of suddenly realizing how to solve a problem" (p. 507).

The term "denial" has been used to refer to the behavioral manifestation of a psychologically-based defense mechanism protecting the brain against harsh reality (Fleming,

2010). The implications of some studies are that deficits in self-awareness can serve a protective function against the emotional backlash that comes with recognizing unwanted changes to self-image (Naylor & Clare, 2008). However, the state or phase of denial and related awareness deficits demonstrated in individuals with brain injury are rooted in neurology, not psychology. In contrast to denial, Hoerold, Pender, & Robertson (2013) described impaired self-awareness after brain injury as a multifaceted neuropsychological problem rather than a singular psychiatric condition.

The term "anosognosia" is typically used to refer to a severe impairment in awareness resulting from acquired brain injury and most often to describe the denial or neglect of physical impairments (e.g. hemiplegia; Adair & Barrett, 2012). Gasquoine (2016) operationally defined anosognosia as the underreport ("including failure to report, minimization of severity, or underestimation of adverse functional consequences" [p. 263]) of symptoms. While it would be technically correct to refer to general deficits in self-awareness after TBI as "anosognosia" (e.g. Prigatano, 2009), the preferred term to describe deficits in self-awareness affecting multiple domains (communicative, behavioral, emotional, cognitive; Bach & David [2006]), and the term used in the vast majority of studies examining a TBI population, is "impaired self-awareness," rather than anosognosia. Some authors suggest that both neglect and anosognosia are actually disorders of attention specifically related to body schema (Fleming, 2010).

The final term which bears explanation is "metacognition." Metacognition, simply explained as "knowing about knowing" (Ben-Yishay & Diller, 1993, p. 208), has been discussed as (a) a framework for the construct of self-awareness, (b) an interchangeable concept with self-awareness, and (c) a specific component of awareness. To the foremost definition, Dunlosky and Metcalfe (2009) suggested that metacognition involves two components; awareness and control, which refer to the monitoring of and adjusting of thoughts, respectively (Casselman & Atwood,

2017). Alternatively, Fleming (2010) and Hoerold and colleagues (2013) specified metacognition and self-awareness as interchangeable cognitive processes with small distinctions; the former term involving an individual's awareness of his own cognitive functioning with the latter term reflecting the ability to integrate knowledge of inner experience and external reality. However, Bach and David (2006) argued against using metacognition and awareness interchangeably, suggesting that the term self-awareness is more accurately applied across multiple domains and that only the term metacognition, not self-awareness, should be used in discussions of cognition or executive function. Finally, Crosson and colleagues (1989) described metacognition as an aspect of awareness that deals with a person's overall knowledge of deficits in any domain.

Neural Correlates

In most studies of awareness (including those examining insight, anosognosia, and metacognition), awareness has been linked to neural networks in the frontal lobe. Schmitz, Rowley, Kawahara, and Johnson (2006) related self-awareness to neural networks of the right dorsal and medial prefrontal cortices. Hoerold and colleagues (2013) correlated impaired metacognitive awareness with frontal lesions regardless of laterality, and linked impaired emergent awareness with lesions to the right prefrontal cortex rather than the left.

The neural basis of awareness is understood further through studies of brain damage. O'Keefe and colleagues (2007b) proposed that any focal or singular lesion weakening an individual's inhibitory motor control, interference control, and/or cognitive flexibility likely disrupts the frontal-subcortical pathways required for metacognitive and anticipatory awareness, and thus can have cascading effects that decrease awareness for cognitive and social functions. The frontal lobe is often identified as the seat of metacognitive awareness, which would make this aspect of awareness particularly vulnerable after traumatic brain injury (Fleming, 2010).

McDonald, Flashman, and Saykin (2002) noted that structural damage following TBI is typically caused by neuronal shearing, diffuse axonal injury, and white matter atrophy in specific regions or pathways. Damage to the frontal-subcortical pathways can also disrupt neurotransmitter systems such as noradrenergic projections and catecholaminergic cell groups (McDonald et al., 2002). Significant reductions in gray and white matter volumes have been indicated in neuroimaging studies of individuals with TBI compared to healthy controls (Brezova et al., 2014; Livny et al., 2016).

Overall deficits in self-awareness after TBI have been related to breakdowns of interacting pathways within the frontal-parietal control network, including regions and structures like the dorsal anterior cingulate cortex, anterior insulae, right middle frontal gyrus, and the dorsal striatum (Ham et al., 2014). Traumatic brain injury can impact awareness even without overt lesions to the frontal lobe, as connections between brain regions are susceptible to diffuse axonal injury during a traumatic brain event (Arnould, Dromer, Rochat, Van der Linden, & Azouvi, 2016).

Both TBI and Alzheimer's may cause dysfunction of the frontal systems resulting in disrupted conscious self-awareness (Hoerold et al., 2013); impaired self-awareness in individuals with Alzheimer's also has been linked to decreased neural activity in the anterior cingulate cortex (Amanzio et al., 2013). Anosognosia after stroke usually is attributed to lesions in the right hemisphere and focal to the frontal and prefrontal regions (Adair & Barrett, 2012), with more specific regions including the insular cortex and the right parietal lobe (Gasquione, 2016). Decreased metabolic activity in several brain regions (e.g. the right parahippocampal, the mesial prefrontal lobe, the posterior cingulate gyrus, the right frontal lobe, and the orbital-frontal cortex) also has been significantly associated with impaired self-awareness in brain-injured populations (e.g. mild cognitive impairment, dementia, Alzheimer's, and TBI; [Prigatano, 2009]). Reduced

gray matter density in ventral and rostral prefrontal areas, specifically in the subgenual cingulate, is associated with deteriorated self-appraisal skills in individuals with behavioral-variant frontotemporal degeneration (bvFTD) and Alzheimer's disease (Massimo et al., 2013).

Theoretical Models

Three main psychobiological hypotheses of awareness have been advanced to explain its relationship to other cognitive and communicative skills. First, awareness can be viewed as a unique function of executive control. In this approach, there is an overarching executive control system that regulates metacognition and behavior, and impaired self-awareness is indicative of a disrupted executive control system (Amanzio et al., 2013). Specifically, it is one of many functions involved in self-regulation and can be partitioned out from other executive skills and impaired in isolation (Kennedy & Coelho, 2005; Stuss & Benson, 1986). This approach is often taken in the field of neuropsychology. However, executive models of self-awareness are not always supported in empirical findings, and some authors suggest that the seeming reliance of awareness on executive functioning is explained by the overlapping neural pathways in the frontal lobe (i.e. prefrontal regions) supporting each construct (McDonald et al., 2002; Lehtonen et al., 2000). While there is evidence supporting an association between awareness and executive function (as described under the third hypothesis, cited below), there is little evidence that executive function regulates awareness (Bach & David, 2006).

Second, awareness can be viewed as an overarching cognitive system that globally impacts and orchestrates other domains (Hoerold et al., 2013). This view could explain how individuals within a heterogeneous TBI population almost universally exhibit impaired self-awareness; the broad neural networks associated with awareness are vulnerable to the diffuse axonal injury often reported in TBI. This view is often cited in cognitive psychology and is supported by treatment

studies that demonstrate how improving awareness deficits results in improved responsivity to rehabilitation without achieving domain (i.e. physical, communicative, cognitive) or task specific gains (Goverover, Johnston, Toglia, & Deluca, 2007). This view is also supported by results from O'Keefe and colleagues (2007b), who found that individuals with progressive brain disease showed equally pervasive awareness deficits across domains irrespective of the object of awareness (e.g. motor, thinking, memory, language). The implications of these results were that 1) awareness is a construct overarching all domains and is not domain specific, and 2) common neural pathways support the construct of awareness across all functional systems.

Finally, awareness has been theorized as a global construct (O'Keefe et al., 2007c) that is also modular and skill specific (Marcel, Tegnér, & Nimmo-Smith, 2004; Prigatano, Matthes, Hill, Wolfe, & Heiserman, 2011; Ownsworth, Clare, & Morris, 2006; Toglia & Kirk, 2000) and that is thought to be distinct from, yet acting in concert with, cognition. In this view of self-awareness, a person can have different degrees of awareness for various cognitive skills as well as across behavioral, physical, emotional, and cognitive domains as a whole (Lloyd et al., 2015; Hart, Sherer, Whyte, Polansky, & Novack, 2004). This theory is supported by dissociations between subtypes of awareness; for example, Prigatano and colleagues (2011) found that awareness of cortical blindness could be dissociated from anosognosia for hemiplegia. Additional support for a modular view comes from research in which significant relationships between awareness and various other skills are identified; for example, awareness and executive functioning (Ciurli et al., 2010; Bergquist & Jackets, 1993; Bogod, Mateer, & MacDonald, 2003), behavior (Bach & David, 2006; Malec & Moessner, 2000), affect and motivation (Bailey et al., 2015; Fleming, 2010), attention (Dockree, Tarleton, Carton, & FitzGerald, 2015), memory (Lloyd et al., 2015), social and

vocational outcomes (Llorens et al., 2015; Ownsworth, Desbois, Grant, Fleming, & Strong, 2006; Ben-Yishay et al., 1985), and communication (Dahlberg et al., 2007).

Classifying Performance in Awareness

Beyond establishing a theoretical model for awareness, one must also classify its clinical manifestations, or performance. The most frequently cited classifications of awareness come from the seminal work of Crosson and colleagues (1989). Awareness is classified into three tiers in Crosson's model. The first tier is intellectual or metacognitive awareness, which is defined as a person's overall knowledge of his existing problems or disorders. The second and third tiers, emergent and anticipatory awareness, are often lumped together and discussed as "online" awareness (Ciurli et al., 2010; Fleming, 2010). Emergent awareness is considered as the ability to recognize errors as they occur or the ability to detect cognitive failures in everyday performance, and anticipatory awareness as the ability to anticipate how a problem may be experienced during the completion of a particular task. Although some studies have not found these three levels to be hierarchical (Abreu et al., 2001), support for the distinction between these three types of awareness is found in the vast majority of studies. Disassociations between these types are evident in the literature; for example, Cocchini, Beschin, & Della Sala (2018) found that individuals with brain damage, regardless of hemispheric side of injury, will inaccurately predict the complexity or physical demands of a task (anticipatory awareness) but accurately evaluate their own motor limitations (metacognitive or intellectual awareness). Different assessment approaches also support the division of awareness into three parts; assessments of error detection best target emergent awareness, while self-other ratings (i.e. discrepancy scores) are considered the best measure of metacognitive or intellectual awareness (Dockree, et al., 2015; Hoerold et al., 2013; O'Keeffe et al., 2007a).

Toglia and Kirk (2000) proposed a dynamic model of awareness after brain injury that suggests awareness is comprised of metacognitive knowledge (i.e. defined as knowledge which exists prior to task onset) and situational awareness (i.e. knowledge activated throughout a task). Both are described as concepts that vary in depth (i.e. from subconscious to conscious), domain of concern, and influences (e.g. culture, context, motivation). Furthermore, self-awareness is theorized to require knowledge (e.g. of task, of strategies), self-knowledge (e.g. self-perception, affective states, beliefs about "why"), and the skill to appraise, self-monitor, and self-evaluate. The authors proposed that all these components work together to affect a person's response to feedback and "how perceptions of one's capabilities interact with task performance across and within separate domains" (p. 60).

Awareness can also be discussed as a relational concept directed towards an "object" of impaired function (Marková & Berrios, 2011; O'Keefe et al., 2007b). An object of awareness can be a specific skill (e.g. memory, strength) or domain (e.g. physical, emotional, relational, cognitive, situational), and an individual can demonstrate different types of awareness and different degrees of awareness for each and any of such objects (Lloyd et al., 2015). The idea that awareness differs depending on its object stems from work by Schacter and Prigatano (1991). Schacter and Prigatano suggested that clinical presentations of impaired awareness should be discussed in terms of partiality (i.e. the degree of awareness present for a deficit), specificity (i.e. the varying degrees of preserved awareness across different domains), and extension (i.e. the type of awareness impacted).

Assessment of Awareness

The majority of existing literature on self-awareness is published by the field of psychology and has methodologies that target the self-evaluation and self-monitoring of the research

participants' performance in cognitive areas such as memory (e.g. Galeone, Pappalardo, Chieffi, Iavarone, & Carlomagno, 2011), functional activities of daily living (e.g. Abreu et al., 2001), and vocational integration after brain injury (e.g. Malec & Moessner, 2000). Self-awareness for specific communication skills is infrequently evaluated in research literature, with the exception of general social pragmatic functioning (e.g. Douglas, Bracy, & Snow, 2015; Gabbatore et al., 2015). The two most common types of assessment for self-awareness can be described as either evaluative judgments (i.e. discrepancy scores between patient and informant) or performance monitoring (i.e. predicted performance versus actual performance) (Mikos et al., 2009). Discrepancy scores between an individual and a proxy, family member, clinician, or other informant are used almost universally in studies of awareness, because deterioration of awareness causes self-reports of cognitive or behavioral performance to be progressively unreliable. Ownsworth, Clare, and Morris (2006) stated that discrepancy scores are primarily useful because what people say (or how they rate themselves) is not always reflective of how they will act; therefore an informant rating can provide a more accurate picture of client ability. Despite this, the potential for inaccuracies between self and informant ratings on particular skills or tasks has been highlighted in several studies. For example, Maki, Amari, Yamaguchi, Nakaaki, and Yamaguchi (2012) found a large disparity between patient and caregiver perspectives on the causes of distress felt by the patient; and de Langavant and colleagues (2013) found that proxy ratings of the memory functioning in individuals in the early stages of Huntington's were less accurate than patient self-ratings, with the proxies' judgements of individual memory negatively influenced by decline in overall functioning. Williamson and colleagues (2010) suggested this issue could be avoided by generating discrepancy scores between a patient's actual performance and his pre- and post-test self-estimates of performance, rather than using an informant/proxy.

Presentation and Course of Awareness Deficits

Relatively preserved awareness in the face of deteriorating cognitive, behavior, physical, or functional skills is associated with various affective symptoms; for instance, greater degrees of depression (van Vliet et al., 2013), anxiety (Aalten et al., 2006), and distress that is not always well understood by the individuals family or caregivers (Maki et al., 2012). Mild awareness deficits and/or improving awareness deficits have been linked with decreased ratings of quality of life and poor self-image in some studies (Formisano et al., 2016; Lloyd et al., 2015); indicating that with greater awareness, a greater realization of negative functional life changes may occur. Additionally, unexpected task failure due to impaired self-awareness can cause a range of reactions, from acceptance to more negative responses such as blaming, avoidance, resistance, anxiety, or confusion. Such negative reactions are associated with lower ratings of satisfaction and self-efficacy (Toglia & Kirk, 2000).

Deficits in self-awareness occur most frequently in individuals with neurological damage. While the presence of impaired awareness is relatively predictable across a multitude of brain disorders, the presentation and course of awareness deficits is by no means homogenous. The etiology of brain damage, whether sudden onset trauma such as stroke, TBI, or a progressive neurodegenerative disease such as dementia, will heavily influence the clinical presentation and course of awareness deficits.

Progressive neurodegenerative disease.

Presentation of awareness deficits. Amanzio and colleagues (2013) found that individuals with frontotemporal dementia (FTD) demonstrated significantly greater impairment on tasks of emergent awareness compared to individuals with corticobasal degeneration (CBD) and supranuclear palsy (PSP), and all groups demonstrated impaired metacognitive knowledge of

deficits. Eslinger and colleagues (2005) examined the metacognition, self-prediction, and self-monitoring skills of patients diagnosed with FTD or Alzheimer's and found that FTD patients showed significantly greater impairments of metacognitive and self-monitoring knowledge than the Alzheimer's group. In both groups, the first clinical signs of impaired awareness are often apathy and disinhibition (Aalten et al., 2006; Amanzio et al., 2013; Eslinger et al., 2005). In Alzheimer's, the object of impaired awareness is typically memory functioning (Lehrner et al., 2015). Galeone and colleagues (2011) studied individuals with diagnosed mild cognitive impairment (MCI) or mild Alzheimer's for awareness of memory deficits and found reduced awareness for memory abilities in both groups along with consistent overestimation of their own performance. In addition, participants in this study showed no evidence of regulatory or monitoring behavior to adjust their estimations despite consistent overestimation across multiple failed performances.

Course of awareness. Progressive neurodegenerative diseases will cause deterioration of awareness skills with the passage of time across all domains (Mulligan, Smart, Segalowitz, & MacDonald, 2018; de Langavant et al., 2013). This has been proven in studies of dementias of various types (e.g. vascular, Lewy body; Aalten et al., 2006), Huntington's disease (de Langavant et al., 2013), and Alzheimer's disease (van Vliet et al., 2013). Aalten and colleagues (2006) found a significant association between time post-onset of dementia and level of awareness in a prospective follow-up study of 117 patients with diagnosed dementia; significant reductions in awareness occurred for the majority of patients from baseline to 18-month follow-up. Van Vliet and colleagues (2013) found that individuals with late-onset Alzheimer's disease were twice as likely to demonstrate impaired awareness as those with young onset AD.

Sudden onset brain damage. Sudden onset brain damage can cause awareness deficits that are likely to improve with time. In individuals with stroke, the most commonly reported type of awareness deficit is anosognosia for hemiplegia; many studies find that anosognosia after stroke resolves within 3-6 months (Gasquoine, 2016). After TBI, deficits in awareness are very common at all stages of recovery regardless of injury severity (Flashman & McAllister, 2002), but these deficits steadily decrease in severity as time post-onset increases, particularly in the first year following injury (Curtiss et al., 2007; Dirette & Plaisier, 2007; Robertson & Schmitter-Edgecombe, 2015). Awareness deficits are often long-lasting, however; Malec and Moessner, (2000) reported residual impairments in self-awareness at one-year post-TBI. Kelly and colleagues (2014) examined the association between awareness deficits and employment, life-satisfaction, and cognitive functioning at five or more years post-moderate to severe TBI, and found evidence of impaired awareness as much as 16 years post injury.

Awareness and TBI

Presentation of awareness deficits. Impaired awareness after TBI has the following clinical presentation: (a) loss of self-knowledge (e.g. false judgments about oneself or loss of access to knowledge regarding a task), (b) overestimation of task performance, (c) poor task performance (e.g. no recognition of errors, failure to use strategies, no comparison of past and current performances), (d) inability to adjust performance when errors are recognized, (e) poor self-evaluation, and (d) failure to integrate new experiences over time (Toglia & Kirk, 2000; Robertson & Knight, 2008; Prigatano, Altman, & O'Brian, 1990). Individuals with TBI may also underreport cognitive, affective, and social struggles which occur in their daily life (Dockree et al., 2014; Hart et al., 2004) and have difficulty monitoring errors during tasks (Robertson & Schmitter-Edgecombe, 2015). Hart and colleagues (2004) found that individuals with TBI are

more likely to report deficits in physical function than in cognitive or behavioral functions; in addition, the authors reported that overestimations of competence occur regardless of the objective severity of the awareness deficit. Douglas and colleagues (2015) associated TBI with impaired self-awareness for social communication deficits and underreport of these deficits compared to proxy ratings; the authors measured social communication skills including knowing when to talk and when to listen, starting conversation, thought organization, speaking or acting appropriately, and other items in the La Trobe Communication Questionnaire. In addition, the results of the study have indicated that impaired self-awareness for social communication skills was associated with higher unemployment after injury.

Impaired self-awareness can impact the selection and successful application of cognitive-communicative compensatory strategies. Practically speaking, the SLP must remember that, after brain injury, a person must significantly restructure his knowledge and beliefs about his own cognitive strengths and limitations, and this is hindered at times by impaired self-awareness (i.e. the inability to accurately experience problems and feedback; Toglia & Kirk, 2000). Crosson and colleagues (1989) proposed that deficits in awareness can act as a barrier to successful implementation of cognitive-communication compensatory strategies; impaired self-awareness may cause an individual to (a) deny the existence of a deficit and thus see no need for compensation, or (b) recognize a deficit but lack adequate self-awareness to support the implementation of an appropriate compensatory strategy. Dirette and Plaisier (2002) stated that relatively preserved self-awareness is a prerequisite for using cognitive-communicative compensatory strategies successfully, and Tate and colleagues (2014) suggested metacognitive strategy instruction is only useful if a person already has some degree of awareness alerting them to the need for such strategies and the context within which to use them. Crosson and colleagues

(1989) examined the relationship between awareness and compensation and emphasized that the selection of cognitive-communication compensatory strategies depends on the client's self-awareness skills. The authors described four categories of compensatory strategies that can be used to treat cognitive-communicative deficits: anticipatory, recognition, situational, and external.

First, anticipatory compensations are strategies that are initiated if a problem or error is anticipated. For example, a person with memory deficits would initiate note-taking when listening to a church sermon. Second, recognition compensations are strategies that are reliant on the recognition that a problem is occurring (i.e. emergent awareness). For example, a person with disorganized and tangential speech would recognize the nonverbal signals of a conversation partner indicating his speech is off topic, and thus refocus his conversation to the main point. (This particular example also implies that the client has been taught how to recognize nonverbal cues and how such cues relate to their own speech or behavior.) Third, situational compensations are strategies initiated by the occurrence of a specific circumstance. For example, a student with memory deficits might initiate note-taking during class but not during casual conversation with peers. Fourth, external compensation strategies are initiated by others to aid the individual with deficits, or the alteration of the individual's working/home/social environments. Crosson and colleagues (1989) asserted that successful application of any compensatory strategies will depend on whether they have been appropriately selected based on the client's type of impaired awareness. For instance, those with impaired intellectual awareness can use external compensations to increase their overall knowledge of deficits; those with impaired emergent awareness can use external and situational compensations but would be unable to use recognition strategies (because recognition strategies rely on preserved emergent awareness); and those with anticipatory awareness deficits can use external, situational, and recognition compensations. In addition, the

chosen strategies should build on any awareness skills that are relatively preserved, and bypass those areas that are deficient (Crosson et al., 1989).

Treatment for Awareness Deficits after TBI

While there may be more than enough evidence to identify impaired awareness after TBI, the ability to treat awareness deficits in a quantitatively measurable way can be a challenging task. There are significant differences in research literature on how researchers operationally define awareness, what is studied as the object of awareness, and how self-awareness is measured. In addition, "the concept of awareness must be translated to a clinical phenomena, elicited at a particular time in a particular way" (Clare, Marková, Roth, & Morris, 2011, p. 937). Despite this, self-awareness has been identified as the therapy goal targeted second most often (after executive functioning/organization) by therapeutic professionals treating adults with mild-moderate TBI (Brundage, Bowers, Garcia-Barry, & Schierts, 2006).

The methods for direct treatment of impaired self-awareness vary enormously in the literature. Different approaches include educational instruction and discussion to improve metacognitive awareness, direct feedback to improve emergent and anticipatory awareness, and psychotherapeutic treatment for clients exhibiting denial (Medley & Powell, 2010). Brundage, Bowers, Garcia-Barry, and Schierts (2006) suggested that overall self-awareness is often addressed via clinician-directed explanation and discourse, and Dimaggio and colleagues (2011) proposed that therapists should use such methods to build on a client's existing metacognitive skills, thus gradually promoting metacognitive growth. Dockree and colleagues (2015) promoted error detection as a means to increase the recovery of metacognitive knowledge after TBI. Error detection may be enhanced through feedback; feedback methods of various types have induced modest improvements on self-awareness deficits of all severities (Schmidt, Lannin, Fleming, &

Ownsworth, 2011). Examples of feedback types include video plus verbal, verbal only, and experiential; Tate and colleagues (2014) promoted the use of direct corrective verbal feedback to treat impaired awareness, while Schmidt, Fleming, Ownsworth, & Lannin, (2013) reported that video plus verbal feedback (i.e. self-observation and guided reflection, respectively) produced greater improvements in metacognitive and online awareness than other feedback approaches. The authors proposed that this result was due to the technique's role in both facilitating error monitoring, and in supporting an individual's ability to process the meaning of their experience and modify his beliefs about his own abilities.

Fleming & Ownsworth (2006) highlighted compensatory-based strategies (i.e. compensating for deficits and facilitating strengths) as an efficacious approach for treating impaired self-awareness. Crosson and colleagues (1989) defined compensation as "the deliberate application of a procedure that enables a patient to obtain a goal; the realization of which would otherwise be prevented by impaired functioning" (p. 46). However, independent initiation of compensatory strategies is, to some degree, dependent on preserved emergent awareness. Deficient emergent awareness is characterized by an inability to recognize when a problem is occurring; thus, an individual may be able to define a deficit and even identify and describe appropriate strategies to apply, but will not perceive the need to initiate the strategy when a problem occurs.

Ylvisaker, Szekeres, and Feeney (1998) described treatment for self-awareness along a continuum of low confrontation (e.g. daily conversations on upcoming tasks, self-monitoring systems, peer teaching) to high confrontation (e.g. verbally reciting deficits, presentation of failed tasks, and self-observation). However, they cautioned against high confrontation approaches, suggesting that it can cause anger and denial in clients, especially when used without consideration of the individual's emotional fragility. Confrontational styles of intervention have also been

association with decreased patient compliance (Patterson & Forgatch, 1985) and the entrenchment of confabulatory beliefs (Bieman-Copland & Dywan, 2000). Although none of the above studies provided empirical explanations for these negative reactions (i.e. anger, denial, noncompliance), it is theorized that direct confrontation puts individuals with impaired self-awareness on the defense, and that confrontation may be perceived both as an attack on the individual's sense of self and as a method by which an outsider reveals unwanted changes in their person that they cannot accept and reconcile with their self-image (Ylvisaker et al., 1998).

Directly treating impaired self-awareness after TBI may have the benefit of showing directionality of treatment effects. However, studies directly targeting self-awareness, particularly after TBI, are few. Llorens et al. (2015) used an education-based group therapy in a six month longitudinal study to target intellectual and emergent awareness in 42 adults with TBI. Participants engaged in a digital board game requiring them to answer questions covering general knowledge of anatomical and pathological matters related to TBI, to engage in situational reasoning through social or communication breakdowns, and to complete role-playing exercises. According to the pre- and post-test scores on the Self Awareness Deficits Interview (Simmond & Fleming, 2003) and the Patient Competency Rating Scale (Prigatano et al., 1986), participants made improvements in metacognitive self-awareness, perception of deficits, realistic goal-setting, and social and behavioral management skills.

Ownsworth, McFarland, and Young (2000a) administered a sixteen week cognitive-behavioral awareness training program that focused on improving self-awareness in the everyday life and psychosocial functioning of 21 individuals with acquired brain injury. Self-awareness for deficits, consequences of deficits on daily life, and realistic goal-setting were addressed in group therapy once a week using techniques such as guided self-reflection, role playing, collaborative

development of compensatory strategies, and in-session practice of new skills. Pre-treatment and post-treatment scores on the Self-Regulation Skills Interview (SRSI; Ownsworth, McFarland, and Young, 2000b) were indicative of improved emergent and anticipatory awareness, motivation, and strategy generation, use, and effectiveness; improvements in social interaction, emotional behavior, and communication were indicated by pre and post-treatment scores on the Sickness Impact Profile (Bergner, Bobbitt, Carter, & Gilson, 1981).

Goverover and colleagues (2007) treated anticipatory awareness in ten participants with acquired brain injury in a randomized control trial. The focus of the treatment was self-awareness during performance of functional activities of daily living (ADLs). Participants were required to predict their expected performance on an ADL, then evaluate their performance on that ADL after completion. Scores on the Awareness Questionnaire (AQ; Sherer, Berhloff, Boake, High, & Levin, 1998), the SRSI, and the Assessment of Awareness of Disability (Kerstin, Bernspång, & Anne, 1999) were indicative of significantly improved overall ADL performance and self-regulation skills; metacognitive self-awareness and task-specific awareness also showed improvement but did not reach statistical significance.

McAvinue, O'Keefe, McMackin, & Robertson (2005) targeted emergent awareness in a sample of 18 TBI participants and a follow-up sample of 19 TBI participants during a sustained attention task. The sustained attention task used for this study (i.e. Sustained Attention to Response Task [SART]; Robertson, Manly, Andrade, Baddeley, & Yiend, 1997) was a computerized go/no-go task in which numerical sequences were presented to the participants, who were required to withhold a mouse click (i.e. no-go) when a target number flashed on the screen. Within the first sample, participants verbally identified their own errors as they occurred throughout the task; in the second sample, a computer generated tone sounded for any incorrect

responses. In both conditions, provision of feedback caused significant reductions in error frequency (i.e. responding with a mouse click to the no-go target) compared to trials in which no feedback was given.

In a study of healthy volunteers enrolled in a college chemistry course, Casselman and Atwood (2017) found that metacognitive awareness skills as well as task-specific performance on assessments can improve with the application of metacognitive strategies. Improvements were measured by calculating the accuracy of self-predictions of performance and noting improvements in grades across the semester. The metacognitive strategies trained in this study included prediction, reflection, and creation of a plan to address deficient knowledge areas. Specifically, participants would predict their grade on an upcoming chemistry test and rate their overall knowledge/ability; then following the test, participants would receive detailed feedback on their performance, including target areas to address based on frequency of errors.

The treatment of awareness deficits is often incorporated into broader TBI and cognitive-communicative treatment. Rather than treating awareness directly, metacognitive awareness strategies (typically involving self-monitoring and feedback) are often used in these studies to indirectly target awareness during cognitive-communicative remedial programs. Metacognitive approaches can be used to increase self-awareness and skill level for a variety of cognitive, behavioral, and language goals. Perhaps unfortunately, the focus of such studies is typically cognitive-communicative outcome, and any measure of modality specific self-awareness is omitted from the results. Also, because awareness is treated simultaneously with other deficit areas, there is a lack of clarity in these studies regarding the directionality of the described treatment effects. In other words, it is unclear whether improvement of awareness results in cognitive and/or communicative gains, or whether cognition or communicative gains improve a

person's self-awareness. In addition, the object of awareness (e.g. cognition, behavior, social skills) is rarely homogenous across studies making comparisons of treatment efficacy difficult.

For example, Waid-Ebbs and colleagues (2014) described the effects of a metacognitive intervention Goal Management Training (GMT) on executive function in six veterans with blast-related TBI. The ten week program was comprised of teaching, group interaction, and practice of executive skills both in session and at home. Throughout the program, all participants were taught a five step metacognitive strategy for "increasing awareness and proficiency" (p. 1558); steps included (a) "stop-what am I doing?;" (b) "define the goal;" (c) "list the steps;" (d) "learn the steps;" and (d) "check- am I doing what I planned?" In addition, target skills were addressed by weekly discussion of participant strengths and weaknesses, the identification and practice of compensatory strategies both in session and at home, a discussion of how successful these strategies were implemented, and a weekly review of progress towards each participants' goals. Improvements in executive function (specifically planning and problem-solving) were measured using baseline, weekly, and follow up probes from the computerized Tower of London (Culbertson & Zillmer, 1998) assessment. Participant performance on these probes revealed a significant acquisition and improvement of executive skills. Yet, no overall measure of self-awareness or skill-specific measure of self-awareness was provided, even though the methodology of the GMT program is almost exclusively reliant on increasing self-awareness for specific executive skills.

Likewise, Ehlhardt, Sohlberg, Glang, and Albin (2005) used the metacognitive strategies of prediction and reflection during an instructional program targeting new learning and memory in four individuals with brain injury. The aim of the study was to teach participants how to use an email interface on the computer. The components of the program were task analysis (i.e. knowing what to do and breaking the process into steps), errorless learning (i.e. each step was modeled for

the participants), assessment of performance, cumulative review of learned skills, and high rate of practice trials. For each step of the email process, participants were required to predict their performance, and then reflect on their actual performance once the step was completed. The authors reported high success of the program as measured by participants' recall of the email process at cessation of treatment; however, the impact of the metacognitive strategies and/or any measure of improved self-awareness was not included in discussion.

Cantor and colleagues (2014) focused on cognitive remediation of executive function in a randomized controlled study of the Short-Term Executive Plus program. This ten week program for 98 TBI participants had four main components, the first two weeks of which were focused primarily on improving metacognitive self-awareness: (a) problem-solving training: teaching metacognitive strategies to identify problems and strategies and to discuss satisfaction the with the outcome of decided action; (b) emotional regulation training: developing self-awareness of the internal physiological and cognitive aspects of emotion as well as to understand the relationship between thoughts and behavior; (c) attention training: improving divided, selective, and alternating attention skills; and (d) external aid training: teaching individualized strategies (e.g. use of a planner) to support individual goals. Improvements in executive function were measured by compiling a composite score via factor analysis of the subtests on the Problem Solving Inventory (Heppner & Petersen, 1982), Frontal Systems Behavior Scale (Grace & Malloy, 2000), Behavioral Assessment of the Dysexecutive Syndrome (Alderman, Evans, Burgess & Wilson, 1993), and Self-Awareness of Deficits Interview (Simmond & Fleming, 2003); significant positive treatment effects for problem-solving and executive functioning were found at cessation of treatment. Again, although the program is explicitly described as intensive metacognitive skill training, the active

ingredients (e.g. degree and improvement of self-awareness) of the program were not partitioned out for analysis.

Gabbatore and colleagues (2015) targeted pragmatic communication in a study of 15 adults with TBI enrolled in a training program entitled the Cognitive Pragmatic Treatment. The focus of this program was to improve specific communication skills (e.g. recognition and manifestation of facial skills, management of telephone conversations, etc.) across 24 sessions led by a psychologist in a 12 week period. Communication skills were targeted by comprehension and production activities involving the observation of videotaped scenes depicting social interactions and through role-playing social scenarios, respectively. To improve social self-awareness, the participants' role-playing was also videotaped, then used for provision of feedback and for an opportunity to self-analyze their communicative performance. Although significant improvements in communicative pragmatic skills were achieved according to the pre and post test scores on the Assessment Battery of Communication (Bosco, Angeleri, Zuffranieri, Bara, & Sacco, 2012), the authors provided no description or measurement of the video or the verbal feedback process used to target self-awareness in the participants.

A final example of indirect treatment of self-awareness is Fyrberg's (2013) case study of the communicative effectiveness in a teen client with TBI. The effectiveness of the client's verbal responses, gestures, posture, eye gaze, and facial expressions to communicate a main idea and participate in conversation were analyzed during guided self-evaluations of videotaped conversation. Qualitative self-review of the client's performance during two conversations indicated that the client had difficulty managing turn-taking, comprehension, and initiation during three-party dialogue, and that the client did not ask for clarification when confused. Although the focus of the study was to describe the communication of the client, the methodology, namely the

self-analysis and discussion of his communicative effectiveness, was designed to improve the self-awareness of the client's verbal and nonverbal behaviors and thereby enhance his communicative effectiveness during future communicative interactions. Despite this, self-awareness was not explicitly measured or discussed.

A Clinical Model of Cognition and Awareness

It is difficult to find an empirically supported theoretical rehabilitation model that has clinical application for TBI intervention and which depicts both cognitive functioning and awareness. The following model, adapted from the work of Ben-Yishay and colleagues (1985), is a depiction of the interaction between awareness and multiple cognitive and neuropsychological processes after TBI (Origami, n.d.).

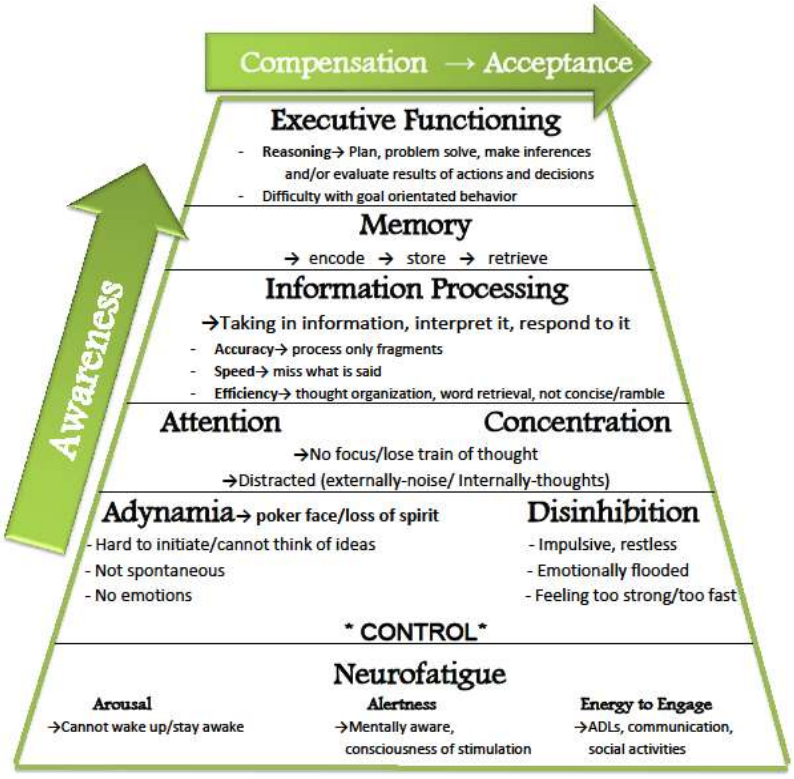


Figure 1. Clinical model of the hierarchy of cognitive and neuropsychological recovery processes after TBI.

It could be argued that there are two key points of the model. First, there are progressive stages of cognitive neuropsychological functioning. An individual may pass through these stages at various speeds of recovery post-injury, and some individuals may skip deficits in each stage entirely. Although primarily hierarchical levels are depicted in the model, the levels are also interactive; in other words, individuals may demonstrate residual deficits across levels of cognitive functioning (e.g. neurofatigue with executive dysfunction). Second, the third theoretical view of awareness presented earlier in this paper (i.e. that awareness is both global and skill specific) is represented in this model. Here, awareness has both vertical and lateral interactive relationships with cognition. It functions as both an overarching construct operating parallel to cognition, as well as a skill-specific construct that underlies an individual's ability to compensate for and accept specific cognitive deficits. The clinical presentations of awareness discussed in Schacter and Prigatano (1991) are depicted in this model, namely: partiality, specificity, and extension. By showing the laterality of awareness required for compensation and acceptance of each or any aspect of cognition, partiality is depicted; through focusing on the domain of neurocognitive functioning, specificity is shown; and by showing the global nature of awareness that can improve both independently and dependently to cognitive improvement, extension is depicted.

While the purpose of this paper is not to argue for the use of this model specifically, evidence for the hierarchy of cognitive and neuropsychology functioning can be found in literature across many disciplines. A similar hierarchy is utilized in Dams-O'Connor and Gordon's (2013) model of TBI neurorehabilitation. The authors postulated that arousal, attention, and information processing (i.e. the reception and interpretation of sensory stimuli on both perceptual and conceptual levels, using the perceptual, cognitive, and linguistic functions of the brain; ASHA, 1993) are fundamental prerequisites for higher order cognitive skills such as executive functioning.

Just as depicted in the lowest level of the adapted hierarchy depicted in this paper (see Figure 1), Robertson and Levine (2013) postulated that arousal is the most basic underlying factor supporting cognitive functioning, and that various levels of arousal can be elicited in a person with brain damage. Evidence for a broad information processing system supporting memory function is found in Cowan (1988), Craik and Lockhart (1972), and Huitt (2003). Importantly, it is worth noting that each of these cognitive constructs share neural circuitry and are overlapping to some degree; this overlap is reflected in some models of working memory in which memory is described as the processing of information into memory components through directing attention to new or existing information, by using a system of executive control (Baddeley, 2003).

Although directionality is not always apparent, evidence for the interaction between awareness and cognition as depicted in the hierarchy is also found throughout empirical literature. Although by no means exhaustive, the following studies are examples of support. Amanzio and colleagues (2013) identified factors predicting reduced awareness. In order of lowest neuropsychological functioning to highest cognitive functioning, the factors depicted in their model include mild behavior change (specifically, apathy and disinhibition), auditory comprehension, episodic memory, and the executive skills of response inhibition and behavior monitoring. Attention is also associated with tasks of awareness; tasks of sustained attention combined with provision of feedback on errors can significantly improve emergent awareness and reduce frequency of errors in individuals with TBI (McAvinue, O'Keefe, McMackin, and Robertson, 2005). Underlying memory functions have been linked to awareness in some models; Agnew and Morris (1998) suggested that upon recognition of an error, a person may fail to encode the error into his semantic memory and therefore believe his skill level is appropriate for a repeated trial of the failed task; or, a deficit registers in implicit memory but is not explicitly accessible to

the person such that he denies the deficit even while subconsciously avoiding tasks requiring that inadequate skill. Morris and Hannesdottir (2004) also linked awareness to underlying memory, suggesting that a person's memory system compares task outcomes and self-concept of skill, and mismatches between those components are used to update the person's metacognitive awareness system and behavioral regulation.

Using the model adapted from Ben-Yishay and colleagues (1985), several clinical applications for treatment of cognitive-communicative deficits and impaired awareness become apparent. First, the selection of cognitive therapy goals must show consideration for underlying and lower level cognitive and/or neuropsychological functioning. For example, a client presenting with information processing deficits may actually lack the sustained attention necessary to process visual/verbal/written information. Or, a client struggling with goal orientated behavior (i.e. executive functioning) may really be suffering from a memory impairment preventing the retention and/or access to long-term goals or strategies to reach target goals. Second, direct treatment of awareness deficits can positively impact overall recovery through the hierarchy of cognitive functioning by improving in concert with and parallel to recovering cognition. Llorens and colleagues (2015) and Ownsworth and colleagues (2000) (described earlier) demonstrated how direct treatment of awareness can yield improvements not only in intellectual, emergent, and anticipatory awareness levels, but also in specific cognitive-communicative areas like goal-setting, problem-solving, motivation, communication, and social interaction. Both direct and indirect treatment of awareness during cognitive-communicative rehabilitation may help an individual to develop acceptance and compensation for specific cognitive deficits by increasing their recognition of deficits and knowledge of strategies by which to address them; this is particularly important if restoring pre-morbid functioning is an unrealistic goal for the client.

Treatment Frameworks, Strategies, and Activities

The theoretical model discussed above is a description of the interaction between awareness and cognitive-communication and has practical applications on the determination and efficacy of select therapy goals (e.g. self-awareness or other cognitive-communication skills). Other theoretical rehabilitation frameworks fit within this broad model and may have influence on practical approaches to TBI treatment. Unsurprisingly, many of these frameworks are based on strongly differing views of TBI rehabilitation within the field of speech-language pathology.

For example, Turkstra, Normal, Whyte, Dijkers, and Hart (2015) proposed a treatment taxonomy that discusses components of treatment in terms of targets, ingredients, and mechanisms of action; where "targets" refer to the specific area intended to change, "ingredients" refer to certain techniques or stimuli used that are essential to a specific treatment approach (e.g. didactic instruction versus thorough practice), and "mechanisms of action" refers to the hypothesized means that by which ingredients cause change (e.g. increasing knowledge base versus improving skilled performance). The authors emphasized the importance of identifying the ingredients of a treatment approach, theorizing that an understanding of the active ingredients could not only direct the SLP to the best methods for treating a target, but also minimize time spent on less efficacious approaches during treatment.

In contrast, Ebert and Kohnert (2010) de-emphasized specific ingredients of treatment with a preference for "common factors," where common factors refers to aspects of treatment that are essential to the treatment but not unique (e.g. therapists). The authors then prioritized the role of the therapist in affecting change in the client and supported this view with a study of child language impairments which found that participants enrolled in different but equally viable treatments demonstrated comparable positive results (e.g. Gillam et al., 2008). Ebert and Kohnert theorized

that the specific ingredients of each treatment condition were not enough to produce significant differences in the overall positive outcomes; rather, the outcomes were achieved by the common factors of the treatment conditions; namely, the empathic therapist and engaged client.

Often, SLPs treating awareness and cognitive-communicative deficits after TBI operate within theoretical frameworks aligning with positive behavior support (PBS; i.e. targeting functional behavior in natural environments with a primary focus on client choice, individualized activities, and controlling environmental and internal antecedents) rather than highly controlled, clinician-led applied behavior analysis (ABA; Ylvisaker, Turkstra, & Coelho, 2005). However, a combination of ABA and PBS may be used; for instance, the focus of rehabilitation may be to both change specific behaviors (ABA) as well as make lifestyle adjustments that are satisfactory to the client and family (PBS).

Kleim and Jones (2008) proposed several principles of neurorehabilitation that were reliant on experience-dependent neural plasticity after brain injury. In other words, they advocated for the selection of treatment methods based on the underlying neural recovery occurring in the client. For example, the inclusion of multisensory stimuli to prevent the functional degradation of neural circuits not actively engaged in a task, paired with specificity of training that enhances the functioning of specific neural circuits; also, high frequency, intensity, and saliency of practice to capitalize on the nature of plasticity at different stages of recovery. Ben-Yishay and Diller (1993) discussed cognitive rehabilitation in terms of restoration and compensation, or a combination of the two; a restorative approach attempts to recover pre-morbid functioning while a compensatory approach equips the client to function as well as possible given his ongoing deficits.

Within these frameworks, there are general TBI strategies, or ingredients, that have an empirical evidence-base, for example: errorless learning, strategy training, and group treatments

(Togher et al., 2014), as well as repetition and consistency, modeling and scaffolding of behavior, and environmental modifications (Dumas, Bedell, Hamill, 2003). The application of these strategies during treatment can vary in intensity, comprehensively defined by Warren, Fey, and Yoder (2007) as the dose (defined as the number of teaching/learning opportunities within a session), dose form (i.e. the strategies used), dose frequency (the number teaching/learning opportunities per day and week), total intervention duration, and the cumulative intervention intensity (the product of dose times frequency times intervention duration).

Once an SLP is firmly grounded in a theoretical framework and equipped with evidence-based strategies by which to address goal areas, he/she still needs to generate appropriate therapeutic activities within which to apply these strategies towards a particular goal. For example (and returning to the strategies mentioned previously), an SLP may judge that a client with memory deficits would benefit from errorless learning, but must determine the task and context in which to apply this technique.

Careful selection of therapy tasks is important to eliciting improvements in awareness and cognitive-communication. One factor to consider during task selection is the complexity or cognitive load of a potential therapy task. Robinson and Gilabert (2007) described the Cognition Hypothesis of task complexity, promoting the ideas that (a) a task should be designed and sequenced to increase in complexity until it approximates the complexity of a target, real-world activity; and (b) sequentially increasing the complexity of a task will theoretically improve a person's accuracy, learning ability, and performance. However, Harvey, Hapsburg, and Seeman (2017) found that higher task complexity was associated with decreased processing speed and decreased visual and auditory accuracy in normal adults. The findings of both these studies, examined together, have implications for SLPs working with individuals with impaired cognition;

namely, that SLPs must be cautious that the cognitive load or complexity of a selected task does not diminish a client's existing cognitive skills, but rather enhances and builds the person's skills over time. Another important component of task selection is familiarity and neutrality; tasks that were once familiar to a person may need to be simplified or altered according to his information processing abilities after TBI. In addition, while familiar tasks provide saliency and a premorbid baseline to which individual can compare his current performance, new and/or emotionally neutral tasks may be less likely to threaten a person's self-identify in times of failure or be perceived by the person as confrontational, thus potentially allowing awareness to emerge more easily (Toglia & Kirk, 2000).

A TBI client is most likely to engage in a therapeutic task targeting the restoration of lost skills or compensation for deficits if the task is individualized, functional, and collaborative. Individualized treatment tasks are those that have been created with an understanding of the client's neuropsychological and psychosocial status, learning abilities, relevant communication partners, and premorbid communication and cognitive status (Togher et al., 2014). Functionality refers to the ability of a task or goal to transfer from the therapy office into the client's current and anticipated real-world setting and activities (Ylvisaker, Szekeres, & Feeney, 2008); functional activities should be developed with consideration for a client's premorbid interests, discharge setting, and the skills needed for that discharge setting (Mills, 2014). Functional and individualized tasks are by nature diverse and particular to each client; examples of such tasks could be completion of job applications, buying from mail order catalogs, developing a monthly checklist for car care, practicing taking phone messages, planning a week's menu and grocery list, role-playing social scenarios, and the list could go on indeterminately (Mills, 2014.).

Finally, a task should also be collaborative, in two senses of the word. First, it must be selected in collaboration with the client such that his input is instrumental in the determination of the task (Hand, 2006). Second, it must lend itself to collaborative, interactive discussion between the SLP and client regarding the achievement of the target goal. For instance, the task should be structured such that it provides opportunities for collaboration on (a) identifying appropriate alternatives to undesirable behaviors, (b) the selection of future activities and identification of acceptable behaviors within those activities, (c) the determination of the strategic procedures used by the SLP to facilitate target behaviors, and (d) the determination of compensatory strategies used by the client to overcome ongoing deficits (Ylvisaker et al., 2008). This collaboration, in both meanings of the word, will shift the dynamic of the therapeutic relationship from one of teacher/student (SLP/client, respectively) to a more equal partnership in which the client must take an active role in his rehabilitation, share responsibility for his engagement in the task, and build a positive therapeutic alliance between the himself and SLP (Hand, 2006; Geller & Foley, 2009).

Therapeutic Alliance

Therapeutic alliance is another factor contributing to successful cognitive-communicative rehabilitation of individuals with impaired awareness after TBI. Indeed, it has been discussed as a prerequisite for the collaborative development of a treatment program (Pinto, 2009). In the previous sections of this paper, strategies and models for treatment of awareness and cognitive-communicative deficits were described that were almost exclusively mediated through human interaction with the therapist. In context of speech-language pathology, this highlights the weighty responsibility that falls on the SLP both to (a) use appropriate theoretical frameworks when designing therapeutic activities or educating the TBI client on compensatory strategies; and (b) establish and maintain a positive therapeutic alliance with his/her clients with TBI such that the

client is willing to engage and remain engaged in the therapeutic process, regardless of the specific deficits targeted.

Theoretical models. While much of the research on therapeutic alliance is produced from the field of psychology with reference to psychotherapy, the principles of therapeutic alliance are applicable to many health care professions dealing directly with patient care, including the field of speech-language pathology. Orlinsky and Howard (1986) suggested three dimensions of alliance between the client and clinician that included empathic resonance, mutual affirmation, and the investment of both parties in the therapy process. Bordin (1979) also suggested three features of therapeutic alliance: agreement on goals, development of bonds, and the assignment of a task or series of tasks. Other theories touch on therapeutic alliance with a perspective of development psychology (e.g. attachment theory) or sociology (e.g. a social influence process, [Strong, 1968] or patient empowerment, [Kim, Boren, & Solem, 2001]). Ackerman and Hilsenroth (2003) suggested that the concept of alliance originated in Freudian theories of positive transference from client to therapist, but has since shifted to encompass active collaboration between two parties. Cailhol et al. (2009) echoed this mindset, stating "therapeutic outcome is related to the perception of collaboration between patient and therapist towards a common goal, rather than the perception of the therapist as providing help" (p. 232).

Role of the therapist in establishing therapeutic alliance. A trusting therapeutic relationship is a prerequisite for a patient's acceptance of deficits, and in turn, acceptance and self-awareness of deficits (and of the deficits' impact on life functioning) is crucial for engagement in rehabilitation (Schonberger et al., 2006; Medley & Powell, 2010). Toglia and Kirk (2000) stated that "the power of a close alliance cannot be underestimated in helping persons with brain injury to recognize and accept their difficulties" (p. 67).

Researchers have described a number of practical and salient elements necessary for the development of a therapeutic alliance that focus on the role of the therapist. For example, the selection of collaborative therapeutic activities and client-centric conversation are associated with positive therapeutic relationships (Green, Stevens, & Wolfe, 1997), as are techniques such as reflection, support, accurate interpretation of clients' verbal and nonverbal behaviors, affirmation of past successes, and attending to client's experience (Ackerman & Hilsenroth, 2003). Green and colleagues (2003) suggested several strategies for strengthening therapeutic bond between SLPs and clients, including: soliciting the client's viewpoints, encouraging the client to talk about himself, requesting the client's perspective, pointing out the client's positive actions or qualities, and responding to frustration or concerns with genuine care. Cailhol and colleagues (2009) found a stronger positive correlation between alliance and treatment outcome when therapists focused "on empathic listening, guidance, support and alliance" (p. 230) rather than identifying and resolving a "root" issue.

According to Ackerman and Hilsenroth (2003), therapist attributes that contribute to a positive therapy alliance include characteristics such as warmth, friendliness, expertise, flexibility, trustworthiness, and honesty. In contrast, clinician personality traits were not significantly correlated to behavioral interactions during voice therapy in a study of voice treatment by Andrews and Schmidt (1995); rather, the degree of similarity between both the clinician and the client personality scores were predictive of positive working interactions. Ebert and Kohnert (2010) identified rapport and communication as the characteristics of SLPs that were likely to impact treatment outcome; as these characteristics were less reflective of an individual as they were factors of therapeutic alliance, the authors concluded that behaviors pertaining to the establishment of a clinician-client relationship influenced outcomes more than an SLP's individual traits.

Therapeutic alliance, the therapist, and self-awareness. In existing literature on the self-awareness of clinical practitioners, self-awareness is often discussed under the framework of "reflective practice." Reflective practice is a term that is used to describe the active and continual monitoring of in-therapy clinical behavior (Caty, Kinsella, & Doyle, 2015). As self-monitoring is also inherent to the definition of self-awareness, it appears that reflective practice is differentiated from self-awareness by its reference to the actions taken by clinical therapy professionals to reflect upon and improve their self-awareness and clinical performance, typically within the context of clinical supervision or continuing education (Vaachon, Durand, & LeBlanc, 2010; Fowler & Chevannes, 1998). So as not to muddy the waters, the following section will continue to use the term self-awareness to encompass both (a) conscious self-monitoring performed for the purpose of improving clinical skills and (b) the accuracy or inaccuracy with which clinical professionals perceive their clinical behavior and the effects of their clinical behavior in action.

Self-awareness is necessary for the SLP to understand his own influence in the therapeutic alliance, as well as to guide his interactions with the client. While SLPs may assume that they have an appropriate level of self-awareness based on their comprehensive training, the findings of some studies appear to indicate that some SLPs have inaccurate perceptions of themselves and their tactics. For example, Hand (2006) examined the effectiveness of SLPs as "information givers;" when the sessions of 12 SLPs with a client and caregiver were analyzed for information exchange, Hand (2006) discovered that (1) the SLPs in this study gave their clients few to no opportunity for negotiation or feedback throughout the session; (2) information exchange was more successful when clients were treated collaboratively rather than as passive recipients of the therapist's expertise; and (3) that "there was a sense that more information-giving from the clinician occurred with those who perhaps needed it the least" (p. 262).

It may be that conscious self-awareness is simply not in the forefront of the SLP therapeutic mindset. Instead, all available mental resources are devoted to the client and managing the client's symptoms. The SLP exerts control over the session content and style of discourse, thus controlling the amount of knowledge introduced and discussed within the session; the SLP also exerts control by dominating how the client's communication attempts and behavior are interpreted. This style of communication has been labeled a dominant interpretive framework (Damico & Damico, 1997), and while it may be a necessary approach to maintain control and accomplish an agenda, it can constrain the interactions, reduce the spontaneity of the SLP/client dyad, and requires little by way of therapist awareness of both how he is coming across *and* how his client is responding. The typical approach to "counseling" speech clientele illustrates this matter; counseling in speech pathology usually refers to an action done *to* the client with the intent of helping them understand and cope with a communication disorder, rather than an interactive engagement between the client and SLP (Hand, 2006; Geller & Foley, 2009). This sets up an imbalanced relationship between the SLP and client in which the SLP is dominant rather than a partner.

In some studies, therapist metacognitive skills have not been directly correlated to client outcomes (Stratton, 2006); however, they are indirectly related to outcomes through their role in establishing and maintaining a therapeutic alliance between the SLP and client (Davis, Eicher, & Lysaker, 2011). Medley and Powell (2010) described an approach to treatment, Motivational Interviewing (MI), that operates on the theoretical basis that impaired self-awareness decreases client participation in rehabilitation, and which encourages therapists to use non-confrontational, collaborative, and self-efficacious interactions with clients to facilitate their acceptance of deficits, self-regulation, and cooperative therapeutic alliance.

Geller and Foley (2009) suggested a relational and reflective model of cognitive-communicative rehabilitation focusing on establishment and maintenance of rapport between SLP and client in order to achieve desired treatment results. SLP self-awareness is the foundation of this model, illustrated in the promotion of broad techniques such as reflective functioning and transference-countertransference. Geller and Foley defined reflective functioning as the ability to self-monitor and detach from immediate experiences. This involves "integration of information, awareness across many developmental domains, and an understanding of self and self-other across emotional dimensions" (p. 9). Such reflective practice combats the urgency SLPs may feel to plow through goals without considering the concerns and latent emotional states of the client. SLPs must not only be analyzing, appraising, and adjusting their own work (p. 9), but also serving as a mirror for the client to maintain and adjust affective attunement. Affective attunement parallels the concept of transference-countertransference, in which the SLP responds to and understands both the overt behavior and affective expression of the client as well as the client's latent affective states that underlie his behavior and expression. Both reflective functioning and affective attunement require the SLP to have awareness of his own thoughts, behaviors, and feelings towards the client and an understanding of how they impact the therapeutic relationship.

Communicative behaviors and therapist self-awareness. SLP self-awareness of techniques and behaviors exhibited during a session are crucial to eliciting desired client reactions and establishing a therapeutic alliance. Indeed, Horvath and Greenberg (1989) related therapeutic bond to the demonstration of positive regard, empathy, and congruence toward a client via the therapist's nonverbal gestures and verbal behaviors. During and following an SLP's interactions with a client, he must be aware of how the client is interpreting his communication, how the client is responding, how effective or ineffective his communicative behavior was in accomplishing its

intent, and how to adjust his behavior to achieve the desired outcome. These aspects of behavior, intent, result, and adjustment are reflections of therapist self-awareness.

Communicative behaviors and intent. A communicative act, or communicative behavior, is operationally defined as a concrete verbal or nonverbal behavior that overtly or covertly communicates something to a partner (Plunze, 2010; Huang & Wu, 2012). Verbal behaviors can have several operational modes; Hill and O'Grady (1985) profiled common verbal response modes to include approval/reassurance, provision of information, direct guidance, closed question, open question, restatement, reflection, interpretation, confrontation, and self-disclosure. Poletto (2009) categorized verbal communicative behaviors as focusing dialogue, encouragement, summarization, questioning, confrontation, reflection of meaning, self-disclosure, and active listening. Nonverbal communicative behaviors may include facial expressions, eye contact, tone of voice (e.g. rate of speech, spacing of words, pitch, volume, and pauses), posture and gestures, attending behavior, empathy (e.g. listening intensity, context, selective responding) (Poletto, 2009; Hill, Siegelman, Gronsky, Sturniolo, & Fretz, 1981). Any combination of such behaviors can be used to facilitate client behavior or collaborate with the client; Bachelor (1995) described facilitative behaviors as portraying a nonjudgmental attitude toward the client, listening attentively, and showing understanding; while collaborative behaviors included helping client recognize alternative interpretations of environmental or interpersonal interactions.

Selecting a communicative behavior (verbal or nonverbal) to accomplish an intent is mediated by, among other things, the client's behaviors and reactions. Therapists must very quickly assimilate an enormous amount of data (e.g. client dynamics, diagnoses, observations, setting, specific tasks) and relate it to existing knowledge. This assimilation produces an intent within the therapist to accomplish a goal within session; this intent then guides the therapist's

behavioral, communicative response (Hill & O'Grady, 1985). Stiles (1992) created a taxonomy of eight verbal response modes linked with intent, including the following: 1) reflection, with the intent of putting others' experiences into words (e.g. repeat, restate, clarify); 2) acknowledgment, with the intent of conveying receptiveness (e.g. simple acceptance, salutations); 3) interpretation, with the intent of explaining or labeling (e.g. judgements on the other's experience or behavior); 4) question, with the intent to require information or guidance; 5) confirmation, with the intent of comparing experiences (e.g. agreeing, disagreeing, sharing experiences); 6) edification, with the intent to state objective information; 7) advisement, with the intent of attempting to guide behavior (e.g. suggestions, prohibition, commands); and 8) disclosure, with the intent of revealing personal thoughts, intentions, or perceptions. Different nonverbal behaviors have been associated with specific intents (Mehrabian, 1968; Hill & O'Grady, 1985; e.g. following a traumatic event, a therapist intending to show support may lean forward and nod while the client tells his story), although the interpretation of that behavior from the observer or addressee will vary based on context, rapport, gender, and other factors (Brugel, Postma-Nilsenová, & Tates, 2015; Mast, 2007).

Hill and O'Grady (1985) distinguished between response mode and intention of response, and developed The Intentions List to characterize the immediate intents behind a therapist's behavior in session. While the list was developed after extensive observation of professionals in the field of psychology, the authors purposefully worded the designated intent categories such that they could be applied across all forms of therapy, with therapists from different theoretical orientation, in different settings. Nineteen nonmutually exclusive categories of intent are included in The Intentions List: relationship (e.g. conflict resolution), change, reinforce change, give information, get information, hope (e.g. restore morale), cognitions (e.g. identify illogical thoughts), behaviors (e.g. give feedback on client behavior), set limits, focus, clarify, self-control

(e.g. empower client), feelings, insight, resistance, challenge, support, cathart, and therapist needs (e.g. to protect or self-defend).

Kivlighan (1990) used a modified version of The Intentions List to examine the relationship between therapist intent and client-rated working alliance. The original 19 categories were condensed into seven clusters in the modified version: assess (get information, focus, and clarify), educate (give information), change, set limits, explore (feelings, cognitions, and behaviors), restructure (resistance, challenge, insight), and support (hope, reinforce change). When therapists reviewed videos of their clinical interactions and rated the intent behind each of their speaking turns, the findings of the results were that therapist intentions accounted for a moderate proportion of variance in the client-rated therapeutic alliance when pre-therapy attitudes of the client were factored into analysis. Interestingly, the intentions of explore, assess, and support were found to be negatively associated to the perceived working alliance; in other words, greater use of these intentions were correlated to weaker working alliance. Kivlighan theorized that this could be due, respectively, to the actualization of these intents in therapy, a focus on personal aspects that the client was not ready to address, or causing a shift to passivity on the part of the client rather than active collaboration.

Assessing therapist self-awareness. There are very few available assessments of therapist self-awareness, and none with clear application to a therapist's manifested communicative behaviors in a clinical environment. In creating those that exist, most authors (a) assume "normality" of those being assessed, thus focusing on characterizing normal self-awareness and its effect on work competency or productivity (e.g. The Self-Awareness Outcomes Questionnaire [Sutton, 2016]); (b) measure the extent to which an individual self-reflects or the importance that he attaches to self-reflection (e.g. Reflection Rumination Questionnaire [Trapnell & Campbell,

1999]; and Self-Reflection and Insight Scale [Grant, Franklin, & Langford, 2002]); or (c) look specifically at therapist awareness within session, but only weakly apply or correlate these data to concrete behaviors that may be elicited during therapeutic interactions. For example, in The Self-Awareness and Management Strategy Survey (Williams, Hurley, O'Brien, & de Gregorio, 2003), therapists retrospectively rate their awareness across a whole therapy session on a Likert-style scale; yet, examples of self-awareness are included such as "noticing that you have started to sweat," or "noticing that you feel bored." Little insight into therapist communicative behaviors could be gained from these examples of self-awareness, much less into how they may be correlated with the therapeutic alliance. Other assessments are focused on mindfulness; for example, the Mindful Attention Awareness Scale (Brown & Ryan, 2003) is used to examine a person's attention and awareness to his present environment, but scale items are mostly inappropriate for measuring in-session communicative behavioral manifestations of self-awareness (e.g. one test item states "I break or spill things because of carelessness…"). Other measures of therapist mindfulness are focused on techniques of meditation or breathing exercises to treat psychiatric disorders such as depression or anxiety (Hofmann, Sawyer, Witt, & Oh, 2010). Finally, researchers who specifically examine therapist behaviors or communication style, particularly in the field of speech-language pathology, often use external raters to classify a therapist's communicative behaviors or verbal responses into set categories without requiring any measure of self-awareness from the therapist, such as prediction or reflection of his techniques.

Summary of the Literature and Justification for Research Study

Self-awareness is a broad construct involving the recognition of one's strengths and weaknesses and their relative impact on daily activities. As depicted in the model of Toglia and Kirk (2000), awareness operates independently of, but interactively with, cognitive modalities. On

this account, awareness supports an individual's ability to accept and compensate for cognitive deficits. Impaired self-awareness commonly occurs after TBI and has negative ramifications for treatment outcome and societal reintegration, but there is evidence that self-awareness can improve with direct or indirect treatment. Self-awareness is also necessary for SLPs working with TBI clientele, as it underlies the selection of therapeutic techniques and supports communicative behaviors necessary for building and maintaining a strong clinician-client relationship. Unfortunately, an adequate measure of therapist self-awareness that can be used for SLPs providing cognitive-communicative rehabilitation and that is associated with in-session communicative behaviors does not exist at this time.

The relationship between therapist self-awareness, client self-awareness, and therapeutic alliance is rarely examined empirically, despite the fact that each of these factors has been investigated within the field of speech-language pathology and independently associated with treatment outcomes. In addition, the type and frequency of SLP communicative behaviors has not been examined in relation to the client perception of therapeutic alliance and the self-awareness of both the client and the SLP in any known studies. The aim of the current study is to examine the relationship between self-awareness and therapeutic alliance in TBI client-SLP dyads during a collaborative therapy task. The following research questions will be addressed:

1. Are the SLPs aware of the communicative behaviors they manifest towards individual clients in-session?
    - H_0: SLPs are not aware of the communicative behaviors they manifest towards individual clients in-session.
    - H_1: SLPs are partially aware of the communicative behaviors they manifest towards individual clients in-session.

2. Is client and SLP self-awareness related to the strength of therapeutic alliance?
    - H_0: Client and SLP self-awareness are not related to the strength of the therapeutic alliance.
    - H_1: Both client and SLP self-awareness are related to the strength of the therapeutic alliance.
3. Are the communicative behaviors exhibited by the SLPs related to the client's perception of therapeutic alliance?
    - H_0: Communicative behaviors are not related to the client's perception of therapeutic alliance.
    - H_1: Some communicative behaviors are related to the client's perception of therapeutic alliance.
4. Are the communicative behaviors exhibited by the SLPs related to the client's self-awareness?
    - H_0: Communicative behaviors are not related to the client's self-awareness.
    - H_1: Some communicative behaviors are related to the client's self-awareness.
5. What in-session factors are reported by the SLPs or observed by the researcher as having some effect on SLP behavior during the treatment session?

CHAPTER 3: METHODOLOGY

The goal of this study was to examine the relationship between therapist self-awareness, client self-awareness, and therapeutic alliance. An understanding of this relationship would have a significant impact on SLP provision of cognitive-communicative rehabilitation to individuals with TBI. Therefore, the nature of this relationship, as well as the practical manifestations of self-awareness demonstrated by the SLPs through their communicative behaviors, was investigated in this study.

Participants

Participants included 20 SLP-client dyads; however, Dyad 2 was omitted from analysis following the client's voluntary withdrawal from the research activities, leaving a total of 19 participant dyads for data analysis. Participants were recruited from counties in Michigan, including Macomb, Wayne, Oakland, Jackson, Lenawee, Livingston, Monroe, Sanilac, Ingham, St. Clair, and Washtenaw. Participant recruitment was achieved by first enrolling SLPs, who were recruited through word of mouth and social media platforms. Recruited SLPs signed a letter of informed consent, then identified adult TBI clients from their caseload who met the eligibility criteria (listed below) for TBI participants.

SLP participants included 18 females and 1 male (N = 19); the mean age of participants was 40.79 years (*SD* = 13.23). All but one SLP participant had achieved their certificate of clinical competence (CCC-SLP) from the American Speech-Language-Hearing Association (ASHA); the one exception was a clinical fellow. The mean years of experience represented by the SLPs was 14.45 (*SD* = 13.50). SLP participants were currently providing treatment services, as defined in ASHA's scope of practice, to TBI clientele for a minimum of 10 hours a week at any facility regardless of practice setting. All SLPs had conducted at least 100 hours of rehabilitative therapy

services relevant to the treatment of acquired cognitive-communicative disorders. Additionally, all had treated their participating client for at least three treatment sessions.

Referrals for TBI participants were obtained from participating SLPs following their detailed review with the researcher of the study topic and procedures, and the inclusionary/exclusionary criteria for potential TBI participants. The SLP was asked to use his clinical expertise to preemptively evaluate whether any of his TBI clientele would be good candidates for participation in this study (i.e. meet all criteria and be competent/able to complete all assessments and the research task).

Once referred by his SLP, informed consent was obtained from the potential TBI participant or his legal authorized representative (LAR). If a potential TBI participant was his own legal guardian he was considered competent to voluntarily consent, in writing, to participate in this research study following both a verbal and written review of the study with the researcher. If the potential TBI participant was not his own legal guardian, his LAR would provide written informed consent following both a verbal and written review of the study with the researcher; then, the same method was used to approach and gain consent from the potential TBI participant.

TBI client participants were adults ages 18 to 65 enrolled in cognitive-communicative rehabilitation services. They were recruited from inpatient and outpatient clinics and rehabilitation centers across Michigan following referral from recruited SLPs and the completion of informed consent procedures. Because the TBI participants were already enrolled in a rehabilitation program, most demographic information was taken from their medical records. Demographic information included sex, age, educational level, ethnicity, length of time from the date of injury (DOI) to rehabilitation admission, length of admission in the current rehabilitation program, length of time post-injury, initial Glasgow Coma Scale score (when available), and current enrollment in

other therapies. Additionally, information was collected on the length of time each dyad of participants had been working together in therapy.

TBI clients had received therapy services from the referring SLP for a minimum of three treatment sessions, not including assessment sessions. Client participants included 11 males and 8 females (N = 19). The mean age of client participants was 42.74 years (*SD* = 14.09). All TBI clients had diagnoses of mild to severe traumatic brain injury objectively documented through neuroimaging, their most recent neuropsychological evaluation, and/or an initial Glasgow Coma Scale score of 13 or less following the traumatic injury; diagnoses were verified during a review of the client's medical chart with the participating SLP. Each client's participating SLP was asked to use his clinical expertise to judge the client's level of overall cognitive-communicative impairment at the time of this study; impairment severity was classified as borderline or mildly impaired (*n* = 5), mild-moderately impaired (*n* = 6), moderately impaired (*n* = 5), moderate-severe or severely impaired (*n* = 3). Although data was not specifically gathered or analyzed with respect to client physical deficits, it is worth nothing that ten of the nineteen client participants in this study were observed to use canes, walkers, or wheelchairs. TBI clients represented a range of education levels: partial completion of high school (*n* = 4), high school (*n* = 5), partial completion of college (*n* = 3), and a four-year college degree and/or post-graduate work (*n* = 7). The number of speech treatment sessions completed by the clients with their participating SLP ranged from 14 to 520 sessions (*M* = 131.58, *SD* = 143.93). Time post-injury ranged from 3.50 to 500.20 months (*M* = 73.39, *SD* = 119.57). The interim period from DOIs to admission in their current rehabilitation program ranged from .70 to 493.80 months (*M* = 58.29, *SD* = 118.51). Length of enrollment in their current rehabilitation program ranged from 8.00 months to 47.70 months (*M* = 15.10, *SD* = 13.81).

No TBI participants were excluded based on length of time post injury, provided they had been discharged from acute care. Inclusion of a range of severity levels created a varied sample; although this may have caused statistical heterogeneity [i.e. observed effects being more different between participants than what might be expected from chance (random error) alone], the diversity was desirable as it more accurately represented the clinical diversity faced by SLPs working with TBI. No participants were excluded based on the presence of comorbid language or psychiatric disorders, educational level, or gender. Participants were excluded if they had a known history of alcohol or drug abuse or a prior acquired brain injury documented in their medical history (e.g. stroke, concussion, tumor).

No sociodemographic characteristics of any participant precluded involvement in the study; however, SLPs were required to be English-speaking and able to conduct the clinical trial in English. TBI participants who spoke a first language other than English were included in this study; however, they were required to be fluent in English such that they were able to provide written informed consent (either through an appropriate proxy or directly), participate in auditory-verbal exchange of information in English, complete baseline assessments in English, and engage in a collaborative therapeutic task in English.

Procedure

The procedure for data collection included three parts: first, the assessments of self-awareness and therapeutic alliance; second, the completion of a video-taped therapy task; and third, a post-task video review conducted by the researcher with the participating SLP. Collected data included the responses to the Awareness Questionnaire (AQ; Sherer et al., 1995), the short revised version of the Working Alliance Inventory (WAI:SR; Tracey & Kokotovitc, 1989; Horvath & Greenberg, 1989), a study-specific Prediction and Reflection Questionnaire, a study-specific

Self-Evaluation form, and descriptive field notes which were taken by the researcher throughout all research activities for each dyad.

At session onset, SLP participants met with the researcher to complete a practice trial of the collaborative task. Following the practice trial, SLPs completed all baseline assessments. Then, TBI participants entered the therapy office and the SLP was asked to briefly exit the therapy office while the TBI client completed his/her baseline assessments independently from the SLP. Baseline assessments included the WAI:SR, a clinician-client rating scale describing the perceived strength of their therapeutic alliance, and the AQ, a measure of the TBI client's general level of self-awareness. In addition, the SLP completed a three-item Prediction Questionnaire designed for the study that required him/her to (a) predict whether he/she will communicate in predominantly verbal or nonverbal modes and (b) rate the estimated frequency with which he/she will use specific types of verbal and nonverbal behaviors.

If the TBI client's existing cognitive-communicative deficits prevented independent completion of his assessments, the researcher provided assistance as needed to support his abilities. For example, if a client requested help with reading a question or if a client took longer than two minutes to read through and respond to the first question on either assessment, the researcher offered to read the questions aloud. If the client continued to have difficulty with understanding or responding to any question even after it was read aloud, the researcher would also paraphrase the question, provide an example (if applicable), break the question into parts, and/or supplement her speech with gestures to support the client's understanding. With these supports provided as needed, all clients were able to complete the questionnaires and provide responses that appeared to reflect their understanding of the assessments' questions.

Dyads of participants completed a short collaborative task consisting of a simple card game, described in Appendix A. The task was novel to all participants. The researcher controlled the game play by stacking the deck such that a specific series of card events would occur. In doing this, the researcher created a structured task that would be replicated for all dyads in the study and allowed the researcher to anticipate reactions and/or behaviors of the participants relative to a specific series of card events.

The game was selected for several reasons. First, the skills required of the TBI participants during this task could have been elicited during a typical therapy session and related to pre-existing cognitive-communicative goals, such that participation in the study would not have disrupted the flow of treatment. Primary skills required for this task included speed and accuracy of information processing (e.g. listening to and/or reading the directions for the game; observing a series of cards and acting on the instructions for that series), attention (e.g. attending to which cards were laid or series of cards), working memory (e.g. retaining instructions during game play), and online self-awareness for cognitive performance (e.g. recognizing when incorrect plays were made; modifying actions based on error recognition).

Second, the game was simple and relatively easy to learn for both members of the dyad. A minimally difficult task was hoped to reduce the cognitive burden felt by the participants; this may have allowed more social interactions or therapeutic discussion to take place within the controlled condition. In addition, this may have provided more opportunity for both members of the dyad to exhibit self-awareness socially, as manifested by error recognition and correction on the part of the client and communicative behaviors such as general encouragement or cueing on the part of the SLP.

The interaction between the dyads was videotaped. Video began at the onset of session and ended when the SLP closed the collaborative task. This took a minimum of five minutes and a maximum of 15 minutes. If the participants had not concluded the task at the 15-minute mark, an auditory cue (i.e. a knock on the door) was issued to cue the SLP to wrap up the task, even if the entire game had not been finished. The primary purpose of this video was to capture the semi-structured social and therapeutic interaction between the client and the SLP; each video was then used for further data collection during a post-task process recall.

As much as was possible, the facial expressions and body language (from the waist up) of both the SLP and the TBI clients during the collaborative task were captured in the video. The content of the video was expected to contain three stages of interactions within the session. These were Stage 1: "Greetings and Introduction;" Stage 2: "Collaborative Task;" and Stage 3: "Reflection." It was hypothesized that within each stage the SLP would have smaller "microgoals," defined as specific intentions for the client-SLP interaction. Prior to data collection, the researcher identified the set of presumed microgoals and refined them based on information from five certified SLPs blinded to the study who were asked to independently identify what their microgoals for a similar therapy session would be. Microgoals for Stage 1 included the following: (1) greeting, (2) establishing rapport/social commenting (e.g. "How was traffic?"), (3) explaining purpose of session, (4) introduction of the task, and (5) describing the rational or therapy goal. One or multiple communicative behaviors were predicted to occur to achieve each microgoal. For example, to achieve the microgoal of greeting the client, the SLP may have stood, extended a hand, said "hello, how are you?," smiled, and offered a seat to the client. Stage 2 microgoals included: (1) explanation of the task rules, (2) ascertaining understanding from the client, (3) beginning game, (4) eliciting client communication or participation, (5) providing cueing, (6) communicating

support/reinforcement, (7) clarifying rules (as needed), (8) making social comments (e.g. “You’ve got better cards than I do!”), (9) ensuring client is tolerating task, and (10) indicating the end of the activity. For example, to achieve the microgoal of beginning the game, the SLP may have picked up his/her deck of cards, leaned forward in his/her chair, and asked “Are you ready to play?” In this stage, it was possible that a microgoal occurred one or more times; for example, cueing could have occurred throughout the game. Stage 3 microgoals included: (1) modeling a reflection of the activity, (2) requesting client perspective on the activity, (3) responding to the client’s perspective, (4) recapping the client’s performance, (5) supporting the communication attempts of the client, and (6) transitioning to the end of session. For example, to transition to the end of session, the SLP may have gathered up the cards, said “all done!,” and leaned back in his/her chair. When Stage 3 concluded, the video was turned off.

A review of each videotaped interaction was conducted with the respective SLP within three hours of task completion. The decision to restrict the review to within the immediate 24 hours post-task was based on the work of Hill and O’Grady (1985), who warned that delaying the review for a longer period of time may increase the likelihood that memory decay or intrusions would confound the review process and affect the reliability of each therapist’s respective review. This was particularly important as the covert nature of momentary self-awareness, or any internal process, requires evaluation by self-ratings and prevents direct measurement by an external rater in the moment of an individual’s behavior (Kivlighan, 1990).

The post-task video review required the researcher and each SLP to jointly watch his/her videotaped task. The role of the researcher during observation of the audio-videotape was two-fold. First, the researcher tallied the occurrence (or absence) of verbal and nonverbal behaviors within each microgoal for each SLP. Second, the researcher identified the occurrence of the

hypothesized microgoals within the interaction. When clusters of behaviors appeared to indicate that a predetermined microgoal had been achieved, the researcher stopped the videotape, rewound, and played the behavior a second time for the SLP to review. Cohen's κ was run to determine the strength of interrater agreement between the researcher and an external rater on the categorization of clusters of behavior as specific microgoals in 35% of the videos (Hallgren, 2012). The external rater and researcher came to a strong agreement, $\kappa = +.83$, $p < .0005$. Procedures for reaching interrater reliability were adapted from the nominal group consensus method described in James and Warren-Froward (2015). The external rater was trained on two videos until reaching at least 65% consistency with the researcher. Following training, the external rater independently categorized clusters of behavior as one of the 21 hypothesized microgoals. The external rater and researcher then met to discuss their categorizations and reach a consensus on any mismatched scores.

During the video review, the SLP's role was to complete a three-item Self-Evaluation form. Each SLP completed the Self-Evaluation form at every point a microgoal was perceived by the researcher; therefore, the number of times the form was completed varied for each SLP depending on his behavior. On this Self-Evaluation, the SLP: (1) rated his momentary self-awareness during the communicative behavior(s) he exhibited for each microgoal; (2) selected the intent which drove the behavior(s) from a list of eight options (adopted from the work of Stiles [1992]); and (3) selected the perceived reason that this behavior(s) was necessary in that moment from a list of eight options generated for this study. For purposes of this study, the video was paused and a Self-Evaluation form was completed only for the first time a microgoal was observed. This procedure was followed even when SLPs were observed to repeatedly perform a microgoal (e.g. "provide cueing," "social comments") throughout their session.

Finally, at the conclusion of each SLP's review of his behaviors, he was presented with a Reflection questionnaire, which was the parallel form to the Prediction Questionnaire completed during baseline assessments. On this form, the SLP reflected on his actual, rather than predicted, performance.

Measures

Therapeutic alliance. To measure the strength of the client-clinician relationship, all participants completed the revised short form of the Working Alliance Inventory (WAI:SR; Hatcher & Gillaspy, 2006; Horvath & Greenberg, 1989; see Appendix B). The WAI:SR divides into three subsections, Bond, Task, and Goal (Bordin, 1979), and consists of twelve statements describing the nature and state of the clinician and client relationship. Participants rate the truth of each statement on a 5-point Likert scale ranging from 0 (*not at all true*) to 5 (*very much true*); a higher score indicates a stronger therapeutic alliance. The WAI:SR is widely used in research studies examining therapeutic alliance in psychotherapy and has high reliability and validity across multiple patient populations, including TBI (Munder, Wilmers, Leonhart, Linster, & Barth, 2010; Paap & Dijkstra, 2017). The short form of the WAI has comparable reliability and validity to the full WAI (Munder et al., 2010; Busseri & Tyler, 2003), making it an appropriate choice for a time-constrained research experiment.

Awareness: Client. The Awareness Questionnaire (AQ; Sherer et al., 1995; see Appendix C) was used to quantitatively measure the client's level of self-awareness. The AQ is a self-other rating form (therapist-client) from which discrepancy scores can be generated. It consists of 17 questions on a 5-point Likert scale ranging from 1 (*much worse*) to 5 (*much better*) which assess the client's degree of awareness on three factors: cognitive, behavioral/affective, and motor/sensory functioning after traumatic brain injury. The AQ has high psychometric properties

(Sherer et al., 1995) and is commonly used when assessing impaired self-awareness after traumatic brain injury (Sherer et al., 1998).

Awareness: SLP. SLP self-awareness was measured in two ways. First, SLPs completed a three item Self-Evaluation for every microgoal identified during their post-task process recall, on which they retrospectively rated (1) their momentary self-awareness during the behavior of each microgoal, (2) their intention driving that behavior, and (3) the perceived need of the behaviors (see Appendix D). For Item 1: Momentary Self-Awareness of this form, SLPs completed a modified version of The Therapist Momentary States of Self-Awareness (Williams, 2003), reduced to a 5-point Likert-style scale ranging from 1 (*not at all aware of self*) to 5 (*extremely aware of self*). Momentary self-awareness is distinguished from a broader sense of self-knowledge. No information on the psychometric properties of this scale is available at this time. For Item 2: Intent, SLPs selected one intent per microgoal from options derived from the taxonomy of Stiles (1992). Intents included (1) put other's experiences into words (e.g. repeat, restate, clarify); (2) convey receptiveness (e.g. simple acceptance, salutations); (3) explain, judge, or label the other's experience or behavior; (4) provide information or guidance; (5) compare experiences (e.g. agreeing, disagreeing, sharing experiences); (6) state objective information; (7) attempt to guide behavior (e.g. cues and prompts, suggestions, prohibition, commands); and (8) reveal personal thoughts, intentions, or perceptions. Although Stile's (1992) original taxonomy, in which intent is related to types of verbal response modes, has good reliability and validity, this list of intents has not yet been studied as a reflection of therapist awareness. On Item 3: Perceived Need, the list of response options were split into two sections of perceived need: client expression or therapist impression. SLPs were required to pick one response from each section to fully respond to this item. Reasons classified as client expression included (a) client manifests negative affect (e.g.

frustration, anger); (b) client requests help or clarification; (c) client appears uneasy or nervous; or (d) none of the above. Reasons classified under therapist impression include: (a) therapist feels the client requires clarification even without a direct request; (b) therapist feels the client has or is about to reach a point of bewilderment; (c) therapist wants to put the client at ease; or (d) none of the above.

Second, SLP self-awareness was measured via prediction and reflection discrepancy scores on the Prediction and Reflection questionnaire (see Appendix E). The Prediction form was provided at session onset. Its questions required the therapist to predict his primary communication modality (verbal, nonverbal, or about the same of both) and to rate the expected frequency of specific verbal communicative behaviors and nonverbal communicative behaviors on a 7-point Likert scale ranging from 1 (*never*) to 7 (*every time*). Upon review of video-taped task, the SLP reflected on his communication and completed the parallel Reflection form. Verbal behaviors included those defined by Stiles (1992): reflection, acknowledgment, interpretation, question, confirmation, edification, advisement, and disclosure. The list of nonverbal behaviors was adapted from those included in Poletto (2009) and Hill and colleagues (1981): facial expressions, eye contact, pauses, posture and gestures, attending behavior, empathy.

Communicative behavior. The type of communicative behaviors (verbal, nonverbal, or both) were tracked by the researcher during the post-task videotape review. The researcher tallied the occurrence of each type for each microgoal.

Data Analysis

A mixed method, correlational research design was used to explore the relationship between client self-awareness, therapeutic alliance, and therapist self-awareness as demonstrated by communicative behaviors. Confounding variables to the data analysis included compromised

assessment procedures due to participant characteristics (e.g. client fatigue or irritability of client causing discontinuation of assessment); the researcher recorded such extraneous variables and factored them into the analysis of the data if applicable. The data for each focal variable was converted to Z scores to identify univariate outliers greater or less than +/-2.58 (alpha of .01); any data point identified as an outlier was changed to the next most extreme, but non-outlier, data point. Skewness and kurtosis for all focal variables were then assessed, using the raw data for variables with no outliers and the adjusted data for variables with outliers. Several variables were identified as either skewed or kurtotic at an alpha of .01; these are described below in the Results section. Because of the significant skew or kurtosis, appropriate nonparametric measures (e.g. Spearman rho, Mann-Whitney U) were selected to analyze these variables. The use of nonparametric measures were preferred in this case, rather than transforming the data, as transforming the data can make the interpretation of results unnecessarily difficult. All statistical analyses used an alpha of .05 to determine significance. Research questions were analyzed in the following ways.

1. Are therapists aware of the communicative behaviors they manifest in-session?

This question was answered via analysis of the three item Prediction and Reflection questionnaire. For the first item of the questionnaire, the SLP predicted then reflected on his predominate mode of communication (verbal, nonverbal, or about the same of both) during the collaborative task. An overall percentage of SLPs who responded consistently to the first item across the Prediction and Reflection forms was calculated using an exact match approach. For the second item of the questionnaire, the SLPs ranked on a 7-point Likert scale the expected (prediction) and actual (reflection) frequencies with which they used each of eight verbal behaviors (adapted from Stiles, 1992). SLPs used the same scales to rank the expected and actual frequencies

of six nonverbal behaviors (adapted from Poletto, 2009; Hill et al., 1981) for the third item of the questionnaire. A percentage of response consistency was calculated for each SLP for items two and three across the Prediction and Reflection forms using a +/- 1 binning method; in other words, if responses on the Reflection form were within +/- 1 to the corresponding response on the Prediction form, the responses were marked as a match. A higher percentage indicated stronger agreement between prediction and reflection. It was hypothesized that strength of agreement was positively correlated to degree of self-awareness. SLPs were then grouped as 1: "more consistent" or 0: "less consistent" according to a median split of the percentages of response consistency, wherein scores greater than or equal to the median were marked as 1, and scores less than the median were marked as 0. These groups were used in later analyses.

This question was also answered through analysis of items two and three of the Self-Evaluation form. (Item one of this form is used for analysis under research question two, below.) On Item 2: Intent of the Self-Evaluation, the SLP selected an option which best reflected the intent behind his behaviors out of a list of eight (Stiles, 1992). On Item 3: Perceived Need of the Self-Evaluation, the SLP selected the option which best reflected the perceived need for the behaviors. Qualitative analyses were performed to identify and interpret patterns in the responses of items two and three, and descriptive statistics described the frequency of types of intent and perceived need for each SLP and across all SLPs. The mean frequencies of each response option were derived by first summing the relative frequencies for that option across SLPs, then dividing that sum by the sum number of microgoals observed across all SLPs (n = 262).

2. Is client and SLP self-awareness related to the strength of therapeutic alliance?

This question examined two relationships: client self-awareness and therapeutic alliance, and SLP self-awareness and therapeutic alliance. Therapeutic alliance was measured via client

ratings of the WAI:SR. An average scale score was computed; a higher score indicated a stronger therapeutic alliance. Client awareness was measured via the discrepancy scores between the client and SLP versions of the AQ. For the AQ, the discrepancy between each client and SLP ratings were calculated by subtracting the total score of the SLP from the total score of the client. Positive discrepancies indicated the client over-estimated his self-awareness; negative discrepancies indicated he under-estimated. Discrepancy scores were calculated for the total AQ as well as its three subsections: cognitive, behavioral/affective, and motor/sensory. For all statistical analyses of the AQ, the absolute values of the discrepancy scores were used. In other words, the negative values were inversed such that all values were positive. This was necessary for analysis as a greater absolute score on this measure, either positive or negative, indicated a greater impairment in the client's self-awareness.

SLP self-awareness was measured in two ways; first, through their response consistency across the Prediction and Reflection forms (described under the first research question); and second, through their rankings on Item 1: Momentary Self-awareness of the Self-Evaluation form. For the latter, each SLP watched a video of his session and reviewed behaviors he exhibited for each microgoal; then, he rated on a 5-point Likert scale his momentary self-awareness for those behaviors. An average self-awareness ranking was computed for each SLP.

Subsequent analyses were conducted using these measures. SLP self-awareness and therapeutic alliance were examined by comparing the Prediction and Reflection questionnaire to the client scores on the WAI:SR. First, a two sample t-test was used to test the differences between the two groups of SLPs (more consistent and less consistent) on the average scale scores of the total WAI:SR. Second, a two sample t-test was used to test the differences between the two groups of SLPs and the average scale scores of each of the three subsections of the WAI:SR. Third, a two

sample t-test was used to test the correlation between the two groups of SLPs and the average scores on the momentary self-awareness rankings (item one) of the Self-Evaluation form. Client self-awareness and therapeutic alliance were measured using a Pearson's *r* to test the correlation between the discrepancy scores of the AQ and its subsections and the client scores on the three subsections of the WAI:SR.

3. Are the communicative behaviors exhibited by the SLPs related to the client's perception of therapeutic alliance?

For each observed microgoal captured during the video review, the researcher tallied whether or not the SLP used verbal behaviors (indicated with a + or -), nonverbal behaviors (indicated with + or -), or both (indicated with + or -). Relative frequencies for each response type were generated for each SLP by totaling the occurrence of each type and dividing the totals by the number of observed microgoals for that SLP. These frequencies were then summed across SLPs and divided by the total number of observed microgoals to generate an average frequency for each response type. Then, a Pearson's *r* was used to test the relationship between the average frequencies of each response type and the average scale scores of the WAI:SR and its subsections. Additionally, a Pearson's *r* was used to test the relationship between the average frequencies of Item 2: Intent of the Self-Evaluation form and the WAI:SR average scale scores.

4. Are the types of communicative behaviors exhibited by the SLPs related to the client's self-awareness?

A Pearson's *r* tested the relationship between the average frequencies of each response type (verbal, nonverbal, and both) and the discrepancy scores of the AQ.

5. What in-session factors are reported by the SLPs or observed by the researcher as having some effect on SLP behavior during the treatment session?

Qualitative methods were used to observe and record the SLPs' behavior relative to their individual clients throughout the research activities. The researcher took descriptive field notes documenting participant comments and interactions; participants' comments were transcribed verbatim when possible throughout the baseline assessments and post-task video review, and descriptive notes were made of participant behavior and interactions during the research game. After the completion of data collection, inductive analyses were used to collectively review the field observations and generate theories on SLP behavior relative to therapeutic alliance and self-awareness. Additionally, results of the qualitative analyses were related to one or more of the first four research questions. The theoretical implications of these findings are discussed in the Discussion section with respect to future research, overall knowledge, and clinical practice in the field of speech-language pathology.

CHAPTER 4: RESULTS

This study used a mixed methods approach to examine the relationship between therapeutic alliance and self-awareness of individuals with brain injury and their SLPs. The data obtained are presented below with respect to the research questions described in Chapter Two.

A complete correlation matrix between all variables is provided in Tables 12, 12.1, and 12.2. The matrix was broken apart into separate, smaller tables to eliminate extraneous correlations (e.g. correlations between subtests or factors of the same assessment); the text refers to these smaller tables for ease of understanding.

Research Questions

Research Question 1. Are therapists aware of the communicative behaviors they manifest in-session?

On the first item of the Prediction/Reflection questionnaire, SLP participants were asked to mark their primary communication modality (verbal, nonverbal, or equally both). One SLP left this item blank; the remaining SLP participants (n = 18) predicted their primary communication modality with 66% accuracy. The median percentage of consistency with which all SLPs responded to items two and three across the Prediction and Reflection forms was 71%. Individual percentages of response consistency and each SLPs group are listed in Table 1.

For Item 1: Momentary Self-Awareness of the Self-Evaluation form, SLPs rated their momentary self-awareness for each microgoal on a Likert-style scale ranging from 1 (*not at all aware*) to 5 (*extremely aware*). The average rank score of momentary self-awareness for each SLP is provided in Table 1. The average frequency of each Likert rank across SLPs is as follows: 5 (*extremely aware*) at 52%; 4 (*moderately aware*) at 26%; 3 (*somewhat aware*) at 14%; 2 (*slightly aware*) at 4%; and 1 (*not at all aware*) at 3%.

Table 1
Response Consistency and Average Rank Score on the Prediction and Reflection Forms

SLP	% response consistency	Group	Average Rank Score on Item One: Momentary Self-Awareness
S1	0.71	1	2.45
S3	0.50	0	3.76
S4	0.64	0	5.00
S5	0.93	1	4.44
S6	0.64	0	4.71
S7	0.64	0	3.64
S8	0.57	0	5.00
S9	0.86	1	3.93
S10	0.29	0	5.00
S11	0.79	1	3.53
S12	0.79	1	4.31
S13	0.57	0	3.14
S14	0.79	1	5.00
S15	0.93	1	4.94
S16	0.86	1	5.00
S17	1.00	1	3.85
S18	0.71	1	3.54
S19	0.64	0	4.13
S20	0.43	0	4.62
Median	0.71	*M*	4.21
		SD	0.75

Note: Percentage response consistency reflects items 2a through 3f of the Prediction/Reflection forms and was calculated using a binning method (+/- 1) across forms. SLPs were divided into two groups (“1” = more consistent, "0" = less consistent) using a median split of the response consistency percentages. Average rank scores of item 1 of the Prediction/Reflection forms were calculated by summing the Likert rating of each SLP on each observed microgoal during the post-task video review, then dividing it by the number of observed microgoals for each SLP.

Research Question 2. Is client and SLP self-awareness related to the strength of therapeutic alliance?

No significant correlations were found between the discrepancy scores of each factor on the AQ and the average scale scores of the WAI:SR and its subsections; the results of correlation statistics conducted between these variables are listed in Table 2.

Table 2
Correlation Statistics between AQ discrepancy scores and WAI:SR

	AQ Total discrepancy	AQ Cognitive discrepancy score	AQ Behavioral/affective discrepancy score	AQ Motor/sensory discrepancy score[a]	*M*	*SD*
WAI:SR Total average scale score	0.06	0.18	-0.27	0.08	4.40	0.72
WAI:SR Task average scale score[a]	0.04	0.08	-0.23	-0.01	4.16	0.95
WAI:SR Goal average scale score	0.09	0.20	-0.20	0.25	4.34	0.94
WAI:SR Bond average scale score[b]	-0.03	0.10	-0.29	0.20	4.75	0.31
M	10.95	4.95	4.89	2.05		
SD	9.47	4.99	4.04	2.01		

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
[a] Spearman's rho is reported for these variables
[b] Adjusted for outliers

The WAI:SR Task average scale scores and AQ Motor/sensory discrepancy scores were assessed with appropriate nonparametric measures because of their skew or kurtosis. In addition, the WAI:SR bond scores were adjusted for outliers using the procedures outlined in the

methodology section. The sums and average scale scores of each dyad on the WAI:SR and its subsections, as well as their discrepancy scores on the AQ and its factors, are listed in Table 3.

Table 3
WAI:SR Average Scale Scores and AQ Discrepancy Scores

	WAI:SR					AQ			
Client (*n* = 19)	SUM total	Total scale score	Task scale score	Goal scale score	Bond scale score [b]	Total Discrepancy Score	Cognitive Discrepancy Score	Behavioral/affective Discrepancy Score	Motor/sensory Discrepancy Score
C1	55	4.58	4.25	4.75	4.75	8	-1	5	4
C3	52	4.33	4.25	4.00	4.75	3	1	2	0
C4	60	5.00	5.00	5.00	5.00	-23	-11	-5	-7
C5	60	5.00	5.00	5.00	5.00	-3	-2	0	-1
C6	57	4.75	4.75	4.50	5.00	-1	0	-2	1
C7	55	4.58	4.25	5.00	4.50	30	16	11	3
C8	38	3.17	3.00	2.25	4.25	20	9	9	2
C9	56	4.67	4.00	5.00	5.00	20	12	6	2
C10	49	4.08	4.00	4.00	4.25	7	1	5	1
C11	60	5.00	5.00	5.00	5.00	12	5	5	2
C12	32	2.67	2.25	2.50	3.25	14	2	12	0
C13	57	4.75	4.25	5.00	5.00	-5	3	-6	-2
C14	59	4.92	4.75	5.00	5.00	-13	-5	-1	-7
C15	60	5.00	5.00	5.00	5.00	29	14	14	1
C16	38	3.17	1.75	2.75	5.00	2	2	2	-2
C17	59	4.92	5.00	5.00	4.75	-1	0	0	-1
C18	49	4.08	3.75	4.25	4.25	0	1	-2	1
C19	47	3.92	3.75	3.50	4.50	-10	-5	-3	-2
C20	60	5.00	5.00	5.00	5.00	7	4	3	0

Note: A higher score on the WAI:SR Total scale score indicates a stronger therapeutic alliance. The WAI:SR questions included in each subsection are the following: Task = 1, 2, 10, 12; Goal = 4, 6, 8, 11; and Bond = 3, 5, 7, 9. Average scale scores were calculated by summing the client scores on all pertinent questions and dividing the sum by the number of questions on the WAI:SR (N=12) or the number of questions in the subsections (n=4).

Note: AQ Discrepancy scores were calculated by subtracting the total score of the SLP from the total score of the client. In this measure a greater absolute score, either positive or negative, indicates a greater impairment in the client's self-awareness. Positive discrepancies indicate the client over-estimates his self-awareness; negative discrepancies indicate he under-estimates. The AQ questions included in each factor are as follows: Cognitive = 1, 4, 10, 11, 12, 13, 15; Behavioral/affective = 2, 3, 5, 14, 16, 17; Motor/sensory = 6, 7, 8, 9. The absolute values of all discrepancy scores were used for all analyses with this data.

The mean rating across clients for the overall WAI:SR was 4.40 (*SD* = .72); the mean rating for the WAI:SR Task subsection was 4.16 (*SD* = .95); the mean rating for the WAI:SR Goal subsection was 4.34 (*SD* = .94); and the mean rating for the adjusted WAI:SR Bond subsection was 4.75 (*SD* = .31). The mean discrepancy score across all dyads for the total AQ was 5.05 (*SD* = 13.75, range: -23-30); the mean discrepancy score for the AQ cognitive factor was 2.42 (*SD* = 6.70); the mean discrepancy score for the AQ behavioral/affective factor was 2.89 (*SD* = 5.72); and the mean discrepancy score for the AQ motor/sensory factor was -.26 (*SD* = 2.90). The mean absolute value discrepancy score across all dyads for the total AQ was 10.95 (*SD* = 9.47); the mean absolute value discrepancy score for the AQ cognitive factor was 4.95 (*SD* = 4.99); the mean absolute value discrepancy score for the AQ behavioral/affective factor was 4.89 (*SD* = 4.04); and the mean absolute value discrepancy score for the AQ motor/sensory factor was 2.05 (*SD* = 2.01).

No statistically significant differences were found the two groups of SLPs ("more consistent" and "less consistent") on the average scale scores of the total WAI:SR, the WAI:SR subsections, and the average rank scores on Item 1: Momentary Self-Awareness of the Self-Evaluation form; the results of independent two-sample t-tests and Mann-Whitney tests conducted to compare these variables are listed in Table 4.1 and Table 4.2.

Table 4.1
Independent Two-Sample T-Test between SLP Grouping and WAI:SR Total, WAI:SR Goal average scale scores, and Item 1: Momentary Self-Awareness of the Self-Evaluation Form

	Less Consistent (*n* = 9)		More Consistent (*n* = 10)			
	M	*SD*	*M*	*SD*	*t*	*p*
WAI:SR Total average scale score	4.40	0.60	4.40	0.84	-.01	1.00
WAI:SR Goal average scale score	4.25	0.94	4.43	0.98	-.40	0.70
WAI:SR Bond average scale score [b]	4.70	0.33	4.80	0.31	-.73	0.48

* Statistically significant at the 0.05 level
[b] Adjusted for outliers

Table 4.2
Mann Whitney-U test between SLP Grouping and WAI:SR Task and Bond average scale scores

	Less Consistent (n = 9)		More Consistent (n = 10)			
	Mean Rank	Rank Total	Mean Rank	Rank Total	U	Asymp. Sig. (2-tailed)
Item 1: Momentary Self-Awareness on the Self Evaluation form	11.67	105.00	8.50	85.00	30.00	.217
WAI:SR Task average scale score	9.78	88.00	10.20	102.00	43.00	0.87

* Statistically significant at the 0.05 level

Additional analyses were computed to examine the relationship of various demographic variables of the clients and SLPs to the scores on the WAI:SR. The demographic variables of number of treatment sessions and DOI to admission were adjusted for outliers according to the procedures outlined in methodology; the latter was also analyzed with nonparametric measures due to significant skewness or kurtosis. Neither SLP nor client age correlated to the WAI:SR. No significant differences were found between client sex on the total WAI:SR average scale scores or subsections; results of the independent two-tailed t-tests and the Mann-Whitney test are listed in Table 5.1 and Table 5.2.

Table 5.1
Independent two-sample t-test between Client Sex and Assessment Scores

	Female (n = 8)		Male (n = 11)			
	M	*SD*	*M*	*SD*	*t*	*P*
AQ Total discrepancy score	9.88	8.92	11.73	10.20	.41	0.28
AQ Cognitive discrepancy score	4.75	4.10	5.09	5.75	.14	.89
AQ Behavioral/affective discrepancy score	4.50	4.17	5.18	4.12	.35	0.73
WAI:SR Total average scale score	4.63	0.45	4.23	0.84	-1.19	0.25
WAI:SR Goal average scale score	4.59	0.60	4.16	1.11	-1.00	0.33
WAI:SR Bond average scale score [b]	4.81	0.29	4.70	0.33	-.74	.47

* Statistically significant at the 0.05 level
[b] Adjusted for outliers

Table 5.2
Mann Whitney-U test between Client Sex and WAI:SR Task and Bond average scale scores

	Female (n = 8)		Male (n = 11)			
	Mean Rank	Rank Total	Mean Rank	Rank Total	U	Asymp. Sig. (2-tailed)
AQ Motor/Sensory discrepancy score	9.13	73.00	10.64	117.00	37.00	.55
WAI:SR Task average scale score	11.25	90.00	9.09	100.00	34.00	.40
* Statistically significant at the 0.05 level						

The clients' severity of cognitive-communicative impairment did not have a significant effect on the total WAI:SR average scale score or subsections: results of the one-way analysis of variance (ANOVA) are listed in Table 6.1 and Table 6.2. No significant differences were found between client education levels on the average scale scores of the WAI:SR and its subsections; the results of the one-way ANOVA and Kruskal-Wallis tests are listed in Table 7.1 and Table 7.2.

Table 6.1
One-Way Analysis of Variance of WAI:SR Total and Task average scale scores and AQ discrepancy scores by Client Severity

		Sum of Squares	*Df*	*Mean Square*	*F*	*P*
WAI:SR Total average scale score	Between Groups	1.76	3	0.589	1.18	0.35
	Within Groups	7.45	15	0.50		
	Total	9.20	18			
WAI:SR Goal average scale score	Between Groups	3.14	3	1.05	1.24	0.33
	Within Groups	12.63	15	0.84		
	Total	15.78	18			
WAI:SR Bond average scale score [b]	Between Groups	0.03	3	0.01	0.10	0.96
	Within Groups	1.72	15	0.11		
	Total	1.75	18			
AQ Total discrepancy score	Between Groups	114.68	3	38.23	0.38	0.77
	Within Groups	1498.27	15	99.88		
	Total	1612.95	18			
AQ Cognitive discrepancy score	Between Groups	22.15	3	7.38	0.26	0.85
	Within Groups	426.80	15	28.45		
	Total	448.95	18			
AQ Behavioral/affective discrepancy score	Between Groups	33.12	3	11.04	0.64	0.60
	Within Groups	260.67	15	17.38		
	Total	293.79	18			

* Statistically significant at the 0.05 level
[b] Adjusted for outliers

Table 6.2
Kruskal-Wallis H test of the WAI:SR Task and Bond average scale scores by Client Severity

	M	*SD*	Kruskal-Wallis H	df	Asymp. Sig.
WAI:SR Task average scale score	4.16	.95	4.50	3	.21
AQ Motor/sensory discrepancy score	2.05	2.01	1.24	3	.74

* Statistically significant at the 0.05 level

A moderate negative correlation was found between the adjusted number of treatment sessions and the adjusted WAI:SR Bond average scale score, $r(17) = -.56$, $p = .013$. A moderate negative correlation was found between the adjusted number of months from DOI to rehabilitation admission and the total WAI:SR average scale score, *rho*(17) = -.46, $p = .046$, as well as the WAI:SR Task average scale score, *rho*(17) = -.51, $p = .03$. In other words, clients with longer interim periods between DOI and rehabilitation admission and clients with a greater number of speech treatment sessions were correlated with lower ratings of therapeutic alliance.

A negative correlation was found between the length of rehabilitation (i.e. number of months from rehabilitation admission to research participation date) and the adjusted WAI:SR Bond scale score, $r(17) = -.62$, $p = .005$. Time post-injury (i.e. number of months from DOI to research participation date) was adjusted for outliers according to the procedures outlined in the methodology and then assessed with appropriate nonparametric measures due to its skew; time post-injury negatively correlated to the WAI:SR Task average scale score, *rho*(17) = -.51, $p = .03$. In other words, clients with greater time post-injury and length of rehabilitation were associated with poorer rankings of therapeutic alliance.

Table 7.1

One-Way Analysis of Variance of WAI:SR Total and Goal average scale scores and AQ discrepancy scores by Client Education

		Sum of Squares	*df*	Mean Square	*F*	*P*
WAI:SR Total average scale score	Between Groups	3.23	3	1.08	2.70	0.083
	Within Groups	5.98	15	0.40		
	Total	9.20	18			
WAI:SR Goal average scale score	Between Groups	5.31	3	1.77	2.54	0.096
	Within Groups	10.46	15	0.70		
	Total	15.78	18			
WAI:SR Bond average scale score [b]	Between Groups	.28	3	0.09	.96	.435
	Within Groups	1.47	15	0.10		
	Total	1.75	18			
AQ Total discrepancy score	Between Groups	657.82	3	219.27	3.44*	.044
	Within Groups	955.13	15	63.68		
	Total	1613.00	18			
AQ Cognitive discrepancy score	Between Groups	135.47	3	45.16	2.16	.135
	Within Groups	313.47	15	20.90		
	Total	448.95	18			
AQ Behavioral/affective discrepancy score	Between Groups	183.49	3	61.17	8.32*	.002
	Within Groups	110.30	15	7.35		
	Total	293.79	18			

* Statistically significant at the 0.05 level

[b] Adjusted for outliers

Table 7.2
Kruskal-Wallis H test of the WAI:SR Task and Bond average scale scores by Client Education

	M	*SD*	Kruskal-Wallis H	*df*	Asymp. Sig.
WAI:SR Task average scale score	4.16	.95	3.04	3	.386
AQ Motor/Sensory discrepancy score	2.05	2.01	3.08	3	.379

* Statistically significant at the 0.05 level

Table 7.3
Post hoc Tukey HSD ANOVA Comparisons of Assessment Scores by Client Education

		AQ Total discrepancy score		AQ Behavioral/affective discrepancy score	
	N	*M*	*SD*	*M*	*SD*
Some high school	4	11.25	6.50	5.50	.58
Graduated high school	5	19.00_{a}	11.58	9.60_{ab}	4.62
Some college	3	$.67_{a}$	.58	1.33_{a}	1.16
College or post-graduate	7	9.43	6.97	2.71_{b}	1.9

Note: Shared subscripts represent statistically significant differences at $p < .05$

Research Question 3. Are the communicative behaviors exhibited by the SLPs related to the client's perception of therapeutic alliance?

The relative frequencies with which each SLP selected each intent under Item 2: Intent of the Self-Evaluation form are described in Table 8. The mean frequencies with which each intent was selected across SLPs are as follows, with intents 1 and 2 adjusted for outliers according to the procedures outlined in the methodology section. The mean frequency of intent 4 "provide information or guidance" was 34%; intent 7 "attempt to guide behavior" at 17%, intent 2 "convey receptiveness" at 15%; intent 6 "state objective information at 10%, intent 8 "reveal personal thoughts, intentions, or perceptions" at 8%, intent 5 "compare experiences" at 7%, intent 3 explain,

judge, or label the other's experience or behavior" at 4%, and intent 1 "put other's experience into words" at 2%.

Positive correlations were found between intent 2: "convey receptiveness" of Item 2: Intent of the Self-Evaluation form and the adjusted WAI:SR Bond scale score, $r(17) = .46$, $p = .047$, two-tailed, and the WAI:SR Goal scale score, $r(17) = .54$, $p = .02$, two-tailed. Also, a positive correlation was found between intent 3: "explain, judge, or label the other's experience or behavior" and the WAI:SR Goal scale score. No correlation was found between the average scale scores of each subsection of the WAI:SR and the frequency of verbal behaviors, nonverbal behaviors, or both verbal and nonverbal behaviors; the variable of nonverbal behaviors was adjusted for outliers according to the procedures outlined in the methodology section. The results of these correlation statistics are listed in Table 9. Intents 1 and 3 of Item 2: Intent of the Self-Evaluation were adjusted for outliers using the procedures discussed in the methodology section.

Descriptive statistics indicated that SLPs used verbal behaviors most often, with an overall mean frequency of 58% (range: .36-.92) across SLPs. Nonverbal behaviors were used with an adjusted mean frequency of <1% (range: .00-.13) across SLPs, and both verbal and nonverbal behaviors together were used with a mean frequency of 38% (range: .08-.64) across SLPs. The relative frequency of each type of behavior for individual SLPs is listed in Table 10.

Table 8
Frequencies for Item 2: Intent of Self-Evaluation form

SLP (n = 19)	#observed microgoals (n = 262)	1[b]	2	3[b]	4	5	6	7	8
S1	11	0.09	0.27	0.09	0.18	0.09	0.00	0.27	0.00
S3	17	0.00	0.12	0.06	0.35	0.06	0.24	0.12	0.06
S4	11	0.09	0.27	0.00	0.00	0.00	0.09	0.18	0.18
S5	18	0.00	0.11	0.11	0.28	0.06	0.22	0.17	0.06
S6	14	0.00	0.00	0.00	0.29	0.00	0.43	0.07	0.21
S7	11	0.09	0.18	0.11	0.18	0.00	0.09	0.18	0.09
S8	10	0.00	0.00	0.00	0.50	0.20	0.10	0.20	0.00
S9	15	0.00	0.20	0.07	0.33	0.07	0.33	0.00	0.00
S10	12	0.00	0.00	0.00	0.67	0.00	0.00	0.17	0.17
S11	14	0.07	0.21	0.00	0.29	0.14	0.07	0.14	0.07
S12	16	0.06	0.19	0.00	0.44	0.13	0.00	0.13	0.06
S13	14	0.00	0.21	0.07	0.21	0.00	0.00	0.29	0.21
S14	15	0.00	0.27	0.00	0.47	0.07	0.00	0.07	0.13
S15	16	0.00	0.31	0.06	0.31	0.06	0.00	0.19	0.06
S16	11	0.00	0.09	0.00	0.36	0.00	0.18	0.36	0.00
S17	13	0.00	0.08	0.08	0.23	0.08	0.15	0.23	0.15
S18	14	0.00	0.14	0.07	0.43	0.07	0.07	0.21	0.00
S19	16	0.00	0.00	0.00	0.31	0.25	0.06	0.25	0.13
S20	13	0.00	0.23	0.00	0.62	0.00	0.00	0.15	0.00
M		0.02	0.15	0.04	0.34	0.07	0.10	0.18	0.08
SD		0.04	0.10	0.04	0.16	0.07	0.11	0.08	0.08

Note: Columns labeled "1" through "8" represent the types of intent derived from the taxonomy of Stiles (1992): 1= "put other's experiences into words (e.g. repeat, restate, clarify)"; 2= "convey receptiveness (e.g. simple acceptance, salutations)"; 3= explain, judge, or label the other's experience or behavior"; 4= "provide information or guidance"; 5= "compare experiences (e.g. agreeing, disagreeing, sharing experiences)"; 6= "state objective information"; 7= "attempt to guide behavior (e.g. cues and prompts, suggestions, prohibition, commands)"; and 8= "reveal personal thoughts, intentions, or perceptions." Mean frequencies for each intent were calculated by dividing the total frequency of each intent by the observed number of microgoals for each SLP. Percentage completed microgoals for each SLP was calculated by dividing the observed number of microgoals for each SLP by the total possible microgoals (N=21). Mean completion of microgoals across SLPs was calculated by dividing the sum of observed microgoals across all SLPs (n=261) by the sum of the total possible microgoals for all SLPs (N=399).

[b] Adjusted for outliers

Table 9

Correlations between WAI:SR scale scores and AQ Discrepancy Scores to Item 2: Intent of the Self-Evaluation form and the Frequencies of Verbal behaviors, Nonverbal behaviors, and both verbal + nonverbal behaviors

		WAI:SR				AQ			
		Total scale score	Task scale score [a]	Goal scale score	Bond scale score [b]	Total discrepancy Scores	Cognitive discrepancy Scores	Behavioral/affective discrepancy Scores	Motor/ Sensory discrepancy Scores [a]
Item 2: Intent of the Self-Evaluation form	1 [b]	0.05	0.12	0.15	-0.06	0.45	0.31	0.37	0.44
	2	0.44	0.45	.536*	.461*	0.43	0.39	0.32	0.30
	3 [b]	0.36	0.19	.467*	0.06	0.03	0.14	0.02	0.04
	4	-0.37	-0.42	-0.39	-0.4	-0.23	-0.28	-0.04	-0.44
	5	-0.38	-0.23	-0.45	-0.4	0.10	0.01	0.11	0.07
	6	0.08	-0.02	0.02	0.29	-0.22	-0.05	-0.37	-0.06
	7	-0.28	-0.23	-0.27	-0.12	-0.23	-0.20	-0.04	0.25
	8	0.32	0.34	0.28	0.14	-0.09	-0.12	-0.14	0.15
Behaviors	Verbal	-0.31	-0.11	-0.37	-0.07	-0.2	-0.3	-0.1	-.463*
	Nonverbal [b]	0.29	0.41	0.25	0.35	0.3	0.2	0.2	0.2
	Both verbal and nonverbal	0.2	-0.05	0.28	-0.07	0.1	0.2	0.0	0.3

* Correlation is significant at the 0.01 level (2-tailed).

Note: Rows of Item 2: Intent are labeled "1" through "8," representing the types of intent derived from the taxonomy of Stiles (1992): 1= "put other's experiences into words (e.g. repeat, restate, clarify)"; 2= "convey receptiveness (e.g. simple acceptance, salutations)"; 3= explain, judge, or label the other's experience or behavior"; 4= "provide information or guidance"; 5= "compare experiences (e.g. agreeing, disagreeing, sharing experiences)"; 6= "state objective information"; 7= "attempt to guide behavior (e.g. cues and prompts, suggestions, prohibition, commands)"; and 8= "reveal personal thoughts, intentions, or perceptions."

Note: Means and standard deviations for Item 2: Intent are listed in Table 8. Means and standard deviations for Behaviors are listed in Table 10.

[a] Spearman's rho is reported for these variables

[b] Adjusted for outliers

Table 10
Tallied Occurrence of Verbal behaviors, Nonverbal behaviors, or Both on each cluster of behavior for the observed microgoals on the Self-Evaluation form

SLP (n = 19)	#observed microgoals	1	2[b]	3
S1	11	0.45	0.00	0.55
S3	17	0.71	0.00	0.29
S4	11	0.36	0.13	0.36
S5	18	0.50	0.00	0.50
S6	14	0.43	0.00	0.57
S7	11	0.36	0.00	0.64
S8	10	0.60	0.00	0.40
S9	15	0.47	0.00	0.53
S10	12	0.92	0.00	0.08
S11	15	0.47	0.13	0.40
S12	16	0.63	0.06	0.31
S13	14	0.50	0.07	0.43
S14	15	0.60	0.07	0.33
S15	16	0.75	0.06	0.19
S16	11	0.91	0.00	0.09
S17	13	0.77	0.00	0.23
S18	14	0.36	0.00	0.64
S19	16	0.56	0.06	0.38
S20	13	0.69	0.08	0.23
Sum totals	262	152	11	99
M		0.58	0.03	0.38
SD		0.17	0.05	0.17

Note: Columns labeled "1" through "3" represent types of behavior: 1= verbal, 2= nonverbal, and 3= verbal+nonverbal. Mean frequency for each type of behavior was calculated by summing the total frequency for that type for each SLP, then dividing the sum by the total number of observed microgoals for each SLP.

[b] Adjusted for outliers

Research Question 4. Are the types of communicative behaviors exhibited by the SLPs related to the client's self-awareness?

A negative correlation was found between the relative frequency of verbal behaviors and the AQ Motor/sensory discrepancy score, $rho(17) = -.46$, $p = .05$. No correlations were found

between any intents of Item 2: Intent of the Self-Evaluation form and the AQ total discrepancy score or any of its factors, although the relationship between the adjusted intent 1: "put other's experiences into words (e.g. repeat, restate, clarify)" and the AQ total discrepancy scores approached significance, $r(17) = .45$, $p = .056$.

Additional analyses were computed to examine the relationship of various demographic variables of the clients and SLPs to the scores on the AQ. A positive correlation was found between SLP years of experience and the AQ behavioral/affective discrepancy scores, $r(17) = .52$, $p = .02$, two-tailed. In other words, a greater length of SLP experience corresponded to higher discrepancy scores. No significant correlations were found between SLP age and the AQ discrepancy scores.

No significant differences were found between client sex on the AQ discrepancy scores using independent two-tailed t-tests and the Mann-Whitney test; full results are listed in Table 5.1 and Table 5.2. No significant effects were found for the severity of cognitive-communicative impairment on the AQ discrepancy scores; full results of the one-way ANOVA used for this analysis are listed in Table 6.1 and Table 6.2.

Client education level had a significant effect on the AQ total discrepancy scores, $F(3, 15) = 3.44$, MSE(219.27,63.68), $p = .044$, and the AQ behavioral/affective discrepancy scores, $F(3, 15) = 8.32$, MSE(61.17,7.35), $p = .002$; results of the one-way ANOVA and Kruskal-Wallis tests are listed in Table 7.1 and Table 7.2. Post hoc Tukey's HSD tests for the AQ total discrepancy scores indicated that completion of a high school degree was significantly different from partial completion of college at $p < .05$; no other significant differences were found between education levels for this factor. Post hoc Tukey's HSD tests for the AQ behavioral/affective discrepancy scores indicated that completion of a high school degree was significantly different from partial completion of college and from college and post-graduate levels at $p < .05$; no other significant

differences were found between education levels for this factor. Complete post hoc results are listed in Table 7.3.

A moderate negative correlation was found between client age and the AQ total discrepancy scores, $r(17) = -.48$, $p = .04$, two-tailed, and the AQ behavioral/affective discrepancy scores, $r(17) = -.54$, $p = .02$, two-tailed. In other words, older clients were correlated with greater self-awareness (i.e. lower AQ discrepancy scores).

The adjusted number of treatment sessions positively correlated to the AQ behavioral/affective discrepancy scores, $r(17) = .48$, $p = .036$. In other words, a greater number of speech treatment sessions was associated with greater impairments in self-awareness. A negative correlation was found between the AQ cognitive discrepancy score and the adjusted number of months from DOI to rehabilitation admission, $rho(17) = -.46$, $p = .047$. No correlations were found between the AQ discrepancy scores and length of rehabilitation (i.e. number of months from rehabilitation admission to research participation date) or time post-injury (i.e. number of months from DOI to research participation date).

Research Question 5. What in-session factors are reported by the SLPs or observed by the researcher as having some effect on SLP behavior during the treatment session?

Although no additional interview or follow-up questions were asked of the SLPs during the post-task video review beyond what was required in the Self-Evaluation and Reflection assessments, SLP participants made comments during the post-task video review which indicated that their behavior was affected by client behavior, client therapy goals, and the therapy task. First, client behavior affected SLP behavior. For example, SLP 10 remarked that she made repeated attempts for eye contact with the client, but that the client's lack of visual attention to her person made these communication attempts unsuccessful. Likewise, the absence of client behavior

affected SLP communication; for instance, on Item 3: Perceived Need of the Self-Evaluation form, the SLP participants frequently chose a perceived need from the Therapist Impressions column (e.g. “therapist felt the client required clarification” or “therapist wanted to put the client at ease”) while selecting a neutral response (i.e. “none of the above”) from the Client Expression columns. Additionally, SLP 19 suggested that the existing rapport between herself and her client may have influenced the client’s behavior and likewise impacted her responses to the client.

Second, client therapy goals impacted SLP behavior by affecting the frequency and types of microgoals performed during the research task. For example, SLPs who targeted a client’s specific therapy goals during the task were observed to explicitly relate the task to the therapy goal by explaining the purpose of the session (microgoal 3) and the rational for the task (microgoal 5). More specifically, SLP 4 stated that she used the research activity as an opportunity for the client to catch and correct his own mistakes (i.e. online awareness) in accordance with his therapy goals; in his case, these goals were to improve communicative effectiveness and attention to detail. Therefore, SLP 4 remained mostly impassive throughout the session and thus very few microgoals were captured on camera.

Third and finally, two SLPs reported that the therapy task itself may have impacted their behavior. SLP 9 reported that the research task may have affected her communication with the client; this was echoed by SLP 15, who stated during assessment that it was difficult to predict her own behavior without knowing whether her client already knew how to play the research task.

Additional thematic analysis of the SLP comments and behavior recorded in the descriptive field notes revealed that the timing of a dyad’s scheduled participation sometimes resulted in the SLP greeting his client in the lobby (this occurred for six dyads, or 32%), requesting the client’s perspective of the research task as the researcher left (e.g. Dyad 13), or explaining the

purpose of session or rational of the task before the researcher arrived (e.g. Dyad 3 and 9); thus, these behaviors were not captured on camera or measured during the post-task video review.

SLP 18 expressed her apprehension about being videotaped to the client ("Are you nervous about the video? I am!"). Some degree of apprehension was also observed in other dyads; for example, Dyad 6 exchanged minimal communications of any kind throughout the research task, but upon shutting off the video both the SLP and client were noted to lean back, laugh, and interact socially with ease. This late-occurring relaxation was also observed in Dyad 5 and 12, with social interaction and a great deal of rapport-building seen at the conclusion of the research activity and during the transition to regular therapy tasks.

SLP behavior towards individual clients greatly varied during the research task. Each SLP completed the same task, using the same procedure, with a client with which there was an established relationship, yet with drastically different "styles." The following examples were taken from the descriptive field notes covering dyad interactions because they represent stark differences between SLP styles. SLP 3 communicated mostly through heavily didactic verbal communication that strictly pertained to the client's therapy strategies and life activities. SLPs 4 and 5 allowed the client to lead the task and then communicated primarily with nonverbal behavior, cueing by example rather than by explicit verbal instruction. SLP 5 often cued or ascertained client understanding by having the client paraphrase, explain, or reason through the rules or game-play. SLP 1 bombarded her client with constant questions about the game rules. SLP 18 punctuated every verbal communication with reflexive gestures and dynamic facial expressions; while SLP 16 used gestures specifically to increase client's comprehension. SLP 5 smiled at her client unceasingly throughout the session as a seemingly reflexive response to enjoying the game; inversely, SLP 14 very overtly communicated what would best be described as exasperation or

frustration towards her client via facial expressions. Incidentally, neither of these latter examples were explicit attempts at communication, but they were communication nonetheless.

On the questions of the AQ which are related to the client's current emotional control and adjustment compared to pre-injury, two of the dyads made additional comments attributing the clients' current functioning to the effects of pharmaceutical treatment. In other words, the client and/or SLP reported emotional/affective functioning was "about the same" as pre-injury functioning but only because the client was taking medication to address these deficits.

Data recorded in the descriptive field notes during the post-task review also included the comments of SLP 15, who remarked that her client's goal was to "go home" (i.e. be discharged from residential treatment services) but that this was an unrealistic goal reflective of the client's poor overall self-awareness of deficits. Upon scoring the AQ, Client 15 earned the highest discrepancy score out of all 19 SLP-client dyads; in other words, his self-awareness was highly impaired just as his SLP had predicted. Other comments recorded during the post-task review that were related to client self-awareness included those of SLP 10, who said that she found it difficult to complete the therapist form of the AQ as she had not known the client prior to injury. Additionally, SLP 10 commented that Item 2: Intent of the Self-Evaluation form should include an option reflective of "eliciting communication from the client." As this was already a hypothesized microgoal, the researcher explained each option of intent further, and used the following lead phrase to provide distinction between (a) microgoals, (b) intents, and (c) perceived need: "I "elicited communication" (microgoal) from the client in order to "compare experiences" or "convey receptiveness" (intent) because I felt the "client appeared uneasy or nervous" (therapist impressions). Following this explanation, the SLP felt more confident in selecting options on the Self-Evaluation form during the remaining video review.

Additional Information

The mean frequencies with which each option under Item 3a: Client Expression of the Self-Evaluation form were selected across SLPs are listed here in decreasing order, with option 1 adjusted for outliers according to the procedure outlined in the methodology section. Option 4 "none of the above" was chosen most often with a frequency of 76%; option 2 "client requests help or clarification" at 15%; option 3 "client appears uneasy or nervous" at 9%, and option 1 "client manifests negative affect" at 0%. The mean frequencies with which each option under Item 3b: Therapist Impressions of the Self-Evaluation form were selected across SLPs are listed here in decreasing order, with option 2 adjusted for outliers according to the procedure outlined in the methodology. Option 4 "none of the above" was selected most often with a frequency of 36%, followed by option 1 "therapist feels the client requires clarification even without a direct request" at 35%, option 3 "therapist wants to put the client at ease" at 28%, then option 2 "therapist feels the client has or is about to reach a point of bewilderment" at 0%. The relative frequencies with which each SLP selected each option under Therapist Impressions and Client Expressions are listed in Table 11.

Table 11
Frequencies for Item 3: Perceived Need of the Self-Evaluation form

		Client Expression				Therapist Impressions			
SLP	#observed microgoals (n = 262)	1 [b]	2	3	4	1	2[b]	3	4
S1	11	0.00	0.45	0.09	0.45	0.27	0.00	0.45	0.09
S3	17	0.00	0.12	0.29	0.59	0.47	0.00	0.35	0.18
S4	11	0.00	0.27	0.00	0.73	0.18	0.00	0.00	0.82
S5	18	0.00	0.00	0.11	0.83	0.33	0.00	0.22	0.44
S6	14	0.00	0.29	0.07	0.64	0.07	0.00	0.29	0.64
S7	11	0.00	0.36	0.00	0.64	0.45	0.00	0.09	0.45
S8	10	0.00	0.30	0.00	0.70	0.60	0.00	0.30	0.10
S9	15	0.00	0.00	0.00	1.00	0.40	0.00	0.20	0.40
S10	12	0.00	0.00	0.00	1.00	0.50	0.00	0.00	0.50
S11	15	0.00	0.13	0.13	0.73	0.20	0.00	0.33	0.47
S12	16	0.00	0.00	0.00	1.00	0.50	0.00	0.44	0.06
S13	14	0.00	0.14	0.21	0.64	0.29	0.00	0.50	0.21
S14	15	0.00	0.27	0.13	0.60	0.13	0.00	0.67	0.07
S15	16	0.00	0.00	0.00	1.00	0.44	0.00	0.25	0.31
S16	11	0.00	0.00	0.09	0.91	0.27	0.00	0.09	0.64
S17	13	0.00	0.00	0.00	1.00	0.54	0.00	0.08	0.38
S18	14	0.00	0.29	0.14	0.57	0.29	0.00	0.64	0.07
S19	16	0.00	0.19	0.06	0.75	0.25	0.00	0.13	0.63
S20	13	0.00	0.08	0.31	0.62	0.46	0.00	0.15	0.38
M		0.00	0.15	0.09	0.76	0.35	0.00	0.28	0.36
SD		0.00	0.15	0.10	0.18	0.15	0.00	0.20	0.23

Note: Client Expression columns labeled "1" through "4" represent the categories of client expression: 1= "client manifests negative affect"; 2= "client requests help or clarification"; 3= "client appears uneasy or nervous"; 4= "none of the above." Therapist Impression columns labeled "1" through "4" represent the categories of therapist impressions: 1= "therapist feels the client requires clarification even without a direct request"; 2= "therapist feels the client has or is about to reach a point of bewilderment"; 3= "therapist wants to put the client at ease"; 4= "none of the above." As each SLP was observed to complete a different combination of microgoals (N=21), average frequencies of each category for each SLP were derived by dividing the frequency of that category by the observed number of microgoals for each SLP. Total mean was calculated by summing the occurrence of each category across all SLPs and dividing it by the total number of observed microgoals (n = 262).

[b] Adjusted for outliers

CHAPTER 5: DISCUSSION

Both self-awareness and therapeutic alliance have been independently identified as factors which contribute to successful therapy outcomes (Cailhol et al., 2009; Prigatano, 2009), but existing research on these topics lack information and clarity on the relationship between these elements. A mixed methods approach was used in this study to examine the relationship between self-awareness and therapeutic alliance by assessing and measuring the degree of self-awareness exhibited by SLPs and their clients with brain injury, and by observing the therapeutic alliance between SLP-client dyads during a semi-structured therapeutic task. This section is a summary of the findings of the study and a discussion of their theoretical implications for the field of speech-language pathology.

Self-Awareness

The null hypothesis of Research Question 1 was that SLPs are not aware of the communicative behaviors they manifest in session. The null hypothesis is rejected, as SLPs indicated awareness of their communicative behaviors throughout the study. Evidence for their awareness is two-fold. First, SLPs marked their momentary self-awareness as 5 (*extremely aware*) in 52% of opportunities and 4 (*moderately aware*) on 26% of opportunities; second, SLPs predicted their primary communication modality with an average of 66% accuracy. As indicated by the momentary self-awareness ratings, SLPs demonstrated different degrees of self-awareness throughout their sessions and that self-awareness was relatively high within and across SLPs. Additionally, the range of self-scored awareness levels makes it clear that self-awareness is not a dichotomous variable (i.e. “aware” or “not aware”). The prediction score is best understood by first reviewing the operational definition of self-awareness: the ability to recognize one’s current

abilities and their consequent implications on life activities (Llorens et al., 2015). With that in mind, the relatively low percentage of prediction accuracy does not speak negatively of the SLP participants' awareness; rather, the remaining percentage of SLPs who changed their scores across the Prediction and Reflection forms also demonstrated some degree of self-awareness in that they recognized that their behavior was different than expected and altered their response accordingly. In contrast to the work of Williams and Fauth (2005) which examined the self-awareness of therapist trainees, the relatively high self-awareness of the SLPs in this study was not observed to have negative effects on the SLPs' behavior.

Taken together, these findings have important implications for future research on the topic of self-awareness. If self-awareness is to be measured via performance monitoring (Mikos et al., 2009), then measurements should be taken across multiple time points and interpreted as a whole (e.g. Galeone et al., 2011), rather than in a single performance on a specific task. Additionally, and particularly if a single performance-based measurement is used, then it should be coupled with other types of self-awareness measurements. For example, the current study used multiple performance-based assessments coupled with self-other ratings (i.e. discrepancy scores; e.g. Eslinger et al., 2005). Ultimately, using multiple types of assessments across multiple time points would be a better choice for assessing self-awareness as it accommodates the variability of self-awareness over time and addresses the possibility that the very act of completing a research assessment has the potential to impact scores.

The null hypothesis of Research Question 4 was that communicative behaviors exhibited by the SLP are not correlated to the client's self-awareness. The null hypothesis is unconfirmed. Verbal behaviors were negatively correlated to the AQ motor/sensory factor, but not to the total, behavioral/affective, or cognitive factors. At first glance, this has a fairly straightforward

interpretation: SLPs may address impairments in motor/sensory awareness with verbal behaviors more frequently than with nonverbal behaviors. There is partial support for that interpretation in the work of Brundage and colleagues (2006), who suggested that overall self-awareness is frequently addressed via clinician-directed discourse. However, this relationship occurred in isolation from any other AQ factor, which makes its application to cognitive-communicative rehabilitation during speech therapy less than clear. As no type of behavior (verbal, nonverbal, or a combination of both) correlated to any area of self-awareness that would typically be addressed within speech therapy (i.e. cognitive, behavioral, or overall), future studies should address the dynamics between these factors in more detail.

Although the intents driving SLP behavior did not correlate to client self-awareness in this study, it is possible that, similarly to the work of Kivlighan (1990), the correlation and direction of any hypothesized relationship was affected by the actualization of the intent via SLP behavior. In other words, it is possible that a relationship would have been apparent in the current study had the study procedure accommodated a more detailed analysis of the specific types of verbal and nonverbal behaviors manifested by the SLPs, relative to each particular intent indicated during their self-evaluations, as well as to any behavioral antecedents carried out by the client. The latter possibility has support in other findings of this study, as SLP participants reported that client behavior affected SLP behavior, and a relationship was found between SLP verbal behaviors and client motor/sensory self-awareness. Should future studies find a significant positive relationship between SLP intents and greater impairments in client self-awareness, it follows that the direction of such a relationship would likely move from client impairment to SLP intent (i.e. the severity of client impairment increases the frequency with which SLPs use that particular intent). However, finding either a positive or a negative correlation could demonstrate the potential reciprocity

between these factors; for example, clients with poor awareness may elicit certain intentions from the SLP (whereas clients with higher awareness would require other intentions from the SLP), and the SLP's responding intentions could then impact the client's level of awareness.

Additional data relevant to self-awareness was provided via analysis of the demographic variables of the client and SLP. Contrary to the findings of previous literature (e.g. Kelly et al., 2014; Dirette & Plaiser, 2007), neither the severity of cognitive-communicative impairment nor time post-injury (i.e. DOI to research participation) were correlated to the clients' self-awareness on any AQ factor (overall, cognitive, motor/sensory, behavioral/affective). As a relationship between these variables and self-awareness is supported in other studies, it seems likely that the current study lacked the statistical power to identify the expected relationship due to its sample size. The finding that SLPs with longer clinical experience were weakly correlated to clients with poorer overall self-awareness is not easily interpreted. The most plausible explanation would be that, after having received a description of the research topic, SLP participants with greater experience were more inclined to select clients from their caseloads who had greater impairments in self-awareness. However, it is equally possible that this finding is merely a reflection of the SLPs' changeable current caseloads.

Higher education had a positive effect on overall self-awareness, cognitive self-awareness, and behavioral/affective self-awareness of the client. There was a significant difference found between the mean scores of clients with high school degrees and clients who had completed some college, college, or post-graduate education. This finding is consistent with other studies indicating the positive effects of higher levels of education; for example, Heckman, Humphries, and Veramendi (2017) demonstrated that higher education improves overall mental health regardless of cognitive ability.

The finding that client age positively correlated to greater overall and behavioral/affective self-awareness is relatively novel. There is little current research that examines age and self-awareness in isolation in an adult population, with existing literature focusing on age and self-awareness typically within the context of emerging self-awareness in children or adolescence (Rochat, 2003), or the deterioration of self-awareness in the geriatric population secondary to other cultural, social, or medical factors (Diehl, Wahl, Brothers, & Martina, 2015; Langavant et al., 2013).

No relationship was found between client self-awareness and overall length of rehabilitation (i.e. number of months from rehabilitation admission to research participation date). Although the captured data is a reflection of the client's current state of self-awareness and not the evolution of his self-awareness over the course of the speech treatment, the absence of a relationship between these elements appeared in contrast to the positive correlation found between the adjusted number of speech treatment sessions and the AQ behavioral/affective discrepancy scores. The latter relationship could be interpreted two different ways: (1) clients with greater deficits in self-awareness receive speech therapy for greater lengths of time, and (2) persistent deficits in self-awareness may occur across the entire course speech therapy treatment (the second interpretation, in particular, finds support in the work of Kelley and colleagues [2014], discussed in the literature review). Taken together, these findings are a signal that treatment of awareness deficits are necessary during speech therapy, especially given that awareness is critical to outcomes across all rehabilitation domains (Ownsworth & Clare, 2006). In other words, these findings may indicate that improvements in cognitive-communication could plateau during the rehabilitation process without corresponding gains in awareness. These findings also evoke other questions for future research: namely, what approaches or strategies are used by SLPs to address client self-

awareness? When and how are the strategies applied, and how are they related to the in-session behavior of clients? Are these approaches used consistently and effectually? Also, what other factors related to the therapeutic process interact with client behavioral/affective self-awareness (e.g. participation in other therapies?) Finally, is there a pattern to the growth of self-awareness during speech therapy, where a certain number of treatment sessions could associate with a rise, plateau, or decline in client awareness?

Another variable related to client self-awareness was DOI to rehabilitation admission; a negative correlation was identified between this variable and the AQ cognitive factor. This finding could be interpreted to mean that either (a) the early stages of awareness recovery is facilitated by the plasticity and natural recovery of neural tissue following traumatic injury (Kleim & Jones, 2008); or (b) that this analysis was confounded by other variables not measured for the study (e.g. circumstances occurring in-between DOI and current rehabilitation enrollment, such as other therapy programs).

A final factor to mention in the discussion of demographic variables and self-awareness includes the possibility of unreported pharmaceutical intervention affecting the client's behavioral/emotional functioning post-injury. This factor was mentioned by 10% of clients during assessment. As it is very common for individuals with traumatic brain injury to report behavioral/emotional difficulties (Whelan-Goodinson, Ponsford, Johnston, & Grant, 2009), the influence of unreported medications on the client's current state of functioning, and his ability to self-reflect on his current state of functioning, could have impacted their self-rankings on the AQ.

Therapeutic Alliance

The null hypothesis for Research Question 2 was that client and SLP self-awareness is not related to the strength of therapeutic alliance. This hypothesis is unconfirmed. Surprisingly, no

statistically significant relationship was found between the WAI:SR scores and the SLP groupings ("more consistent" and "less consistent") nor the client AQ discrepancy scores. These results can be interpreted several ways. First, the two factors are related but (a) the study simply lacked power to generate statistically significant results; (b) the relationship would have been more evident had qualitative research interviews with the client participants (not just the SLP participants) been possible within the time constraints of the present study; or (c) had the AQ included a factor of social self-awareness beyond the items included as behavioral/affective self-awareness. As other studies have demonstrated that brain-injured clients with poor self-awareness have difficulty with interpersonal relationships and societal reintegration (McDonald et al., 2012; Kelley et al., 2014), this interpretation would be consistent with existing literature. Additionally, it could be argued that the self-awareness of individuals with high to normal levels of self-awareness (e.g. the SLP participants) should not be assessed by a quantitative measure, but rather by an analysis of behavior and the intentions driving that behavior (Geller & Foley, 2009).

A second interpretation, put simply, is that the two factors are not related. In other words, therapeutic alliance may not rely on self-awareness for its establishment, maintenance, or strength within SLP-client dyads, and self-awareness may develop independently from therapeutic alliance. This interpretation does not have support in existing literature and would open up several lines of inquiry for future research. Given the evidence in previous literature that low self-awareness affects interpersonal relationships, what is unique about therapeutic alliance such that low self-awareness would not demonstrate an observable effect on the working relationship? And, given evidence that both self-awareness and therapeutic alliance are related to treatment outcome (Cailhol et al., 2009; Prigatano, 2009), is it possible for "successful" treatment outcomes to be achieved if only one of these factors is high/strong and the other is poor? Additionally, does a

relationship between self-awareness and therapeutic alliance appear between clients with brain injury and professionals in other therapeutic disciplines? Alternatively, would a relationship between the factors be evident between SLPs and clients with other disorders, not just those with brain injury?

Additional insight on the nature of therapeutic alliance was found through the analyses of client and SLP demographic factors. Therapeutic alliance was not related to the clients' severity of cognitive-communicative impairment, sex, or education level, nor SLP or client age, but poorer reports of therapeutic bond were correlated to a greater frequency of speech treatment sessions as well as to a greater length of rehabilitation (from rehabilitation admission to the current date). The direction of these relationships was somewhat unexpected. Although not specifically hypothesized for this study, it was anticipated that clients and SLPs who worked together for longer periods of time would report a stronger therapeutic alliance, yet this was not the case. A negative relationship between these variables is an indication that the strength of therapeutic alliance is not tied to SLP-client familiarity and could possibly deteriorate over the course of the client's therapeutic relationships. However, this theory is best verified in future research assessing therapeutic alliance at the onset and at multiple points during a client's rehabilitation, in order to determine whether there is a pattern to the growth, maintenance, or deterioration of therapeutic alliance over the course of treatment. Incidentally, additional research could also examine the interaction between the variables of therapeutic bond, quality of life, and treatment satisfaction as they relate to the length of rehabilitation and the number of speech treatment sessions, as this would provide additional insight into the formation of treatment plans and duration of rehabilitation.

Finally, lower rankings of therapeutic alliance were associated with longer periods of time post-injury and time between DOI and admittance to rehabilitation. These correlations have

interesting implications. Existing research typically focuses on the factors related to therapeutic alliance within the parameters of an existing relationship; however, there is a possibility that a client's ability or willingness to establish a positive working relationship may be determined, consciously or subconsciously, by his experiences during the interim period between DOI and rehabilitation prior to having received treatment from a particular SLP. This possibility has partial support in the work of Kivlighan (1990) described earlier in the text. However, as there are indications in existing research that therapist variability has greater effect on the alliance than patient variability (Del Re, Flückiger, Horvath, Symonds, & Wampold, 2012), further research is needed to investigate this theory.

The null hypothesis of Research Question 3 was that communicative behaviors are not related to the client's perception of therapeutic alliance. The null hypothesis is accepted given the data that neither verbal behaviors, nonverbal behaviors, nor a combination of those behaviors were related to therapeutic alliance in this study. It would be incorrect to interpret the absence of a relationship between these variables to mean that those behaviors are inconsequential to therapeutic alliance, as there could be no therapeutic exchanges without the demonstration of some type of communicative behavior; so rather, this finding indicates that the frequency of any one type of behavior was not more influential than another on the client's perspective of his therapeutic relationship during this study. These results were somewhat unexpected as previous research indicates that verbal behaviors, and nonverbal behaviors interacting with verbal behaviors, are related to treatment outcome (Hill et al., 1981). Just as in the discussion of self-awareness, a more detailed analysis of the frequencies of specific types of verbal and nonverbal behaviors, as they relate to ratings of therapeutic alliance, could provide additional information on this potential relationship.

Additional insights on therapeutic alliance were found in an analysis of the intent behind SLP behaviors; the intents "convey receptiveness" and "explain, judge, or label the other's experience of behavior" positively correlated to reports of therapeutic alliance via the WAI:SR Goal and Bond subsections. This is especially significant when contrasted to the absence of a correlation between therapeutic alliance and intents of a more instructive bend that occurred with more frequency (e.g. "to provide information or guidance" or "attempt to guide behavior"). These findings are a signal for SLPs to (a) actively demonstrate metacognitive self-awareness by monitoring and adjusting the intentions which drive their communicative behavior towards clients, as well as to (b) depart from the customary approach to therapy in which therapists "intervene" and clients "respond" (Bohart & Tallman, 2010); this is not to minimize clinical expertise, but rather, to shift the relationship to a collaborating and understanding partnership such that the therapeutic alliance can flourish within the context of cognitive-communicative remediation.

Qualitative Findings

The discussion of therapeutic alliance and self-awareness would be incomplete without an interpretation of the qualitative results. The goal of Research Question 5 was to investigate the reported or observed in-session factors appearing to affect SLP behavior toward individual clients. One factor which may have influenced SLP behavior, aside from factors explicitly identified by SLPs (i.e. client therapy goals, client behavior, the research task), included the researcher's passive role during the therapy task. For example, SLP 4 gave her client the game instruction sheet and requested that the client explain the rules of the game. At the time, the researcher could only watch and speculate on the SLP's thought process when, whether by intent or accidentally, the SLP did not correct the client when he initiated the game with an incorrect understanding of game-play. Incidentally, regarding the reported impact of client behavior, even the absence of client behavior

was seen to influence SLP behavior during the research task; this was demonstrated when participant SLPs consciously decided that communication was necessary even in the absence of an explicit request or communication attempt from the client. Finally, regarding the possibility that the therapy task itself may have impacted SLP behavior (mentioned by two SLPs during assessment); the impact or influence of the task was not apparent during observation of any SLPs' behavior while they played the game. The lack of observational corroboration to those SLPs' comments is most likely due to the nature of the task; namely, that it was easily adaptable into typical therapy activities regardless of setting or client disorder. However, this finding is a clear reminder of the difficulties faced by clinical researchers to create treatment conditions that are natural and efficacious for individual clients and individual SLPs without sacrificing the integrity of the research or replicable, controlled treatment conditions.

A concerning finding reported by one SLP was her difficulty in completing the AQ for her client. The difficulty lay in comparing "then [pre-morbid functioning] to now," reportedly because the SLP did know the client pre-injury. The term "concerning" is used above to denote the researcher's surprise at the SLP reports, as the questions of the AQ reflect at the very least a basic knowledge of the client's case history, and at the most a thorough understanding of the client's baseline of cognitive and behavioral functioning. Although this difficulty may have occurred due to an absence of client documents related to medical history, it would seem reasonable for SLPs to obtain such information via client and/or family interviews. This finding underscores the importance of client and family interviews during evaluation; for although most standardized assessments generate a severity rating or diagnosis for the client's deficits, the discovery of premorbid functioning often lies in the investigative questioning of the SLP. So, while it is certainly possible that dynamic assessment can make the selection of therapy goals obvious for

particular clients, it would seem good practice for SLPs to establish a treatment plan based in a clear picture of the premorbid functioning [i.e the client's ideal outcome].

Perhaps the most notable finding of the qualitative analysis was the highly variable behaviors and communication styles observed of SLP participants during the research task. SLPs performed along a spectrum of styles, from didactic teaching characterized by heavy verbal instruction, questioning, or cueing, to partnered guiding characterized by nonverbal behavior such as listening, leading by example, or allowing the client to lead. This variability was not only a reflection of the SLPs personal "styles," it was also a mark of intentional effort by the SLPs to communicate in a functionally individualized manner for their clients. The variability was especially notable since the 19 SLPs adapted the exact same clinical procedure across their sessions regardless of the clients' individual deficit areas. This finding confirms the work of Ebert and Kohnert (2010) which emphasized that treatment outcomes are equally affected by an engaged and empathetic therapist who uses tailored communication for specific clients, as they are the specific techniques or stimuli used in therapy. Essentially, these findings place equal weight to the "why" (reasons for SLP behavior) and "how" (communicative behaviors of SLPs) rather than the "what" (specific techniques used). In a field where evidence-based practice (EBP) is the gold standard, this interpretation directs attention to the gaps in clinically relevant research within the field. In short, while evidence-based treatment activities are vital for clinical efficacy (Turkstra et al., 2015), research in the field of speech-language pathology should put equal effort into generating, analyzing, and promoting evidence-based clinical behaviors that enhance therapeutic alliance and promote the active involvement of the client in the therapy activities, along the lines of what has been produced for decades in clinical and behavioral psychology (Ackerman & Hilsenroth, 2003; Froján, Montaño, & Calero, 2010; Hill et al., 1981).

Finally, in keeping with the effort to preserve natural interactions between SLP and client, the researcher joined the SLP-client dyad on their own rehabilitation "turf" during a typical speech therapy session. By doing so, the SLP and client were captured on video completing the therapy task in an environment that was comfortable and familiar for both them. Although this method of data collection caused some variability in how dyads were scheduled for research participation (i.e. before, during, or after a regularly scheduled speech therapy session or other therapies); there was no notable effect of scheduling differences on SLP or client behavior aside from altering what was captured on camera (examples are provided in the Results section).

Theoretical Implications

To supplement the points discussed under the previous research questions, additional implications are discussed below with respect to future research, overall knowledge, and clinical practice in the field, and related to theories of the working relationship and client-clinician dynamics as discussed in the literature review.

First, given evidence in existing literature that therapeutic alliance is essential to treatment outcomes (Castonguay & Beutler, 2006; Toglia & Kirk, 2000), the field of speech-language pathology should place greater importance on therapeutic alliance and consider it an active factor of treatment outcome rather than an anecdotal effect of therapy (Castonguay & Beutler, 2006). Although many graduate education programs for SLPs include courses on counseling and clinical practice, the topic of therapeutic alliance– and the teaching and practice of skills inherent to quickly building strong therapist-client relationships– is infrequently taught or researched. In turn, it cannot be assumed that all individuals pursuing a career in communication sciences and disorders will have the skills necessary to establish strong working alliances with their clients; and likewise,

it cannot be assumed that all CCC-SLPs (even those with years of experience in brain injury) are equally skilled at establishing and maintaining good therapeutic alliance.

Second, there are two theoretical implications stemming from the negative correlations found between therapeutic alliance and the number of treatment sessions, length of rehabilitation, DOI to rehabilitation admission, and time post-injury. First, SLPs should be vigilant to counter any apparent treatment fatigue exhibited by the client over the course of treatment as it may negatively influence the therapeutic alliance. This may be accomplished by the consistent application of good clinical practices as discussed in the literature review, such as the use of individualized, functional, and collaborative tasks and treatment strategies, as well as being an engaged and empathetic therapist for the client. Second, there is a possibility that the client's ability to form a positive working relationship is established internally, prior to having met the therapist, but that is not to say that a relationship cannot be built over time or is unchangeable after initial establishment. A positive working alliance may be more easily established with a precedent knowledge of both the client's premorbid and post-injury functioning at the onset of treatment.

Third, based on the evidence in this study that SLP intents are correlated to therapeutic alliance, but that the modalities of communication (verbal or nonverbal) are not, future research should assess when, why, to what effect do communicative intents impact therapist behavior and subsequently impact client behavior. High value should be placed on understanding the internal intents which drive SLP behavior during therapeutic interactions, just as much as it should be placed on therapeutic techniques; for while evidence-based treatment activities are necessary and desirable for an SLP in any clinical setting, so also is a strong therapeutic alliance, and there is little available research that investigates efficacious clinical intentions relevant to the establishment and maintenance of therapeutic alliance. Additionally, as there is already evidence

that societal reintegration and interpersonal relationships are challenges commonly faced by individuals with brain injury, a closer examination of the intents and behaviors relevant to forming alliances within therapy could provide valuable insight into the intents and behaviors necessary from clients to form successful relationships outside the therapy session.

The following section discusses additional theoretical implications of the results of this study for current understanding of the role of self-awareness and rehabilitation in the field of speech-language pathology. Several theoretical implications are discussed below to supplement those which were mentioned under the previous research questions.

First, the third theoretical view of self-awareness which was discussed in the literature review is supported by the findings of the current study; namely, that self-awareness is both an overarching construct and a domain-specific construct, and the domains can be affected independently from each other by external variables. This was demonstrated in that different degrees of within-client self-awareness were observed across the factors of the AQ, and the AQ factors related differently from each other toward other variables in this study across clients. Because the relationship between the type and degree of awareness was not examined with respect to specific cognitive skills or neuropsychological functioning, it is difficult to use the findings of this study in direct support of the model of cognitive-communicative rehabilitation adapted from Ben-Yishay and colleagues (1985; Origami, n.d.) that was described in the literature review. However, as both a global and domain specific depiction of awareness is used in the model, the differential relationships identified between type or degree of awareness and the various focal variables in this study are indirectly supportive of awareness as depicted in this model.

Second, although the study contained one clear example of an SLP treating her client's awareness (i.e. SLP 4 who targeted anticipatory and emergent cognitive self-awareness by

requiring her client to "catch and correct" his errors during the task), it was unclear whether SLPs effectually targeted self-awareness during the therapy task or whether self-awareness was undertreated. However, this lack of clarity was somewhat expected, as (a) the current study was not a treatment study, (b) the therapeutic task was selected to facilitate a natural, casual interaction more than it was designed to target any specific goal areas, and (c) the client's self-awareness fell along a broad spectrum of impairment levels.

Third, given the reported difficulty that one SLP had in answering questions regarding her client's premorbid functioning, it is suggested in this study that (a) it is not sufficient to identify existing deficit areas without also knowing premorbid functioning, and that (b) gathering a complete case history is vital to establishing a general treatment plan with realistic expectations for the client's self-awareness and therapy outcome. Care should be taken to note the demographic variables of injury severity, level of education, and client age, as relationships between these variables and client self-awareness were revealed during the analyses of this study; a knowledge of these factors can guide the SLP's expectations of potential impairments in client self-awareness.

Fourth, self-awareness of the therapy professional (e.g. SLP) is instrumentally important to treatment. Just as is discussed in Geller and Foley's relational and reflective model of rehabilitation (2009), this study suggested that an SLP's underlying intentions and patterns of behavior are indications of his self-awareness (i.e. his active self-monitoring and adapting of behavior) and serve as a foundation for a strong therapeutic alliance and the construction of a safe environment within which all treatment activities operate. An SLP demonstrates self-awareness overtly by his communicative-behavioral responses to the client's own communication, and covertly by the intents driving that behavior. When appropriately demonstrated, SLP self-awareness can directly and indirectly impact the client's own self-awareness and/or performance

throughout the clinical session regardless of the therapeutic task at hand. It is worth noting that the results of this study do *not* indicate that the burden of successful treatment outcome lies entirely on SLP behavior. (Incidentally, there is evidence to the contrary in the work of Bohart and Tallman (2010), in which the authors stated that the behaviors or techniques used by the therapist are secondary to the client's active participation in the therapy process.) As a final note, SLPs of all experience levels will likely exhibit a range of self-awareness throughout their treatment sessions; with consistently high levels of self-awareness being desirable such that the SLP is monitoring his intents and communicative behaviors towards each respective client.

Lastly, and building off of the prior point, this study highlights a gap in existing literature on self-awareness as it relates to communicative behavior and intents. With a few exceptions (e.g. reflective practice and other techniques; Geller & Foley, 2009; Caty, Kinsella, & Doyle, 2015; Ackerman & Hilsenroth, 2003; Cailhol et al., 2009; Green et al., 2003), there is very little available to SLPs by way of research or education on strategies to both improve self-awareness and sharpen specific clinical communicative behaviors (Salter & Rhodes, 2018). This gap would best be addressed by analyzing SLP clinical styles and behaviors to (a) identify common ground between SLP approaches, (b) provide an evidence base for the clinical behaviors necessary to demonstrate and grow their own self-awareness, and (c) identify strategies by which SLPs can make effectual improvements to their existing communicative skills.

Conclusions

Self-awareness and therapeutic alliance are complex factors that contribute to successful therapy outcomes. Both topics have immediate clinical relevance to speech-language pathologists working with individuals with brain injury. Deficits in self-awareness are common after TBI (Lloyd et al., 2015; Llorens et al., 2015) and can negatively impact an individual's ability to accept

and compensate for deficits. Therapeutic alliance is necessary to engage the client in treatment (Castonguay & Beutler, 2006; Toglia & Kirk, 2000). The current study provides insight into the relationship between self-awareness and therapeutic alliance in pairs of speech-language pathologists and their clients with brain injury, as well as to the functional manifestations of self-awareness of the SLP. Additionally, the literature review that was provided in this study contains a summary of these topics with a focus on the theoretical and clinical models of cognitive-communicative rehabilitation for individuals with TBI.

Self-awareness is described here as a global construct that is modular and skill-specific. Self-awareness interacts with, but operates independently to, cognitive modalities. Supporting evidence for this view is found in studies demonstrating different degrees of awareness within and across domains, dissociations between types of awareness, and the existence of statistically significant relationships between types of self-awareness and various other skills. Neural correlates of self-awareness are typically located in the frontal cortices and frontal-subcortical pathways. Self-awareness is particularly susceptible to deficits following TBI, as TBIs can cause focal lesions to the frontal lobes, diffuse axonal injury, and/or breakdowns of pathways particularly within the frontal parietal control network. Impairments in self-awareness after TBI can improve over time, although residual impairments can remain for many years post injury (Kelly et al., 2014).

The presentation of awareness deficits after TBI includes symptoms such as loss of self-knowledge, poor self-monitoring skills, overestimation of performance, underreport of deficits, and poor task performance (Toglia & Kirk, 2000). In research literature, assessments for self-awareness are usually either evaluative judgments (e.g. self-other rating forms) or performance monitoring (e.g. predicted performance versus actual performance).

Evidence-based methods for treating self-awareness vary enormously in the research literature. Direct treatment approaches may include clinician-directed explanation and discourse that build on existing metacognitive skills, the use of a variety of error-feedback methods to facilitate error monitoring and the processing of experiences, and compensatory based strategies dependent on the individual's preserved awareness skills. Direct treatment of impaired self-awareness has the benefit of showing directionality of treatment effects; however, treatment of self-awareness is typically embedded within broader treatment such that self-awareness is indirectly addressed during the remediation of other cognitive-communicative or behavioral deficits programs (e.g. Waid-Ebbs et al., 2014; Ehlardt et al., 2005).

There are few theoretical models of cognitive-communicative rehabilitation that address both awareness and cognitive functioning in individuals with brain injury. An adapted model presented in this paper (Origami, n.d.) conforms to the theoretical view described above, with a description of self-awareness as both a global construct that can improve throughout various stages of recovery, and as a skill specific construct that can underlie acceptance and compensation of deficits for specific cognitive areas. Additionally, the model is a depiction of a hierarchical but interactive relationship between cognitive and neuropsychological processes; with the elements of arousal, alertness, and engagement supporting the progressively higher functions of attention, information processing, memory, and executive functioning. This theoretical model of rehabilitation has important clinical implications. First, a clinical SLP treating clients with brain injury should evaluate the underlying skills of a particular deficit to ensure that their treatment approach is efficacious (e.g. impairments in executive functioning may occur because of an underlying memory deficit). Second, direct and indirect treatment for awareness can positively

impact overall and skill-specific recovery by helping an individual to develop acceptance, recognition, knowledge, and compensation of their deficit areas.

Broadly, treatment after brain injury can be categorized as either restorative or compensatory; with the former representing an attempt to recover premorbid functioning, and the latter equipping the client to function as well as possible given residual deficits. Existing literature supplies an evidence-supported bank of treatment strategies for individuals with TBI; for example, repetition, consistency, modeling, and scaffolding behavior (Dumas et al., 2003); as well as strategy straining, group treatments, and errorless learning (Togher et al., 2014). Some treatment taxonomies suggest that explicitly defined targets and techniques are the keys to affecting change (Turkstra et al., 2015); others emphasize a therapist's and client's interpersonal dynamics as the primary variables affecting change (Ebert and Kohnert, 2010; Gillam et al., 2008).

During treatment, SLPs must choose therapy tasks to facilitate improvements in awareness and other cognitive-communicative skills. Selected tasks should be individualized, functional, and collaborative. These attributes are key to client involvement and have the greatest potential for achieving results that generalize into the client's real life (Ylvisaker et al., 2008). When applied correctly, these elements can shift therapist-client dynamics to resemble an equal partnership; wherein the client is engaged and sharing responsibility for his treatment outcomes, and the SLPs is acting as a partner with the client rather than acting as an instructor toward the client (Hand, 2006; Geller & Foley, 2009; Damico & Damico, 1997).

Treatment for self-awareness and cognitive-communicative deficits typically occur through therapist-client interactions, with the cumulation of these interactions representing a working relationship. In research literature, that relationship is referred to as therapeutic alliance. Therapeutic alliance, like self-awareness, has been associated with treatment outcomes and has

been considered a prerequisite for a patient's involvement in therapy (Schonberger et al., 2006; Medley & Powell, 2010).

Existing research in psychology literature has identified treatment techniques and therapist traits that improve therapeutic alliance and lead to positive therapeutic outcomes. Techniques include, but are not limited to, collaborative therapeutic activities, client-centric conversation, reflection, expressions of support or affirmation, requesting the client's perspective, and empathetic listening (Green, Stevens, & Wolfe, 1997; Ackerman & Hilsenroth, 2003; Green et al., 2003). Therapist traits include, but are not limited to, warmth, expertise, flexibility, communication, similarities between the therapist's and client's personalities, and the ability to establish rapport (Ackerman & Hilsrenroth, 2003; Andres & Schmidt, 1995; Ebert & Kohnert, 2010).

The study of therapeutic alliance highlights the importance of self-awareness in an SLP. SLP self-awareness is indirectly related to treatment outcomes by its role in affecting SLP behavior; the SLP must communicate and behave in a way that establishes and maintains a therapeutic alliance, thereby engaging the client in therapy, and thus increasing the client's potential to make improvements in self-awareness and other cognitive skills. An SLP must consistently demonstrate a high degree of self-awareness such that they can self-monitor (i.e. appraise and adjust their own behavior), integrate information, and understand the client's own behavior. SLPs demonstrate self-awareness through their communicative behaviors: a behavior that overtly or covertly communicates something to a partner. Behaviors can be verbal or nonverbal and are driven by internal intents; for example, if the SLP realizes that the client is becoming defensive, the SLP may internally decide (i.e. form an intention) that the client would benefit from hearing the SLP disclose his own personal feelings regarding the issue at hand. Thus

the SLP's behavior (disclosure) will carry out his intentions. The work of Kivlighan (1990) demonstrated a relationship between therapist-specific intents and therapeutic alliance, but those correlations were dependent on the actualization of the intent (i.e. the behavior used by the SLP) which differed largely across therapists. There exists only a few assessments of self-awareness that evaluate clinical, communicative behavior.

A mixed-method, correlational research design was used in this study to examine the relationship between self-awareness and therapeutic alliance within dyads of SLPs and their clients with traumatic brain injury. A summary of the study findings are as follows. SLPs exhibited a range of self-awareness across multiple assessment points during the post-task video review. SLP self-awareness was not related to therapeutic alliance when self-awareness was measured using a percentage of response consistency across Prediction and Reflection forms nor using the average rating of momentary self-awareness across SLPs.

When SLP self-awareness was measured by SLP behavior or intentions, some relationships between SLP self-awareness and therapeutic alliance became evident. Positive correlations were found between the intents "explain, judge, or label the other's experience or behavior" and "convey receptiveness" and therapeutic bond and goals; however, the categories of verbal, nonverbal, or both verbal and nonverbal SLP behaviors did not correlate to therapeutic alliance. Therapeutic alliance was negatively impacted by longer periods of time post-injury, time from DOI to rehabilitation admission, length of rehabilitation, and the number of speech treatment sessions; but, client characteristics such as age, sex, education level, severity of cognitive-communicative impairment, and level of self-awareness were not related to therapeutic alliance in this study.

Client self-awareness was affected by multiple factors. There was a significant effect of client education on overall and behavioral/affective self-awareness, with scores indicating that higher levels of education were associated with greater self-awareness. Greater impairments in client behavioral/affective self-awareness positively correlated to the number of speech-treatment sessions, and impairments in client cognitive self-awareness negatively correlated to the time from DOI to rehabilitation admission. No SLP intents were correlated to the client's self-awareness, although the frequency of SLP verbal behaviors were correlated to client motor/sensory awareness. There was no significant effect of length of rehabilitation, time post-injury, severity of cognitive-communicative impairment, or client sex on client self-awareness.

The results of this study indicate support for the theoretical view of awareness that considers self-awareness to be both global and domain specific, in that overall self-awareness and domain specific self-awareness were differentially correlated to the demographic and assessment variables within the study. Additionally, the results of this study indicated that SLP self-awareness may impact client self-awareness through its role in affecting therapeutic alliance. There was much evidence to indicate that SLPs' self-awareness is best evaluated by examining their expressed behavior and intentions rather than their relatively high ratings of momentary self-awareness. By using the former approach, correlations between SLP intents and therapeutic alliance became apparent, as well as between SLP verbal behavior and client motor/sensory self-awareness.

Finally, the findings of the study also highlight the importance of shifting the SLP clinical mindset away from one of didactic teaching and toward one of a collaborative partnership, in which the SLP interprets and responds to the client with receptivity and reflection, to the desired effect of building a stronger, more collaborative relationship that fosters improvements in self-awareness in the client.

Contributions and Recommendations for Future Work

This study addressed a gap in existing research and leads to the following theoretical implications for clinical practice and future research in the field of speech-language pathology. First, SLPs must be vigilant in their own self-awareness to form appropriate intentions and demonstrate effectual behavior in response to their clients. Second, SLPs should facilitate a therapy practice marked by collaboration and openness such that the client can achieve greater self-awareness and stronger therapeutic alliances with the desired effect of improving therapy outcomes. Third, given that therapist behavior was largely variable across the SLP participants, future research in the field of speech-language pathology should generate an evidence base for specific, clinical communicative behaviors and intents that have efficacy to improve client self-awareness, therapeutic alliance, and treatment outcome. Fourth, future research on self-awareness and therapeutic alliance would benefit from (a) assessing at multiple points to capture the change in these elements over time related to specific behaviors, (b) using both self-other ratings and performance-based monitoring to assess awareness, and (c) considering participant behavior and the intentions driving that behavior as primary indicators of self-awareness. Finally, future research should examine the potential that the internal characteristics of the client that were developed during time-post injury and the interim time post-injury and rehabilitation admission could affect his ability to form therapeutic alliances.

Limitations

Despite the consistently implemented semi-structured procedures to guide the interaction between SLP and client, there were nevertheless some elements that were difficult to control without compromising the fluidity or normality of an individual SLP-client dynamic. The most significant limitation was the relatively small sample size used in this study. Although it matches

or exceeds many published studies, the sample size decreased the power of the statistical analyses. However, the study procedures, particularly the maintenance of a normal therapy atmosphere, the use of single SLP-client dyads (as opposed to using multiple clients for each SLP), the inclusion of different rehabilitation facilities across multiple counties in MI, and the mixed-method approach adding supporting qualitative data, are infrequently found in clinical research and give power to the findings despite the limited sample size. Another limitation was the possibility that participant responses to the baseline assessments were affected by the severity of their cognitive-communicative impairment; although assistance was provided as needed to support each client's understanding and responses during the assessment period, the very nature of the clinical sample (i.e. inclusion of a range of impairment levels to simulate a real-world caseload) created the potential that more severely impaired participants might respond with poor accuracy, particularly to any question covering an abstract concept (e.g. quality of life). Other weaknesses include the variability of when research participation was scheduled for each dyad, as it may have affected the clients' or the SLPs' mental fatigue or emotional control in less than apparent ways; additionally hosting the research on the SLP's "turf" made it difficult to control interruptions while carrying out research activities. Finally, the Self-Evaluation questionnaire did not include an "Other" option in response to items 2 and 3, which would have allowed the SLP to generate intents or perceived needs additionally to the existing response options listed on the form. Although the omission of an "Other" category was necessary due to the time constraints of this study, future research may benefit from the inclusion of open-ended questions or response options to more deeply investigate SLP perspectives on their behavior.

Final Statement

In conclusion, this paper summarizes the topics of self-awareness and therapeutic alliance as they relate to the field of speech-language pathology and the rehabilitation of cognitive-communicative disorders in adults with brain injury. The information provided here, paired with the findings of the current research study, have direct application to clinical practice and future research.

APPENDIX A

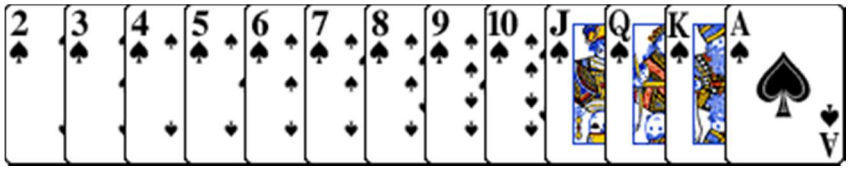
War Card Game Instructions

Object	To get all cards in your hand
Playing the Game	"The deck is divided evenly, with each player receiving 26 cards, dealt one at a time, face down. Anyone may deal first. Each player places his stack of cards face down, in front of him. Each player turns up a card at the same time and the player with the higher card takes both cards and puts them, face down, on the bottom of his stack. If the cards are the same rank, it is War. Each player turns up three cards face down and one card face up. The player with the higher cards takes both piles (10 cards). If the turned-up cards are again the same rank, each player places another three cards face down and turns another card face up. The player with the higher card takes all 18 cards, and so on."
Winning the Game	Whoever has the most cards when all cards have been played is the winner of the game.

Source: https://www.bicyclecards.com/how-to-play/war/

Cue Card

Lowest …….... Highest



Source: https://yppedia.puzzlepirates.com/images/b/bc/Card_ranks.gif

APPENDIX B

Working Alliance Inventory

Client version.

Working Alliance Inventory – Short Revised (WAI-SR)

Instructions: Below is a list of statements and questions about experiences people might have with their therapy or therapist. Some items refer directly to your therapist with an underlined space – as you read the sentences, mentally insert the name of your therapist in place of _____ in the text. Think about your experience in therapy, and decide which category best describes your own experience.

IMPORTANT!!! Please take your time to consider each question carefully.

1. As a result of these sessions I am clearer as to how I might be able to change.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

2. What I am doing in therapy gives me new ways of looking at my problem.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

3. I believe___likes me.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

4. ___and I collaborate on setting goals for my therapy.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

5. ___and I respect each other.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

6. ___and I are working towards mutually agreed upon goals.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

7. I feel that___appreciates me.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

8. _____ and I agree on what is important for me to work on.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

9. I feel _____ cares about me even when I do things that he/she does not approve of.

①	②	③	④	⑤

Seldom Sometimes Fairly Often Very Often Always

10. I feel that the things I do in therapy will help me to accomplish the changes that I want.

⑤ ④ ③ ② ①
Always Very Often Fairly Often Sometimes Seldom

11. _____ and I have established a good understanding of the kind of changes that would be good for me.

⑤ ④ ③ ② ①
Always Very Often Fairly Often Sometimes Seldom

12. I believe the way we are working with my problem is correct.

① ② ③ ④ ⑤
Seldom Sometimes Fairly Often Very Often Always

 Goal Items: 4, 6, 8, 11; Task Items: 1, 2, 10, 12; Bond Items: 3, 5, 7, 9

Therapist version.

Working Alliance Inventory – Short Revised - Therapist (WAI-SRT)

Instructions: Below is a list of statements about experiences people might have with their client. Some items refer directly to your client with an underlined space – as you read the sentences, mentally insert the name of your client in place of ___ in the text.

IMPORTANT!!! Please take your time to consider each question carefully.

1. ___ and I agree about the steps to be taken to improve his/her situation.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

2. I am genuinely concerned for ___'s welfare.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

3. We are working towards mutually agreed upon goals.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

4. ___ and I both feel confident about the usefulness of our current activity in therapy.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

5. I appreciate ___ as a person.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

6. We have established a good understanding of the kind of changes that would be good for ___.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

7. ___ and I respect each other.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

8. ___ and I have a common perception of his/her goals.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

9. I respect ___ even when he/she does things that I do not approve of.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

10. We agree on what is important for ___ to work on.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

APPENDIX C

Awareness Questionnaire

Client version.

Awareness Questionnaire
Patient Form

Name:_____ Patient #:_____ Date:_____

1	2	3	4	5
much worse	a little worse	about the same	a little better	much better

____ 1. How good is your ability to live independently now as compared to before your injury?

____ 2. How good is your ability to manage your money now as compared to before your injury?

____ 3. How well do you get along with people now as compared to before your injury?

____ 4. How well can you do on tests that measure thinking and memory skills now as compared to before your injury?

____ 5. How well can you do the things you want to do in life now as compared to before your injury?

____ 6. How well are you able to see now as compared to before your injury?

____ 7. How well can you hear now as compared to before your injury?

____ 8. How well can you move your arms and legs now as compared to before your injury?

____ 9. How good is your coordination now as compared to before your injury?

____ 10. How good are you at keeping up with the time and date and where you are now as compared to before your injury?

____ 11. How well can you concentrate now as compared to before your injury?

____ 12. How well can you express your thoughts to others now as compared to before your injury?

____ 13. How good is your memory for recent events now as compared to before your injury?

1	2	3	4	5
much worse	a little worse	about the same	a little better	much better

____ 14. How good are you at planning things now as compared to before your injury?

____ 15. How well organized are you now as compared to before your injury?

____ 16. How well can you keep your feelings in control now as compared to before your injury?

____ 17. How well adjusted emotionally are you now as compared to before your injury?

Therapist version.

Awareness Questionnaire
Clinician Form

Clinician Name:_____ Date:_____

Patient:_____ Patient #:_____

1	2	3	4	5
much worse	a little worse	about the same	a little better	much better

___ 1. How good is the patient's ability to live independently now as compared to before his/her injury?

___ 2. How good is the patient's ability to manage his/her money now as compared to before his/her injury?

___ 3. How well does the patient get along with people now as compared to before his/her injury?

___ 4. How well can the patient do on tests that measure thinking and memory skills now as compared to before his/her injury?

___ 5. How well can the patient do the things he/she wants to do in life now as compared to before his/her injury?

___ 6. How well is the patient able to see now as compared to before his/her injury?

___ 7. How well can the patient hear now as compared to before his/her injury?

___ 8. How well can the patient move his/her arms and legs now as compared to before his/her injury?

___ 9. How good is the patient's coordination now as compared to before his/her injury?

___ 10. How good is the patient at keeping up with the time and date and where he/she is now as compared to before his/her injury?

1	2	3	4	5
much worse	a little worse	about the same	a little better	much better

____ 11. How well can the patient concentrate now as compared to before his/her injury?

____ 12. How well can the patient express his/her thoughts to others now as compared to before his/her injury?

____ 13. How good is the patient's memory for recent events now as compared to before his/her injury?

____ 14. How good is the patient at planning things now as compared to before his/her injury?

____ 15. How well organized is the patient now as compared to before his/her injury?

____ 16. How well can the patient keep his/her feelings in control now as compared to before his/her injury?

____ 17. How well adjusted emotionally is the patient now as compared to before his/her injury?

1	2	3	4	5
completely	severely	moderately	minimally	not at all

_____18. To what extent is the patient's accurate self-awareness impaired by his/her brain injury?

APPENDIX D

Self-Evaluation Questionnaire

Self-Evaluation form

Self-Evaluation

1. *Rate your self-awareness at this point in the session.*

Not at all aware of self	Slightly aware of self	Somewhat aware of self	Moderately aware of self	Extremely aware of self
1	2	3	4	5

2. *Circle the option that BEST describes the intent behind these behaviors.*

• Put other's experiences into words (e.g. repeat, restate, clarify)
• Convey receptiveness (e.g. simple acceptance, salutations)
• Explain, judge, or label the other's experience or behavior
• Provide information or guidance
• Compare experiences (e.g. agreeing, disagreeing, sharing experiences)
• State objective information
• Attempt to guide behavior (e.g. cues and prompts, suggestions, prohibition, commands)
• Reveal personal thoughts, intentions, or perceptions

3. *Circle one option from <u>each column</u> that BEST describes <u>why</u> you felt these behaviors were necessary.*

Client expression	Therapist impressions
• Client manifests negative affect (e.g. frustration, anger)	• Therapist feels the client requires clarification even without a direct request;
• Client requests help or clarification	• Therapist feels the client has or is about to reach a point of bewilderment
• Client appears uneasy or nervous	• Therapist wants to put the client at ease
• None of the above	• None of the above

Rating of momentary self-awareness is adapted from Williams, O'Brien, & Gregorio (2003)
List of intents is adapted from Stiles (1992)

APPENDIX E

Prediction and Reflection Questionnaire

Prediction questionnaire.

1. ***My communication will be primarily:***
   [ ] verbal [ ] nonverbal [ ] about the same amount

2. ***Please rank the expected frequency with which you will use the following verbal behaviors to communicate.***
   a. Reflection: putting others' experiences into words (e.g. repeating, restating, clarifying)

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

   b. Acknowledgment: conveying receptiveness (e.g. simple acceptance, salutations)

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

   c. Interpretation: explaining or labeling (e.g. judgements on the other's experience or behavior)

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

d. Question: requiring information or guidance

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

e. Confirmation: comparing experiences (e.g. agreeing, disagreeing, sharing experiences)

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

f. Edification: stating objective information

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

g. Advisement: attempting to guide behavior (e.g. suggestions, prohibition, commands

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

h. Disclosure: revealing personal thoughts, intentions, or perceptions

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

3. Please rank the expected frequency with which you will use the following nonverbal behaviors to communicate.

a. Facial expressions

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

b. Eye contact

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

c. Pauses

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

d. Posture and Gestures

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

e. Attending behavior

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

f. Empathy

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

Reflection questionnaire.

1. ***My communication was primarily:***
   [ ] verbal [ ] nonverbal [ ] about the same

2. ***Please rank the approximate frequency with which you used the following verbal behaviors to communicate.***

   a. Reflection: putting others' experiences into words (e.g. repeating, restating, clarifying)

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

   b. Acknowledgment: conveying receptiveness (e.g. simple acceptance, salutations)

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

   c. Interpretation: explaining or labeling (e.g. judgements on the other's experience or behavior)

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

   d. Question: requiring information or guidance

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

e. Confirmation: comparing experiences (e.g. agreeing, disagreeing, sharing experiences)

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

f. Edification: stating objective information

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

g. Advisement: attempting to guide behavior (e.g. suggestions, prohibition, commands

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

h. Disclosure: revealing personal thoughts, intentions, or perceptions

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

3. ***Please rank the approximate frequency with which you used the following nonverbal behaviors to communicate.***

   a. Facial expressions

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

   b. Eye contact

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

   c. Pauses

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

   d. Posture and Gestures

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

e. Attending behavior

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

f. Empathy

Never	**Rarely** (less than 10% of opportunities)	**Occasionally** (about 30% of opportunities)	**Sometimes** (about 50% of opportunities)	**Frequently** (about 70% of opportunities)	**Usually** (about 90% of opportunities)	**Every Time**
1	**2**	**3**	**4**	**5**	**6**	**7**

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ABSTRACT

SELF-AWARENESS AND THERAPEUTIC ALLIANCE IN THE TREATMENT OF TRAUMATIC BRAIN INJURY

by

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Advisor: Dr. Margaret Greenwald

Major: Speech-Language Pathology

Degree: Doctor of Philosophy

Purpose: To further existing knowledge of self-awareness and therapeutic alliance in the field of speech-language pathology and to provide information on these topics that have immediate clinical application for cognitive-communicative rehabilitation.

The goal of this study was to investigate the relationship between self-awareness and therapeutic alliance in dyads of speech-language pathologists (SLPs) and their clients with traumatic brain injury (TBI). Although both topics have been independently associated with treatment outcomes in individuals with TBI, there is little research that investigates how these elements interact as they relate to client and SLP behavior. A mixed-methods approach was used to examine the interaction between these elements. Research questions targeted the communicative-behavioral manifestations of SLP self-awareness and the ratings of client self-awareness related to the client's perception of therapeutic alliance. Additionally, the findings were discussed with respect to clinical implications for the field. Nineteen dyads of SLP and TBI clients participated in this study. Procedure included a three-part process: (1) baseline assessments of self-awareness and therapeutic alliance, (2) participation in a video-taped therapy task, and (3) completion of a follow-up assessment by the SLP during a post-task video review. Results

indicated that therapeutic alliance is correlated to specific intentions that drive SLP behavior; these intents were to convey receptiveness and to explain, judge, or label the other's experiences or behavior. Therapeutic alliance was not correlated to the frequencies of SLP verbal or nonverbal behaviors, but was negatively correlated to longer periods of time post-injury, time from DOI to rehabilitation admission, length of rehabilitation, and the number of speech treatment sessions. Client self-awareness was not associated with ratings of therapeutic alliance. Impairments in client self-awareness were associated with a greater number of speech treatment sessions, and the frequency of SLP verbal behaviors correlated to the clients' motor/sensory self-awareness. The key clinical and theoretical implications of these findings are that self-awareness can be qualitatively measured by both internal intentions and external behaviors, in addition to being objectively measured by performance-based or self-other rating scales. Additional research is needed to (a) clearly identify which clinical behaviors and intents have efficacious results on client self-awareness and therapeutic alliance, and (b) further examine the relationship between self-awareness and therapeutic alliance. Finally, based on the results of this study, SLPs should use a collaborative, open, and receptive approach to their clients when providing cognitive-communicative rehabilitation in preference over the more traditional, verbally-didactic teacher/student approach.

AUTOBIOGRAPHICAL STATEMENT

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Whitney Neal is a contingent speech-language pathologist at Special Tree Rehabilitation System in Romulus, MI. She received her Bachelor of Science from Bob Jones University in Greenville, S.C., and her Master of Arts from Eastern Michigan University in Ypsilanti, MI. Her clinical and research interests are in the areas of neurorehabilitation and cognitive-linguistic impairments in adults with traumatic or other acquired brain injury. Whitney has worked with a traumatically brain injured and spinal cord injured population at Special Tree Rehabilitation for five years; she also worked for one year at a home and community-based rehabilitation company providing in-home treatment for the adult TBI population. She has presented at various conferences of the Michigan Speech-Language-Hearing Association and the American Speech-Language-Hearing Association. She has also served as an adjunct professor at the Graduate School of Eastern Michigan University to teach Acquired Neurogenic Cognitive-Communication Disorders. She is married to Justin Neal and is the proud mother of Blake Neal. She resides in Southgate, MI.