Utilizing Art Therapy to Recognize Cognitive-Communication Disabilities in Patients with Traumatic Brain Injury

By

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Abstract

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Wendi Michele Rankin

Traumatic Brain Injury (TBI) has been named the signature injury of the war in Iraq. Following injury, cognitive-communication disabilities may go unseen in TBI patients because of good verbal communication. Art therapy utilizes non-verbal communication and therefore may be helpful in recognizing these cognitive disabilities. This study uses a mixed method approach to show that verbal functional communication skills in TBI patients may be high even when cognitive-communication skills are low. Thirty TBI patients on a locked brain injury rehabilitation unit of a full service hospital were interviewed and asked to complete an art intervention. Verbal communication and non-verbal cognitive-communication in TBI patients were examined using a functional communication scale (FCS) and a cognitive-communication art therapy scale (CCATS). The results revealed that TBI patients scored high on the FCS even when they scored low on the CCATS. This study asserts that art therapy can be used to find cognitive-communication disabilities in TBI patients.
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Chapter I.

*Introduction*

*Statement of the Problem*

Traumatic brain injury (TBI) is a central public health problem (Thurman, Alerson, Dunn, Guerrero, & Sniezek, 1999). The number of people experiencing TBI is on the rise as is the rate of survival following a TBI (Dixon & Layton, 1999). Rehabilitation after TBI has proven to be a challenge for patients, families and professionals. There are two types of head injuries, closed and open. A closed head injury is when a blow to the head causes the brain to hit against an intact skull. An open head injury is when an object pierces through the skull into the brain tissue. Disabilities that may occur following TBI include problems with communication, motor functioning, mental health, and cognitive abilities. Often the ability to use language and underlying processes to communicate are impacted and result in cognitive-communication disabilities and disorders (Blosser & Depompei, 2001). Cognitive-communication disabilities may be unrecognized in TBI patients because they are masked by good functional communication skills (“Traumatic Brain Injury: Hope Through Research”, 2002). It is important to recognize disabilities promptly following TBI because recovery from cognitive deficits is greatest within the first 6 months after the injury (Thurman et al., 1999).
Purpose of the Study

The purpose of this concurrent mixed methods study was to use art therapy to identify hidden cognitive-communication disabilities in TBI patients through converging both details of qualitative data and broad numeric trends from quantitative research. Non-verbal cognitive-communication disabilities may easily go unseen in TBI patients because of good verbal functional communication skills. Art therapy utilizes non-verbal communication and therefore may be a vital tool in recognizing these cognitive disabilities. In this study a qualitative interview was used to explore verbal functional communication skills in patients who have experienced TBI and art therapy was used to acquire visual data relating to their cognitive abilities. Quantitative rating scales were then used to measure the relationship between the verbal communication skill level and non-verbal communication skill level in TBI patients at a full service hospital.

Research Question

Can art therapy reveal non-verbal indicators of cognitive-communication disabilities that are not seen when verbally communicating with TBI patients? It was hypothesized that TBI patient’s verbal functional communication skill level would be high even if their non-verbal cognitive-communication skill level, found utilizing art therapy, was low.
Definition of Terms

Art therapy- exploring personal problems and potentials through verbal and non-verbal expression and to develop physical, emotional, and/or learning skills through therapeutic art expression (Malchiodi, 2003).

Art therapy interventions- creative tasks that increase cognitive abilities, self-awareness, motor functioning, and socialization.

Cognitive abilities- mental skills such as problem solving, memory, concentration and visual comprehension.

Cognitive-Communication- the ability to use language and underlying processes such as attention, memory, self-awareness, organization, problem solving, and reasoning to communicate (Blosser & Depompei, 2001).

Cognitive disabilities- having difficulty with one or more types of mental tasks than the average person (Brain Injury Association of America [BIAA], 2004).

Concentration- the ability to focus attention on the task at hand.

Functional Communication- cognitive, linguistic, and speech articulatory abilities that allow individuals to communicate (Drummond & Boss, 2004).

Memory- the ability to recall what one has learned over time.

Motor functioning- movements of muscles in the body.

Problem-solving- the process of thinking that involves taking corrective actions
such as planning and organizing in order to meet objectives (Gemmy, 1998).

Psychomotor Agitation- unintended, meaningless actions such as pacing, rocking, or tapping ones feet (BIAA, 2007).

Self-awareness- understanding that one exists as an individual.

Socialization-interacting with others.

Traumatic Brain Injury (TBI)- traumatic injuries to the brain, also called intracranial injury, or simply head injury, occurs when a sudden trauma causes brain damage. (“Traumatic Brain Injury: Hope Through Research”, 2002).

**Delimitations and Limitations**

**Delimitations.** This study confined itself to TBI patients who were 16 years and older, and who were able to withstand three hours of therapy a day.

**Limitations.** In this study the patient’s injuries varied in degree. The lengths of time the patient’s were in the hospital also differed. The sample was made up of those patients who were willing to participate. The majority of the patients were male because the rate of injury was higher for this gender. The results of this study are tentative because of the small sample size and because the tool that was used to rate the TBI patient’s cognitive abilities was not extensively used or researched. In this mixed method study, all data was collected,
interpreted, and analyzed solely by the researcher. The brief length of time that this study took place also limited the study.
Characteristics of Mixed Methods Research

Mixed methods research is a combination of collecting and analyzing both qualitative and quantitative data in a single study. This method is relatively new to social and human sciences. The mixed method technique can be used to strengthen findings within a study, and to use one method to elaborate results from another method.

Type of Mixed Methods Design

This study employed a concurrent strategy of inquiry. This strategy was selected because two methods of collecting data were used in an attempt to confirm findings within one study. Two separate forms of qualitative and quantitative data collection occurred at the same time. A qualitative interview was given to obtain data relating to participants functional communication skill level, and an art therapy intervention was used to gather non-verbal visual data. The qualitative information gained from both the interview and patient’s artwork was then quantified in order to come up with a grounded theory.
Quantitative and qualitative data collection was implemented at the same time. The priority or weight was equal between the quantitative and qualitative approaches. The integration of the qualitative and quantitative data took place when the data was collected. The theoretical perspective used to guide this study was explicit.

Data Collection Procedures

Setting. This study took place on a locked inpatient brain injury rehabilitation unit of a full service hospital in a metropolitan area of the Midwest. Interviews and individual art therapy sessions were held in each patient’s room. The rooms were set up for double occupancy and contained two beds, two movable tray tables, two chairs, two telephones, two dry-erase boards, two televisions, one sink, one large window, and an attached bathroom with a toilet and an additional sink. The rooms were approximately 15 X 10 feet, had white walls, halogen-ceiling lights and were not spacious. Patients at this hospital were encouraged to make their rooms feel like home. They were allowed to hang
pictures on the walls, and each patient was provided with a bouquet of live flowers every Tuesday. The art supplies that were used during the individual sessions were brought by the art therapist, no other art supplies were in the rooms.

**Participants.** The participants of this study were patients 16 years and older who had suffered a traumatic brain injury with in the last 51 days. The patients had a variety of racial backgrounds including Caucasian, African American, and Hispanic. The brain injuries that the patients experienced varied in degree from mild, to moderate and severe. Their level of dependence was measured by the amount of assistance they needed, maximum, moderate, or minimum. The participants were selected by their willingness to participate.

**Types of Data.** Qualitative data collected for this study included observations of functional communication during an interview with the TBI patients and visual data in the form of TBI patient’s artwork. The observations of the patients behaviors during the interview were transcribed into quantitative data using a modified version of the Functional Communication Scale (FCS, Appendix B). The visual data and the observations of the patients behaviors throughout the art therapy session were then quantified using a rating scale designed for this study, (Cognitive Communication Art Therapy Scale Protocol, Appendix F).

**Methods of Gathering Data.** Data was collected from June 2007 to August 2007. This included 30-minute sessions with current TBI patients on the inpatient brain injury rehabilitation unit as well as sessions held with any new patients that
were admitted during the time of the research. The 30-minute sessions were broken down into a 5-10 minute interviews (interview questions protocol, Appendix A), and a 20-25-minute art therapy session (art therapy intervention protocols, Appendix C, D, E). Photographs of the artwork were obtained for visual data at the end of each session.

**Data Analysis and Validity Procedures**

Data in this study was analyzed by data transformation. Observations made during the interview and while patients completed the art interventions, along with photographs of the patient’s artwork were transcribed into inferential numerical quantitative data using rating scales. The quantified data was compared in order to find any significant relationship between the two variables, functional communication level and cognitive ability level. The patients gender, age, and number of days spent in the hospital were also examined to find any relationship between the TBI patients scores and these variables.

A modified version of a Functional Communication Scale (FCS) was used to quantify the observational data. An original 20-item functional communication assessment protocol was created by Elliot-Holland and Drummond to assess individuals with mild-to-moderate cognitive-communication deficits following TBI (Elliott-Holland & Drummond, 1998). Succeeding this pilot study, Drummond and Boss narrowed this scale down to 13-items based on preliminary results (Drummond & Boss, 2004). Another study was then
conducted using this scale to determine the reliability for application with individuals (2004).

This study used a revised version of the FCS. The scale used in this study did not include the additional characteristics that were at the bottom of the 13-item scale. Each of the 13-items on this scale were rated on a three-point rating system. A ‘0’ indicates inappropriate performance, a ‘1’ indicates partially appropriate performance, a ‘2’ indicates appropriate performance, and an ‘N’ indicates that the item was not applicable. A total of 26 points were possible on the FCS.

Observational and visual data of the art therapy sessions were transcribed using the Cognitive Communication Art Therapy Scale (CCATS). This cognitive communication protocol was created purposefully for this study by the researcher. It was designed to document and measure cognitive communication skills using observations of behaviors made during the art therapy sessions along with information gathered from TBI patient’s artwork. This scale consisted of four main cognitive ability sections, Problem-Solving, Concentration, Memory, and Affect. Beneath each cognitive ability category were artistic characteristics pertinent to that ability. The artistic characteristics were broken down into a three-point rating scale. The rating system corresponded with the Likert scale used one the FCS. This research was a pilot study and therefore this scale was not tested for internal validity or reliability.
Report Presentation Structure

The report presentation will be structured in the following way. First, a brief overview about TBI will be given. This overview will include statistics relevant to the study and the research problem. Second, the research question/hypothesis will be explained and a description of the study will be given. Included in this description will be the types of data that were collected, how the data was quantified, and the reasons why these methods of data collection were chosen. Next, examples of the patient’s artwork will be shown. Results of the study will then be presented along with any problems that occurred while collecting the data. In conclusion, the significance of the outcomes will be explained and suggestions for future research will be given.

Role of the Researcher

As the researcher of this mixed method study I took on the role of the primary data collector. I was an observer as participant. I conducted the face-to-face, in person interviews, as well as implemented the art therapy interventions. In addition to the primary data collector, I was also the sole person to interpret and analyze the data. My role at the hospital was an art therapy and counseling intern. I was at the hospital three days a week for an average of six hours a day for six months. Each week at the hospital I co-facilitated an inpatient Function Thru Art stroke patient group, an inpatient Open Studio, and a TBI outpatient Discover the Artist group. These groups were held in the Art Studio.
Additionally, I co-facilitated a TBI art therapy group on the inpatient brain injury rehabilitation unit, and I also conducted individual art therapy sessions on this unit with TBI patients in their rooms. The co-facilitator that I worked with was my site supervisor, a registered art therapist (ATR), who had worked at the hospital for ten years.

**Anticipated Ethical Issues**

No ethical issues arose during the research. The subjects in this study were informed of the nature of the investigation, the reasonably foreseeable risks, and the voluntary nature of his/her participation in verbal and written form. All participants of this study signed an informed consent form that gave permission to use information obtained during sessions as well as photographs of their artwork in a graduate study project (Appendix G). The names on the participant’s artwork were blocked out as a precaution to safeguard identifiable records of the individuals in this study. Fictitious names were also used throughout data collection, analysis, and validity of the data for immediate and long-range use of the data by others and myself.

**Significance of the Study**

This study was designed to show the relationship between the functional communication skill level of TBI patients and their cognitive-communication abilities. Good functional communication skills may mask cognitive disabilities in TBI patients. Art therapy is a non-verbal form a communication and
consequently may show the cognitive-communication disabilities that are not seen when verbally communicating with TBI patients.

*Expected Outcomes*

The expected outcome of this study was TBI patients would have good functional communication even when cognitive-communication disabilities were present. This would tentatively be proven if TBI patients scored a high measure of central tendency on the FCS even when the CCATS score was low. This expected outcome also relies on the prediction that art therapy interventions would reveal cognitive-communication disabilities in TBI patients.
Chapter III.

*Literature Review*

Over the last decade the incident rate of TBI has increased dramatically. TBI can result in a number of disabilities that not only impact the person injured, but also the people that surround them. When discussing TBI it is important to become familiar with the brain areas that may be damaged and there functions. Current research is being conducted in the areas of rehabilitation following TBI and the assessment procedures used to diagnose TBI. Although there have been many studies done documenting TBI, very few have been done with TBI and art therapy. Using creative tasks to stimulate areas of the brain that are not active when verbally communicating may aid in the recognition of cognitive-communication disabilities.

*Traumatic Brain Injury*

According to the Centers for Disease Control and Prevention, 1.5 million people in the United States will experience TBI annually. This number is six times higher than the incidence of breast cancer, HIV/AIDS, spinal cord injuries and multiple sclerosis combined (Center for Disease Control and Prevention [CDCP], 2001). Every year 50,000 people in the United States die as a result of TBI and 80,000 people suffer long-term disabilities. The leading causes of TBI are falls 28%, motor vehicle-traffic crashes 20%, and assaults 11% (BIAA, 2004). Other causes of TBI include lack of oxygen to the brain, stroke, electric shock,
brain surgery and brain tumors. TBI occurs 1.5 times more in males than females. Males are also more likely to die from TBI than females because they have contact with higher risk activities (Dixon & Layton, 1999). People ages 0-4 and 15-19 are at the highest risk of sustaining a TBI (BIAA, 2004). After the age of 60 the rate of TBI occurrence and mortality increases (Dixon & Layton, 1999).

The signature injury of the war in Iraq has been declared TBI (Mason, 2007). Exact statistics have not yet been released for the number of combat survivors that have experienced a TBI. It has been estimated by the Department of Veterans Affairs (2007) that over 7,500 returning soldiers have had a TBI but have not been diagnosed with such. Approximately 2,000 brain-injured soldiers have already received treatment (Mason, 2007). The ascending number of TBI has been associated with an increase in the use of improvised explosive devices (IED) in current warfare (Defense and Veterans Brain Injury Center [DVHIP], 2004). The IED’s cause closed head injuries that are not detected by the human eye. Non-visible TBI’s that have occurred in Iraq have not been documented and therefore TBI has been called the “Silent Epidemic”.

TBI results in a massive economic cost to society every year. The Brain Injury Association of America estimated direct and indirect medical expenses at $56.3 billion in the United States in 1995. These expenses include lost productivity, disability payments, and rehabilitation (BIAA, 2004).
It has been estimated that as a result of TBI 5.3 million Americans are living with a life-long need for help to perform daily activities (CDCP, 2001). Cognitive disabilities are the most persistent and prominent post-recovery of TBI (Cicerone, Dahlberg & Kalmar, 2000). An increasing survival rate following TBI has produced a population of chronic disability (Dixon & Layton, 1999).

The inability to manage stress, control temper and perform job skills has made it difficult for TBI patients to re-enter society (BIAA, 2004). Difficulties in communication may result in misunderstandings at school or on the job. Good cognitive communication skills are needed in order to successfully re-integrate into the home, school, work, and society. When TBI patients appear to have sufficient speech and language skills, they are expected to perform at a higher level than is realistically possible. They are expected to be able to follow directions, express themselves appropriately, and process information quickly. When they cannot fulfill these expectations, they are labeled incompetent (Blosser & Depompei, 2001).

Disabilities are frequently invisible following TBI (Dixon & Layton, 1999). Observers easily notice physical losses from TBI but cognitive disorders cannot be seen by the naked eye. Personality changes, behavior changes, and social interaction changes often result in misjudgment by family members, teachers, employers, and friends (Ylvisaker, Turkstra, & Coelho, 2005). A large number of TBI patients with cognitive and behavioral disabilities report that they
have nothing wrong with them (Dixon & Layton, 1999). TBI patients may not become aware of their deficits until they attempt to re-enter into normal life (Andersson, Emanuelson, Bjorklund, & Stalhammer, 2007). A reduction in self-awareness refers to underestimating the severity of impairment from TBI (Ezrachi, 1991). In a longitudinal study done by Pagulayan, Temkin, Machamer & Dikmen (2007) levels of awareness of injury were measured by TBI patients and their significant others. Results of this study contrast with most relevant research. They found that individuals with TBI reported more difficulties than their significant others rather than less (Pagulayan, Temkin, Machamer & Dikmen, 2007). This study also argued that inconsistent definitions and measurement approaches make it impossible to determine the magnitude of self-awareness of injury related changes in TBI patients (Pagulayan et al., 2007).

Changes do not only occur in the injured person’s life but in the lives of the people that surround them (Rocchio, 1997). Caring for the person disabled by TBI increases over time (Dixon & Layton, 1999). Providing an understanding and accommodating environment for TBI survivors may help them have success in social reintegration (Ylvisaker et al., 2005).

TBI can affect many fundamental brain functions. Signs and symptoms of brain injury include deficits relating to motor-control, sensation, visual perception, language, communication, cognition, personality, attention, memory, awareness and emotions (Dixon & Layton, 1999). All regions of the brain
operate together as a network to form a whole. If one region is damaged, activities in the other areas of the brain may be altered (Dixon & Layton, 1999). According to a study done by Ylvisaker, Turkstra and Coelho (2005) damage to the frontal limbic system may result in disinhibition, impulsiveness, lability, reduced anger control, aggressiveness, sexual acting out, inefficient learning from consequences and poor judgment. A blow to the head may result in the brain moving within the skull, which may cause stretching, swelling, or shearing of axons in the brain thus impairing the connection between the two cerebral hemispheres (Dixon & Layton, 1999). Weaknesses in the left upper or lower extremities usually result from right brain damage and vice versa (Dixon & Layton, 1999).

Impairment in expressive and receptive language is commonly referred to as aphasia. Aphasia is usually a sign of left frontal lobe damage. According to Dixon and Layton (1999) TBI patients rarely have complete aphasic syndrome. TBI often results in behavioral, emotional, and communication disorders such as that increase cognitive deficits (Coelho, Ylvisaker & Turkstra, 2005). People who have language deficits usually have problems organizing verbal output and comprehending complex sentences (Crosson, Cooper, Lincoln, Bauer, & Velozo, 1993). Damage to the visual cortex of the brain may cause problems in recognition of objects, spatial relationships, and the organization of three-dimensional objects (Dixon & Layton, 1999). Attention problems found in TBI
patients are usually caused from damage to the frontal lobe. A study by Jacob’s (1988) revealed that 60% of long-term survivors of severe TBI were observed to have attentional problems. Difficulty remembering newly learned information is the most prominent complaint given by TBI patients and their significant other (Dixon & Layton, 1999). According to a study done by Levin, Goldstein and MacKenzie (1997) 40% of people with moderate to severe TBI show poor memory skills compared to other areas of recovery.

Traumatic Brain Injury Rehabilitation and Assessment

Much literature has been written supporting the benefits of early clinical intervention after TBI. “Rehabilitation channels the body’s natural healing abilities and the brain’s relearning processes so an individual may recover as quickly and efficiently as possible” (BIAA, 2004). Once a person who has experienced a TBI is able to participate in therapy they are taken to an acute rehabilitation unit. On the rehabilitation unit a team of health professionals help aid TBI patients build up life skills that are needed for daily living. Included in this team of health professionals are psychiatrists, physical therapists, occupational therapists, speech and language pathologists, rehabilitation nurses, case managers, and neuropsychologists (BIAA, 2004).

Most rehabilitation programs on acute brain injury units are designed to encourage the recovery of cognitive functions and to reduce cognitive disability (Cicerone, Dahlberg & Kalmar, Langenbahn, Malec, Bergquist et al, 2000).
Specialists who work with communication disorders, usually speech pathologists, use TBI rehabilitation techniques that are directed towards cognitive, social and behavioral aspects of the disability (Ylvisaker et al., 2005). In a clinical study done to review research on interventions for disorders of behavioral self-regulation and social interactive competence after TBI, self-regulation and social interaction were usually found to be impaired after TBI and for this reason should be a primary focus in rehabilitation by specialists in communication disorders (Ylvisaker et al., 2005).

Cognitive rehabilitation is another type of therapy that may be used on the acute rehabilitation unit. This type of rehabilitation is oriented towards therapeutic activities that are supported by the assessment and understanding of brain deficits (Cicerone et al., 2000). In a scientific literature review related to the effectiveness of cognitive rehabilitation on TBI and stroke patients, it was determined that specific suggestions could be made for assisting the recovery of language, perception, attention, memory, functional communication and executive functioning following TBI. All interventions should be aimed at achieving improvements in areas of function that are relevant to daily living (Cicerone et al., 2000).

Andersson, Emanuelson, Bjorklund & Stalhammer (2007) hypothesized that early rehabilitation after TBI would reduce long-term disabilities. In this
study however, early intervention did not appear to change the outcomes one year post-injury (Andersson, Emanuelson, Bjorklund & Stalhammer, 2007).

Assessments are used to diagnose, give prognosis, research, acquire services, plan interventions, and to monitor rehabilitation (Coelho et al., 2005). Standardized assessments use rating scales geared towards specific brain functions to predict disabilities in TBI patients (Hall & Johnston, 1994). Nonstandardized tests are used to determine ability in areas where there are no standardized tests, to describe performance in real-world setting, to identify partner support, and to identify cognitive and communication demands of real-world contexts (Coelho et al., 2005).

In a study on the assessment procedures designed to facilitate functional and individualized intervention planning and monitoring of progress for persons with TBI, individuals with TBI demonstrated limitations in daily activities despite good performance on standardized cognitive and language tests (Coelho, et al., 2005). This study recommends using nonstandardized assessment when assessing real-world disabilities. Blosser and Depompei (2001) assert that standard tests for language problems often do not show major difficulty with language following TBI because communication problems appear in real-world situations rather than when assessed with standardized tests.

Assessments are often needed to determine cognitive-communication disorders following TBI. Cognitive-communication is the ability to use language
and underlying processes such as attention, memory, self-awareness, organization, problem-solving and reasoning to communicate (Blosser & Depompei, 2001).

Most TBI patients regain their ability to produce speech sounds and words after brain injury. When TBI patients return to their pre-injury level of speech, cognitive-communication disorders can be overlooked (Blosser & Depompei, 2001). During recovery from TBI, receptive and expressive language skills needed for communication may appear close to normal. In 2005, Coelho, Ylvisaker & Turkstra found that performance on aphasic batteries often reveal intact communication skills. These batteries usually focus on a single word or sentence level of communication. TBI patients rarely have trouble forming sentencing or understanding simple language. Chaytor, Schmitter and Edgecombe (2003) found that a distraction free environment and a supportive test administer may mask functional cognitive and emotional problem in TBI patients. Standardized test scores may be inflated because communication skills appear adequate in non-stressful situations.

**Traumatic Brain Injury and Art Therapy**

Art therapy is a type of therapy that utilizes art making as a form of non-verbal expression. It enables internal imagery to become visible through an external process (Lark, 2001). Mental images become a reality through the physical procedure of art making. Art therapy employs creativity as a means of describing feelings and situations (Malchiodi, 2003). Art expression is a primary
Art therapy is not a traditional left-brain method of therapy, and works well with populations that have sensory, verbal, or cognitive disabilities (McNamee, 2005).

Art making utilizes brain structures that deal with mental, physical, and emotional processes. Art therapy uses a combination of the right, non-verbal side of the brain, and the left, verbal side of the brain. By utilizing art expression and verbal dialogue, art therapists are able to make the hidden world of the right brain observable and accessible (McNamee, 2005). The connection between art expression and the different areas of the brain can be seen through neuroimaging by using functioning Positron Emission Tomography (fPET) and functional Magnetic Resonance Imaging (fMRI) (Lusebrink, 2004). These techniques, also known as brain mapping, can show the areas of the brain that are active while art is being produced. Art expression activates a number of different areas of the brain including the right and left hemispheres and those that are specialized for touch, vision, emotion, and movement. Seeing, hearing, touching, smelling, and tasting are primarily processed in the area of the cerebral cortex known as the primary visual cortex, the primary somatosensory cortex, and the primary motor cortex (Lusebrink, 2004).

The right hemisphere of the brain is often associated with creativity. It is the part of the brain that deals with visual spatial information, visual imagery, visual memory and the formation of non-verbal ideas (Zeki, 1999). This side of
the brain encodes sensory input as a whole. The right hemisphere recognizes emotion of facial expression, discriminates between color and hue, and is associated with intuition (Lusebrink, 2004). The right hemisphere also known as the non-dominant side of the brain distinguishes an objects size, distance, and orientation. This side of the brain is also closely related to the limbic system, which deals with primary emotions (McNamee, 2004).

The left hemisphere of the brain has been known as the verbal portion of the brain. Its primary functions include cognitive problem solving, language, and speech (McNamee, 2004). This left, dominant side, involves analytic and sequential processes. It has also been found to relate to serial movement and logical thinking (Lusebrink, 2004).

The primary visual cortex also called the striate cortex and V1 is the specific area of the brain found in the occipital lobe of the cerebral cortex that deals with vision (Zeki, 1999). This cortex along with its surrounding area known as the visual association cortex processes information from the retinas and relays this information to other modules of the brain (Lusebrink, 2004). It is this part of the brain that deciphers an objects shape, form, and color. There are 30 areas in the brain associated with vision (Zeki, 1999). These interconnected visual areas of the brain process direction, movement, and pattern recognition (Lusebrink, 2004). Adjacent points of the retina connect to adjacent points of the visual cortex.
therefore encoding input in the left visual field through the right eye and input to the right visual field through the left eye (Zeki, 1999).

The primary somatosensory cortex is the main sensory receptive area for touch. It is responsible for deciphering information about tactile materials (Lusebrink, 2004). When an object is touched, the cutaneous senses are activated and respond to pressure, vibration, cooling and heating. Haptic, tactile sensations are felt through joints and muscles and tell us an objects weight and hardness (Cheyne-King, 1990). The textures of objects are felt through movement of the skin over an object that creates the vibrations that are responded to by the somatosensory cortex (Lusebrink, 2004).

The primary motor cortex is responsible for the planning, control, and execution of voluntary motor functions (Lusebrink, 2004). This area along with the secondary motor cortices called the posterior parietal cortex, the premotor cortex, and the supplementary motor area are all essential parts of motor function. The posterior parietal cortex helps transform visual stimuli into motor commands. The premotor cortex assists in controlling and guiding movement. The supplementary motor area aids in more complex movements such as those that use both hands (Lusebrink, 2004). All of these areas of the brain are essential components of the creative process.

Research is at the beginning stages investigating the neural consequences of art (Kaplan, 2004). Kerry Kruk (2004) conducted a study utilizing
electroencephalograms to examine brain activity while making art, and found that clay work stimulates memory recall. Art therapy utilizes a combination of verbal and nonverbal therapy techniques that appeal to a brain-injured patient’s needs. Art making helps the brain reorganize neural networks and supports recovery (Zeki, 1999). Research that has been done on people who have had brain damage has revealed a large amount of information on cerebral localization. Localization refers to recognizing particular parts of the brain as being responsible for specific functions (Cheyne-King, 1990). Studies that have included art expression into their research have come up with a number of characteristics in patient’s art work that are associated with neurological handicaps. In 1979 Donald Uhlin, an art therapist, developed a list of criteria for evaluating neurological handicaps. The list includes an asymmetry in body image, distortion and rotation of form, redrawing and erasing, weak synthesis of parts, heavy line pressure, and primitive wholes (Cheyne-King, 1990).

Left hemisphere damage often results in language disturbances. Sometimes, but not always, left brain damage increases a person’s artistic ability. This may be due to left hemisphere damage taking away an orderly thought process (Zeki, 1999). Left-brain damaged patients artwork has been found to lack detail but show correct proportions. Over time patients who suffer from left brain damage are able to improve in their ability to copy pictures with practice. This is not true with right brain damage (Cheyne-King, 1990).
Damage to the right hemisphere of the brain can cause a number of distortions in visual perception. Visual inattention, which is due to lesions to the right hemisphere, leave people with a lack of awareness of visual stimuli in the left visual field, and often their drawings are completely on the right side of the paper (Cheyne-King, 1990). Prosopagnosia is the inability to recognize faces. Damage to the right hemisphere may lead to misreading facial expressions or the inability to recognize the meaning of facial expressions (Zeki, 1999). Visual agnosia, the inability to recognize familiar objects, has also been linked to right hemisphere damage (Cheyne-King, 1990). A person’s artwork that has suffered right side brain damage is usually fragmented. Their drawings are sparse, unclear, and omissions are usually made. Additions however, are commonly added to the drawings when a person has either right or left brain damage (Zeki, 1999).

The visual cortex is an area of the brain that if damaged can impact patients art making. Lesions to the visual cortex result in inaccurate perceptions and often simultagnosia, the inability to pay attention to more than one visual stimulus at a time (Zeki, 1999). Drawings by patients with damage to the visual cortex may show distortions in space perception and color identification (Cheyne-King, 1990).

The process of art expression relies on many areas of the brain including the right and left hemispheres, the visual cortex, the somatosensory cortex, and
the motor cortex. All of these areas work together to form a single piece of artwork. Damage to these areas may impact a patient’s artwork in a variety of recognizable ways. By being able to recognize neurological handicap characteristics, art therapists may discover cognitive disabilities not noticed when verbally communicating with patients.
Chapter IV.

Qualitative Data

Qualitative Data Collected

The qualitative data collected for this study consisted of observations made during 30-minute art therapy sessions, and visual data in the form of photographs of the TBI patient’s artwork created during the sessions. Thirty different TBI patients on a locked inpatient brain injury rehabilitation unit of a full service hospital were interviewed and asked to complete one of three art therapy interventions.

The 30-minute art therapy sessions began with a 5-10 minute interview using three open-ended questions relating to the patient’s injury. During the interview TBI patients speech, word production, grammar, sentence variety, pertinence to topic, verbal output, sentence organization, thought sequence, emotion, participation, and concentration were observed.

After the initial interview, the remaining 20-25 minutes of the sessions were used to complete 1 of 3 art therapy interventions. All of the interventions were geared towards identifying decision-making, attention, memory, and gross motor-skill level, and assessing the necessity of language and sensory stimulation. The three art techniques used were stamping, stenciling, and drawing. Observations made during the creative process included the TBI patient’s affect, ability to problem-solve, ability to concentrate, and memory skills.
Of the 30 TBI patients that participated in this study, 10 completed the stamping art intervention, 10 completed the stenciling art intervention, and 10 completed the drawing art intervention. Five of the 10 sessions with each art intervention will be discussed in this chapter along with photos of the artwork created during each session.

**Stamping Sessions**

The stamping art intervention was done on 9 x 12 inch x-ray board. The patient was first asked to choose one color of construction paper, an animal stamp that would serve as the focal point of their artwork, and three smaller stamps that they felt would coordinate with their animal stamp. The patient was then asked to ink up their large focal stamp with a black marker and stamp it onto a pre-cut 3-inch square of white paper. Next the patient was presented with a 12-pack of markers and asked to color in the stamped image with the colors that they felt were appropriate for that animal. The patient was then given a piece 9 x 12 inch piece of x-ray board, a pair of scissors and the construction paper they chose previously. The patient was next instructed to cut the construction paper into a square that was larger than the 3-inch square but smaller than 9 x 12 x-ray board. The patient was next asked to ink the three coordinating stamps that they chose previously with the colors they felt were appropriate for that stamp. The patient was asked to
do this with one stamp at a time and to stamp down the image onto the x-ray board as many times as they felt appropriate. The patient was then asked if there was anything they wanted to add to the artwork. If the answer was no, then the patient was told to sign the artwork with their name and the date. During this intervention the patient was asked why they chose the animal selected as the center focal stamp and if it related to them in any way.

The first patient to complete this art intervention was a 74-year-old African American male. He was slow to process information, his ability to recall and problem solve were low. His speech was partially clear and understandable; he used precise wording, and a good variety of sentences. The conversation was not balanced, he did not initiate topics, and he was unable to concentrate for long periods of time. He showed signs of left neglect, low strength, and was distracted easily. The picture he created is shown in Figure 1. His incorrectly completed artwork shows his inability to follow directions. His composition was somewhat balanced but the objects are disjointed and some are overlapping. His marks are sketchy, the amount of pressure he was able to apply was inconsistent, and he needed maximum cues to complete the intervention. This client made some eye contact but was unable to recall the correct day, month or year.
The next patient to complete the stamping art intervention was a 25-year-old African American male. He demonstrated clear and understandable speech, efficiently timed and delivered word production, precise word choice, a variety of sentences, an adequate amount of verbal output, and an organized thought sequence. His artwork is shown in Figure 2. The composition is balanced and symmetrical, objects are appropriately sized, centered and integrated. He needed minimal cues to complete the artwork but was unable to remember what month and year it was. Throughout this session the patient demonstrated a lot of attention seeking behaviors. He frequently asked for reassurance and was eager to show the staff his completed artwork. He stated he chose to stamp a tiger because he was strong and intimidating like a tiger.
The third patient to complete the stamping art intervention was a 59-year-old Caucasian male. His speech was clear and understandable, he verbalized a large range of his likes and dislikes and he displayed emotions consistent with topics being discussed. Throughout the interview this patient was very cooperative; he participated in conversations and showed bright insight. When the art intervention began the patient stopped initiating conversations, he demonstrated helpless behaviors and it became evident that his ability to recall information was limited to a minute-by-minute basis. Figure 3 is a photograph of his completed artwork. The composition is symmetrical and balanced, however the placement of the objects is disjointed. He was willing to stamp only the minimal amount of images and while stamping became frustrated easily. Once beginning the art, he acted impulsively and became unpleasant to be around. His
physical disabilities became pronounced and very recognizable. He chose a butterfly because it reminded him of his daughter.

A 57-year-old African American female was the next to complete the stamping art intervention. She did not demonstrate an adequate amount of verbal output, and when speaking, spoke very softly. Her use of grammar was limited and she did not initiate or sustain conversations. During the creative process, the patient related this art technique to her mother. She seemed to regress back to when she was a child as she giggled and grabbed the stamps with a lot of excitement. While creating she acted as she forget that anyone else was in the room. Her artwork is shown in Figure 4. The composition is asymmetrical and disorganized. She needed maximum cues to complete the project including hand
over hand help. The patient was not distracted easily; she was completely focused on the task at hand and smiled throughout the session. The way in which she stamped was aimless. She did not hesitate in between changing stamps; the repetitive act seemed to be calming for her. By the end of the session the patient was inattentive and preoccupied with the creative process.

![Image of a stamping intervention](image)

*Figure 4.*

The stamping intervention was next completed by a man who spoke clearly, used precise wording, and displayed an adequate amount of verbal output. He was a 73-year-old Caucasian male who was able to convey emotions relevant to the topics discussed. During the interview he was very energetic, aggressive and vocal about wanting to leave the hospital. He was distracted easily and did not seem to be aware of his deficits. This patient’s artwork is shown in Figure 5. The composition is symmetrical and organized. The artwork is lacking detail and
he put more time and effort into the conversation had during the art session than in the artwork itself. This patient could not recall the day, month, or year. His short-term memory and concrete reasoning skills were minimal. He related the rabbit to his times spent hunting.

Figure 5.

_Stencilizing Sessions_

The stenciling art intervention was done on 17 x 14 inch x-ray board. The patient was first asked to choose 3-5 stencils that could be put together to form a scene. After the stencils were chosen, the patient was given a variety of different colored tissue paper and told to choose three colors that would work well as the background of their scene. The patient was then instructed to tear the tissue paper into pieces and to organize them on the piece of x-ray board to form their background scene. Once the tissue paper was arranged, the patient was given a
paintbrush and a cup of water and told to wet down the tissue paper onto the x-ray board. After wetting all of the tissue paper and covering the entire piece of x-ray board, the patient was asked to remove the tissue paper that they had just wet down. The next step of this intervention was for the patient to organize their stencil onto the x-ray board to create their scene. The patient was then asked to stencil the images using black marker. After completing this step, the patient was instructed to fill in the stenciled images with whatever marker color they felt was appropriate. The patient was then asked if there was anything they wanted to add to the artwork. If the answer was no, then the patient was told to sign the artwork with their name and the date. During this intervention the patient was asked why they chose the animal selected for their scene and if they related to them in any way.

The first person to complete the stenciling art intervention was an 83-year-old Caucasian male. He demonstrated clear and understandable speech, used precise wording, concentrated on the topic being discussed, displayed an organized thought sequence, and used a variety of sentence structures. During the creative process he was easily distracted, showed delayed recall and his abstract reasoning skills were minimal. His artwork is shown in Figure 6. The patient was a professional artist, but was not easily engaged in the art. His composition was disjointed and he failed to color in all of his stenciled objects. He seemed to be unaware of his deficits and became frustrated easily when he was unable to
remember things or perform specific tasks such as tearing the tissue paper. It wasn’t until completing the picture that he finally smiled and showed self-confidence. He titled his work “over and under” and related this to the sea creatures weaving in and out of the water.

![Figure 6. Over and under](image)

The second patient to complete the stenciling art intervention was an 89-year-old Caucasian female. She demonstrated clear and understandable speech but was resistive when it came to participating in conversation. She did not initiate conversations, or display an adequate amount of verbal output. Her thought sequence was organized and she did answer questions when asked. Her artwork is shown in Figure 7. She titled her piece “mess”, because she was not pleased with the way it turned out. She became frustrated easily and refused to color in stenciled images or add details. Maximum cues were needed to complete
this project. Her composition was fragmented and disorganized. The stencils that she chose did not correspond with the environment that she created. She wanted to create an ocean scene but stenciled land animals onto the water and water animals onto the land. She showed a low level of problem solving ability, she was not able to stay focused for long periods of time, and she stated that she was only able to recall information day to day.

A 44-year-old Caucasian male was the next to complete the stenciling art intervention. He was impulsive and restless while conversing. His speech was clear and understandable and he displayed a vast vocabulary. The conversation
was not balanced; he talked the entire session and did not accept suggestions. His thought sequence was not organized and most of topics did not relate to one another. The patient seemed to be unaware of his deficits. His artwork is shown in Figure 8. The composition is not balanced or symmetrical. The patient was unable to follow directions and did not complete the project successfully. He did not seem to hear the instructions but instead seemed to be determined to create an image that was already in his head. While creating, the patient continued to talk and may have been confabulating or talking just to hear himself talk. He titled his artwork “therapy dripping” and stated he loves art and his favorite part of the picture was the dripping.

Figure 8. Therapy dripping
A female whose speech was hard to understand was the fourth patient to complete the stenciling art intervention. She was 50-years-old, African American, and spoke in incomplete sentences. She did not stay on topic, and used one or two words to answer questions. Her emotions were also inconsistent and she displayed signs of experiencing psychomotor agitation. Her artwork is shown in Figure 9. The composition is disorganized and unbalanced. Her color choices did not relate to the animals stenciled. The detailing is controlled and rigid, her marks are sketchy and jagged, and she applied a heavy amount of pressure when stenciling in the animals. She titled this piece, “the shoes” because she said that the pink fish looked like a shoe. The patient laughed throughout the entire session and seemed to enjoy herself.

*Figure 9. The shoes*
The fifth patient to complete the stenciling art intervention was a 59-year-old Caucasian female. She was able to initiate and sustain conversation, used precise wording, displayed an organized thought sequence, and used a variety of sentences. Her artwork is shown in Figure 10. She was able to stencil a number of different animals and use correct color variation, but the details are controlled and rigid and the marks are sketchy and jagged. The patient worked very slowly and paid a lot of attention to detail. She showed signs of left neglect but seemed to be very aware of her deficits. She titled her artwork “the zoo” because of the variety of different animals and her love of the zoo.

Figure 10. The zoo
**Drawing Sessions**

The drawing art intervention was done on 8 x 11 inch watercolor paper. The patient was given 30 different 8 x 11 inch animal pictures and asked to choose one animal picture that they felt related to them in some way. After the picture was chosen, the patient was given a pencil and asked to sketch the animal. Help was offered if the patient was hesitant or resistant. Once the drawing was complete, the patient was given watercolor paints and asked to paint the animal and the background. When the patient was done painting they were given a black marker and asked to add in any outline detail they thought would enhance the picture. Lastly, the patient was asked to sign their artwork with their name and the date. During this intervention the patient was asked why they chose the animal selected and how it related to them.

The first patient to complete the drawing art intervention was a 78-year-old Caucasian male. He was able to concentrate on the conversation, demonstrate an organized thought sequence, and display emotion consistent with topics being discussed. He did not use precise wording and became fatigued easily when conversing. His artwork is shown in Figure 11. To complete this project the patient needed maximum cues and hand over hand assistance. He was not easily motivated to complete the task. His fine motor skills were weak and therefore he could not apply a great deal of pressure to his brush stroke. His hands were
shaking throughout the session and he did not demonstrate awareness of his deficits. He was unable to recall his own name, the day, month, or year. He stated that he chose to paint the bunny because he loved the purple flower that was with it.

![Figure 11](image)

A 61-year-old Caucasian female was the next patient to complete the drawing art intervention. This patient was slow to process all information given to her. Although her words were softly spoken, her speech was clear and understandable. She initiated discussion about her family and the conversation never got off of this topic. Her emotions were consistent with the topic being discussed and she used precise wording in a variety of sentences. The patient’s artwork is shown in Figure 12. This woman chose a cat to draw because it reminded her of her daughter’s kitty. She was engaged in the art easily but
needed maximum cues to complete the project. The woman used an adequate amount of detailing, correct color variation, and decisive, well-controlled lines. During the creative process she was easily distracted and frequently looked at the picture of her family that was sitting next to her bed. When asked to date the artwork she was unable to recall the correct day, month, or year.

![Image](image.png)

*Figure 12.*

The third person to complete the drawing art intervention was a 23-year-old African American male. He displayed an adequate amount of verbal output, good organization of sentence structure, and efficiently timed and delivered word production. His drawing is shown in Figure 13. This patient was unable to apply a sufficient amount of pressure to the paintbrush. He asked for help a number of times and was distracted easily. While creating he made weak attempts to complete the project on his own. After finishing a step, the patient would ask for reassurance that he was doing it correctly. He was able to use basic problem-
solving skills to mix colors but became frustrated when his fine motor skills prohibited him from completing the art as quickly as he wanted. After painting he became fatigued and did not want to outline the animal. He stated that he chose to paint a wolf for his 5-year-old son who he missed greatly.

![Figure 13](image)

The next person to complete the drawing art intervention was an 84-year-old Caucasian female. She was very eager to converse, spoke clearly, and demonstrated an organized thought sequence. She was able to concentrate on the topics being discussed, and sustained conversation with related ideas. Her artwork is shown in Figure 14. When completing the drawing the patient had trouble following the directions. She could not remember what part of the picture she was working on or which color of paint she was using. Her lines were jagged and sketchy and her hand shook throughout the entire session. The patient was not afraid to ask for help, but became fatigued quickly. She was able to recall the
day, month and year by looking at the calendar above her bed. She stated that she
chose to draw a buffalo because it was an animal that she always wanted to see
but had never gotten to.

Figure 14.

The fifth person to complete the drawing art intervention was a 42-year-old Caucasian male. He spoke very little because of difficulty with his vocal
cords. He was motivated to speak as much as he could, but most of his
communication was limited to non-verbal gestures. His drawing is shown in
Figure 15. The patient was easily distracted and could not concentrate on the task
at hand for long periods of time. He needed maximum cues and hand over hand
assistance to complete the drawing. He was able to make appropriate color
choices and stated that wolves were his favorite animal. His image was grounded
and integrated but his lines were jagged and shorts. The patient was able to recall the day and month, but unable to recall the year.

Figure 15.
Chapter V.

Quantitative Results

The qualitative data collected in this study was quantified by using an adapted version of Elliot-Holland and Drummond’s Functional Communication Scale (FCS) and the Cognitive Communication Art Therapy Rating Scale (CCATS) created by the researcher. The independent variables in this study were the subject’s gender, age, and length of stay in the hospital. The dependent variables were the total FCS scores, the 13-items rated on the FCS, the total CCATS scores, and the four rated categories of the CCATS.

Description of Subjects

In this study 30 patients ranging in age from 19-89 were recruited as volunteer participants from a full service hospital. The average age of the patients was 56 years old. Of the thirty patients, 19 were male and 11 were female. All of the patients had recently experienced a variation of TBI, and had been in the hospital for no more than 51 days. The average length of time the patients had been in the hospital was 13 days. Background information on each patient is shown in Table 1.
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<th>Gender</th>
<th>Age (years)</th>
<th>Days in Hospital</th>
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</thead>
<tbody>
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<td>21</td>
</tr>
<tr>
<td>Male</td>
<td>50</td>
<td>14</td>
</tr>
<tr>
<td>Male</td>
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<tr>
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<tr>
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<td>9</td>
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<tr>
<td>Female</td>
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<td>20</td>
</tr>
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</table>
In this study, participants were rated on the FCS based on information obtained during a thirty-minute session between the patient and researcher. The mean score on the FCS was 20 out of 26. See Table 2., which provides statistics for each of the 13 items on the FCS, as well as the overall total score.
Table 2.  

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD(^a)</th>
<th>Variance</th>
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</thead>
<tbody>
<tr>
<td>Intelligibility</td>
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<td>0.3</td>
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<tr>
<td>Rhythm and intonation</td>
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<td>0.7</td>
<td>0.5</td>
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<td>Word usage</td>
<td>1.8</td>
<td>0.5</td>
<td>0.2</td>
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<tr>
<td>Grammar usage</td>
<td>1.4</td>
<td>0.7</td>
<td>0.5</td>
</tr>
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<td>Revisions</td>
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<td>0.6</td>
<td>0.4</td>
</tr>
<tr>
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<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Verbosity</td>
<td>1.4</td>
<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
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<td>0.5</td>
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<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Maintenance</td>
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<td>0.7</td>
<td>0.5</td>
</tr>
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<td>Cohesiveness</td>
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<td>0.5</td>
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<td>0.6</td>
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<tr>
<td>Total score</td>
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<td>6.0</td>
<td>36.0</td>
</tr>
</tbody>
</table>

\(^a\) denotes standard deviation
FCS scores and gender. Of the 30 patients who were scored on the FCS, 19 were males and 11 were females. The mean score on the FCS for males was 20.7, the mean score for the females was 20.0. On average the males scored 0.7 points higher on the FCS than the females (Figure 16).

FCS Averages Based on Gender

![Figure 16. FCS and gender](image)

The FCS is broken down into 13 different items. Of the 13-items, males scored on average, higher than the females in rhythm and intonation, word usage, grammar, verbosity, turn taking, maintenance, and cohesiveness. The females scored higher on average than the males in intelligibility, revisions, relevancy, initiation, emotional stability, and attention (See Figure 17).
Scores on 13-item FCS by Gender

Figure 17. FCS items and gender

FCS scores and age. The patients who were scored on the FCS ranged in age from 19-89 years old. The ages of these patients were broken down into five groups of age ranges: 15-30, 31-45, 46-60, 61-75, and 76-90. The average scores of each of these groups are shown in Figure 18. The patients in the 15-30 age group had the highest average on the FCS and the patients ranging in the 31-45 years old averaged the lowest. There was a 5.3 point difference separating the highest and lowest average of these groups.
The 30 patients in this study were each scored in the 13-items on the FCS by age (See Figure 19). The patients ranging in age from 15-30 averaged the highest scores in the intelligence, rhythm and intonation, grammar, verbosity, turn-taking, and maintenance. They tied with the patients ranging in age from 46-60 and 76-90 in the word usage and emotional stability categories. The patients ranging in age from 31-45 averaged the lowest scores in grammar, relevancy, and tied with the 61-75 age group for lowest average in cohesiveness. The patients in the 46-60 age group tied with the 76-90 age group for highest average in
attention. The 61-75 age group scored lowest in rhythm and intonation, revisions, verbosity, maintenance and attention. The 76-90 age group scored the highest average in the revisions category.

Figure 19. FCS items and age.

*FCS scores and days in the hospital.* The average number of days that the patients stayed in the hospital in this study was 13 days. The minimum number of days the patients were at the hospital was one day and the maximum number of days the patients were in the hospital was 51 days. The number of days the
The 30 patients scores were then broken down into individual scores in the 13-items on the FCS by the number of days they were in the hospital. The patients

Figure 20. FCS and days in hospital

The 30 patients scores were then broken down into individual scores in the 13-items on the FCS by the number of days they were in the hospital. The patients

patients were in the hospital was broken down into 6 categories: 0-5, 6-10, 10-15, 16-20, 21-25, and 25+. The patients who were at the hospital for 21-25 days scored the highest average on the FCS. Patients who were at the hospital for no more than five days averaged the lowest on the FCS. See Figure 20., which is a graph of these scores.
who had been in the hospital for 0-5 days averaged the lowest scores on intelligibility, rhythm and intonation, grammar, revisions, relevancy, and verbosity. They tied for the lowest average in the maintenance category with the patients who had been in the hospital for 11-15 days, and they tied with the patients who had been in the hospital for 26+ days in the attention category. The patients who had been in the hospital for 6-10 days scored the highest average in the rhythm and intonation category. Those who had been in the hospital for 11-15 days tied for the highest average in the emotional stability category with the patients who had been in the hospital for 0-5, 16-20 and 21-25 days. The patients who had been in the hospital for 16-20 days scored the highest average in the initiation category. The highest averages in grammar, revisions, turn-taking, and maintenance were scored by the patients who had been in the hospital for 21-25 days. Lastly, the patients who were in the hospital for 26+ days scored the lowest averages in the turn-taking, initiation, and emotional stability. See Figure 21, which is a graph of this data.
**Figure 21.** FCS items and days in hospital

**CCATS Scores**

The CCATS was scored using observations of the patients behaviors made during a 30-minute session between the patient and the researcher along with information obtained from the patient’s artwork. The CCATS is broken down into four categories: Problem-Solving, Concentration, Memory, and Affect. The mean score on the CCATS was a 16 out of 24 with a standard deviation of 4.9. Table 3 provides a breakdown of the mean, standard deviation, and variance for each category as well as the overall scores on the CCATS.
Table 3.

*Mean, Standard Deviation, and Variance of CCATS Scores*

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean</th>
<th>SD&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-Solving</td>
<td>4.4</td>
<td>1.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Concentration</td>
<td>3.5</td>
<td>1.7</td>
<td>2.9</td>
</tr>
<tr>
<td>Memory</td>
<td>3.1</td>
<td>1.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Affect</td>
<td>4.5</td>
<td>1.5</td>
<td>2.2</td>
</tr>
<tr>
<td>Total</td>
<td>15.5</td>
<td>4.9</td>
<td>24.1</td>
</tr>
</tbody>
</table>

<sup>a</sup>SD denotes standard deviation

*CCATS scores and gender.* The mean score for 19 males that were scored on the CCATS was 15.7 out of 24. The mean score for the 11 females was 16.5 out of 24. These scores are shown on the bar graph in Figure 22. On average the females scored 0.8 higher on the CCATS than the males.
The patients’ scores were broken down into the four categories on the CCATS (Figure 23). The male patients scored an average higher than the females in the problem-solving, and affect categories. The females scored only slightly higher than the males in the memory category. The males and the females averaged the same in the concentration category. Both females and male scored the lowest in the working memory category.
The average age of the patients in this study was 56 years old. Figure 24 is a graph of the mean scores on the CCATS according to the patient’s ages. The patients ranging from 15-20 years old scored the highest mean on the CCATS. The patients who fell into the 46-60 year old age group scored the lowest.
Figure 24. CCATS and age

Figure 25 is a graph of the average scores in the four categories on the CCATS based on the patient’s ages. The patients who were 15-30 years old scored the highest average in the affect category and the patients who were 46-60 years old scored the lowest. The highest averages in the concentration and problem-solving categories were achieved by the patients who were 31-45 years old. The patients in the 46-60 year old category scored the highest average in the memory category and the patients who were 76-90 years old scored the lowest.
Figure 25. CCATS categories and age

CCATS scores and days in hospital. The number of days that the patients were in the hospital was broken down into five-day increments. The patients who were in the hospital for 21-25 days scored the highest on the CCATS. Those who were in the hospital 16-20 days scored the lowest. Figure 26 is a graph of this data.
When the patients were put into categories based on age, the patients who were in the hospital 0-5 days scored the highest in the problem-solving category and the lowest in the memory category. They also tied for the lowest average in the affect category with the patients who were in the hospital for 11-15 days. Figure 27 is a graph of this data. The patients who were in the hospital for 16-20 days scored the lowest average in both the problem-solving and concentration categories. Those who were in the hospital for 21-25 days scored the highest average in the concentration, memory and affect categories.
Figure 27. CCATS categories and days in hospital

**FCS Scores and CCATS Scores**

The average score in percentages on the FCS was a 78.5%. The average score on the CCATS was a 64.6%. The difference between the two percentages is 13.9%. Figure 28 is a graph of the averages. Out of the 30 patients who participated in this study, 26 patients scored higher on the FCS than the CCATS. One patient scored the same on both, and 3 patients scored higher on the CCATS than the FCS.
Figure 28. FCS and CCATS scores

The Pearson Product Moment Correlation estimates the degree of linear association between two variables. It ranges from +1 to –1 with a +1 being a perfect positive relationship; it is represented by $r$ (Salkind, 2004). The FCS and CCATS correlation is $r = .6$. This means that the FCS and CCATS have a weak positive correlation. Figure 29 is a scatter plot of this data and includes a trendline to graphically show the trend of the data.
Figure 29. FCS and CCATS trendline

FCS CCATS and gender. The mean percentage score for the males on the FCS was a 79.6%. This score was 14.2% higher than the males mean score on the CCATS. The females FCS mean score was a 76.9% and the mean score on the CCATS was a 68.8%. The mean score for the females on the FCS was 8.1% higher than the average score on the CCATS. A graph of this data is show in Figure 30.
The Pearson correlation for males on the FCS and CCATS was $r = .5$. As the scores on the FCS increased so did the scores on the CCATS. A scatter plot of this data is shown in Figure 31. For females the Pearson correlation was $r = .7$. The positive correlation between FCS scores and CCATS scores for females indicate that as FCS scores went up, so did CCATS scores. This data can be seen in Figure 32.
Figure 31. FCS and CCATS males

Figure 32. FCS and CCATS females
FCS and CCATS by age. The mean percentage on the FCS for patients in the 15-30, 46-60, 61-75, and 76-90 age categories were higher than their mean percentage on the CCATS. The patients in the 76-90 year old age group had the largest difference in scores. The only group that scored higher on the CCATS than on the FCS was the patients in the 31-45 year old age group. Figure. 33 is a bar graph of the average scores on the FCS and CCATS by age.

Figure 33. FCS and CCATS and age

The correlation coefficients for the scores on the FCS and CCATS were calculated for each age group. Table 4. provides these statistics. Figures. 34, 35, 36, 37, and 38 are scatter plots of the FCS and CCATS scores according to age. All of the age groups had positive correlations indicating that as FCS scores increased, so did CCATS scores.
### Table 4.

**Pearson Product Moment Correlation by age**

<table>
<thead>
<tr>
<th>Age</th>
<th>$r$-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-30</td>
<td>0.9</td>
</tr>
<tr>
<td>31-45</td>
<td>0.8</td>
</tr>
<tr>
<td>46-60</td>
<td>0.6</td>
</tr>
<tr>
<td>61-75</td>
<td>0.6</td>
</tr>
<tr>
<td>76-90</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**Figure 34.** FCS CCATS 15-30

FCS and CCATS Ages 15-30

\[ y = 2.3859x - 143.98 \]

\[ R^2 = 0.9454 \]
Figure 35. FCS CCATS 31-45

$y = 0.5187x + 35.615$

$R^2 = 0.6286$

Figure 36. FCS CCATS 46-60

$y = 0.5656x + 16.296$

$R^2 = 0.4044$
FCS and CCATS Ages 61-75

\[ y = 0.3213x + 38.645 \]

\[ R^2 = 0.3164 \]

**Figure 37. FCS CCATS 61-75**

FCS and CCATS Ages 76-90

\[ y = 1.7473x - 85.07 \]

\[ R^2 = 0.4406 \]

**Figure 38. FCS CCATS 76-90**
FCS CCATS and days in hospital. The patients who were in the hospital for 6-10, 11-15, 16-20, 21-25, and 26+ days averaged a higher score on the FCS than on the CCATS. The patients who were in the hospital for 0-5 days averaged a lower score on the FCS than on the CCATS. These averages are provided in a graph in Figure 39.

Figure 39. FCS CCATS and days in hospital

The Pearson correlation for the scores on the FCS and CCATS were calculated for the patients by the number of days they were in the hospital. Table 5. gives these statistics. All of the groups had positive correlations between their FCS scores and CCATS scores. Scatter plots with trendlines of this data are provided in Figures. 40, 41, 42, 43, 44, and 45.
Table 5.

*Pearson Product Moment Correlation by Days in the Hospital*

<table>
<thead>
<tr>
<th>Days in the Hospital</th>
<th>r-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>0.5</td>
</tr>
<tr>
<td>6-10</td>
<td>0.8</td>
</tr>
<tr>
<td>11-15</td>
<td>0.7</td>
</tr>
<tr>
<td>16-20</td>
<td>0.5</td>
</tr>
<tr>
<td>21-25</td>
<td>1</td>
</tr>
<tr>
<td>26+</td>
<td>1</td>
</tr>
</tbody>
</table>

Figures 40. FCS CCATS 0-5
FCS and CCATS 6-10 Day in the Hospital

\[ y = 0.6923x + 11.821 \]
\[ R^2 = 0.5653 \]

Figure 41. FCS CCATS 6-10

FCS and CCATS 11-15 Days in the Hospital

\[ y = 0.6662x + 11.56 \]
\[ R^2 = 0.5229 \]

Figure 42. FCS CCATS 11-15
Figure 43. FCS CCATS 16-20

Figure 44. FCS CCATS 21-25
FCS and CCATS 26+ Days in the Hospital

\[ y = 0.3256x + 84.958 \]

\[ R^2 = 1 \]

Figure 45. FCS CCATS 26+
Chapter VI.

Discussion and Recommendations

The purpose of this mixed method study was to demonstrate that the non-verbal component of art therapy could be used to show cognitive-communication disabilities in TBI patients that were not seen when verbally communicating with them. Functional communication and cognitive-communication in TBI patients were examined through the use of the FCS and the CCATS. It was hypothesized that TBI patients would score high on the functional communication scale even when they scored low on the cognitive-communication scale.

In this study, 26 of the 30 patients scored higher on the FCS than on the CCATS. The average score for these 26 patients on the FCS was 18.9 percent higher than their average score on the CCATS. The results indicate that functional communication skills may seem intact even though cognitive disabilities are present. These results confirm the prediction that TBI patients would score high on the FCS even when scores on the CCATS were low. Cognitive-communication is the ability to use language and underlying processes such as attention, memory, self-awareness, organization, problem solving, and reasoning to communicate (Blosser & Depompei, 2001). The non-verbal component of art therapy utilizes these processes and does not solely focus on receptive and expressive language skills. The results of this study affirm that art therapy and the CCATS can be used to find cognitive-communication disabilities that go unnoticed in TBI patients.
The patients who participated in this study were scored by their gender, age, and length of time in the hospital. There were no significant differences found between these variables. The results indicated a positive relationship between the FCS and CCATS scores regardless of the patient’s gender, age, or number of days in the hospital. This positive relationship affirms that art therapy and the CCATS do have the capacity to score aspects of communication ability.

The outcome of this study supports the research done in 2001 by Blosser and Depompe that found cognitive-communication disorders to be overlooked in TBI patients because of their return to pre-injury level of speech. Following their injury, TBI patients rarely have trouble forming sentences or understanding simple language (Coelho, Ylvisaker & Turkstra, 2005). In this study the patient’s low scores on the CCATS could easily be overlooked because of the high scores on the FCS.

Another finding of this study was the CCATS attested to be an uncomplicated scale to rate. The simplicity of its three-point rating scale and its straightforward definitions allowed the rater to score the art therapy session easily and consistently. Current literature states that the most prevalent cognitive disabilities that long-term survivors of TBI have are attention problems and difficulty remembering (Layton, 1999). The concentration and memory categories on the CCATS focus specifically on these areas of disability and made it easy to determine what the patient’s strengths and weaknesses were.
Standardized assessments use rating scales that focus on specific brain disabilities in which standards have been set for (Hall & Johnston, 1994). Previous studies that have been done with TBI patients have recommended using non-standardized assessment with TBI patients because standard tests for language problems often do not show major language difficulty following TBI (Coelho, Ylvisaker & Turkstra, 2005)(Blosser & Depompeii, 2001). The present study unveiled that art therapy could be used as a non-standardized assessment technique that could assist in creating functional and individualized intervention plans for persons who have experienced a TBI.

This study was limited to TBI patients who were 16 years and older, and who were able to withstand three hours of therapy a day. The ideal study would have been conducted with TBI patient’s who were around the same ages with similar head injuries, and who were in the hospital for approximately the same number of days. One thing that could have been done differently in this study would be to use only one art intervention. Using one art intervention would give a larger comparison group and therefore more information about how the art technique worked with the population. Documentation of the specific type of TBI could have been useful along with whether or not the patient was found by the hospital to be aphasic. Having this information may have made the results more or less valid. In this study, all data was collected, interpreted, and analyzed solely
by the researcher. Having another rater may have made the CCATS more reliable.

**Recommendations**

Up to this point there has been little research done on the use of art therapy with TBI patients. Future research could be done to explore the responses that TBI patients have to different types of art medias. This research could provide information that would help specify art interventions that TBI survivors could benefit from the most. Longitudinal studies with TBI outpatients and art therapy could also be examined as could research with art therapy and children who have suffered a TBI. A large number of veterans have experienced TBI and subsequently suffer PTSD. Literature relating to these veterans and art therapy could be very beneficial to society given its current state. Lastly, further investigation of art therapy and its ability to show cognitive-communication disabilities is needed. Studies with larger samples are needed along with more extensive use of the CCATS protocol.
References


Cicerone, K.D., Dahlberg, C., Kalmar, K. Langenbahn, D. M., Malec, J. F.,
Bergquist et al. (2000). Evidenced-based cognitive rehabilitation:
Recommendations for clinical practice. Arch Phy Med Rehabil, 81, 1596-
1610.

approaches for individuals with traumatic brain injuries. Seminars in

Relationship between verbal memory and language and blunt head injury.

Defense and Veterans Brain Injury Center (2004). Washington DC, Government
Printing Office.

Eisenberg, M., Glueckauf, R.L., Zaretsky, H. (Eds.), The Medical Aspects
New York: Springer Publishing Company.

in individuals with traumatic brain injury. Brain Injury, 18(1), 41-56,
(available at informaworld.com).

assessment of TBI, presented at the annual meeting of the *Missouri Speech and Hearing Association*, Columbia, March


Appendix A:  Functional Communication Interview Protocol

Patient ID #__________     Date Given__________

Instructions to the interviewer: *Numbered questions should be asked as key questions.*

*If necessary use lettered probing questions.*

1. Can you tell me a little bit about what brought you into the hospital?
   a. What type of head injury?
   b. How did it happen?

2. How has your stay been while being at the hospital?
   a. How long have you been here?
   b. Do you like the food?
   c. Have you had any visitors?

3. Before you came to the hospital, what types of things did you like to do for fun?
   a. Did you have any hobbies?
   b. Did you play any sports?
   c. Did you like to do any type of art?
# Appendix B: Functional Communication Scale

Participant: ______________________ RLA level: ___________________

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intelligibility</td>
<td>0 1 2 N</td>
<td>Clear and understandable speech</td>
</tr>
<tr>
<td>2. Rhythm and intonation</td>
<td>0 1 2 N</td>
<td>Efficiently time and delivered</td>
</tr>
<tr>
<td>3. Word usage</td>
<td>0 1 2 N</td>
<td>Precise word choice</td>
</tr>
<tr>
<td>4. Grammar usage</td>
<td>0 1 2 N</td>
<td>Use rules of grammar and variety of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sentences</td>
</tr>
<tr>
<td>5. Revisions</td>
<td>0 1 2 N</td>
<td>Spontaneously self corrects or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>repairs message at request</td>
</tr>
<tr>
<td>6. Relevancy</td>
<td>0 1 2 N</td>
<td>Pertains to the topic an non-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tangential speech</td>
</tr>
<tr>
<td>7. Verbosity</td>
<td>0 1 2 N</td>
<td>Adequate amount of verbal output</td>
</tr>
<tr>
<td>8. Turn-taking</td>
<td>0 1 2 N</td>
<td>Balanced conversational give and take</td>
</tr>
<tr>
<td>9. Initiation</td>
<td>0 1 2 N</td>
<td>Initiates topics during conversation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or answers to questions</td>
</tr>
<tr>
<td>10. Maintenance</td>
<td>0 1 2 N</td>
<td>Sustains conversation with related</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ideas</td>
</tr>
<tr>
<td>11. Cohesiveness</td>
<td>0 1 2 N</td>
<td>Organizes thought sequences and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>connections between sentences</td>
</tr>
<tr>
<td>12. Emotional stability</td>
<td>0 1 2 N</td>
<td>Displays emotion consistent with topic</td>
</tr>
<tr>
<td>13. Attention</td>
<td>0 1 2 N</td>
<td>Participates and concentrates on topic</td>
</tr>
</tbody>
</table>

Total score
Appendix C: Art Therapy Intervention # 1 Protocol

Patient ID #__________    Date Given__________

Media Area: Stamping

Goals:  Promote decision-making
        Improve problem-solving skills
        Increase attention through sequencing
        Build organizational skills
        Increase concentration
        Develop fine and gross motor-skills

Materials:  9 x 12 inch piece of x-ray board, 3-inch square of white paper, construction paper, animal stamps, twelve-color pack of washable markers, glue stick, scissors.

Procedure/Directives:

   Step 1: Have the client choose a focal animal stamp, three coordinating stamps and one color of construction paper.

   Step 2: Give the client the 3-inch square of white paper and the black marker. Have the client ink the large focal stamp and stamp it onto the square.

   Step 3: Provide the client with the 12-pack of markers and ask them to color in the animal they have just stamped.

   Step 4: Give the client the construction paper they had chosen previously, a pair of scissors, the 9 x 12 inch piece of x-ray board, and the glue stick. Have the client cut the piece of construction paper into a square that is larger than the 3-inch square but smaller than 9 x 12 inch x-ray board.

   Step 5: Have the client glue the stamped 3-inch square onto the construction paper square and the construction paper square onto the 9 x 12 inch x-ray board.

   Step 6: Next have the client ink the three coordinating stamps that they chose previously with the colors they feel appropriate for that stamp. Have them stamp it down on the x-ray board as many times as they feel appropriate.

   Step 7: Ask the client if they want to add anything to the artwork.

   Step 8: Have client sign the artwork with their name and the date.

   Step 9: Ask the client why they chose the animal selected as the center focal stamp and if it relates to them in any way.
Appendix D: Art Therapy Intervention # 2 Protocol

Patient ID #__________    Date Given__________

**Media Area:** Stenciling

**Goals:**
- Promote decision-making
- Improve problem-solving skills
- Increase attention through sequencing
- Build organizational skills
- Increase concentration
- Provide language and sensory stimulation
- Develop fine and gross motor-skills

**Materials:** 17 x 14 inch x-ray board, a variety of stencils that may include plants, automobiles, and animals, watercolor paints, a paint brush, a variety of colored tissue paper, water, twelve-color pack of washable markers, a black permanent marker.

**Procedure/Directives:**

Step 1: Ask the client to choose 3-5 stencils that could be put together to form a scene.

Step 2: Give the client a variety of different colored tissue paper and ask them to choose three colors that would work well as the background of the scene.

Step 3: Give the client the piece of 17 x 14 inch x-ray board. Instructed the client to tear the tissue paper into pieces and to organize them on the piece of x-ray board to form their background scene.

Step 4: Give the client a paintbrush and a cup of water and tell them to wet down the tissue paper onto the x-ray board. After covering the entire piece of x-ray board, ask the client to remove the tissue paper that they had just wet down.

Step 5: Have the client organize their stencils onto the x-ray board to create the scene. Give the client the black permanent marker and direct them to stencil in the images.

Step 6: Give the client the twelve-color pack of markers and instruct them to fill in the stenciled images with whatever color they feel appropriate.

Step 7: Ask the client if they want to add anything to the artwork.

Step 8: Have client sign the artwork with their name and the date.

Step 9: Ask the client why they chose the animal selected for their scene and if they related to them in any way.
Appendix E: Art Therapy Intervention #3 Protocol

Patient ID #__________ Date Given__________

Media Area: Drawing/ Painting:

Goals: Promote decision-making
   Improve problem-solving skills
   Increase attention through sequencing
   Build organizational skills
   Increase concentration
   Provide language and sensory stimulation
   Develop fine and gross motor-skills

Materials: 8 x 11 inch watercolor paper, watercolor paint, a variety of animal pictures,
   a paint brush, water, a no.2 pencil with eraser, a black permanent marker.

Procedure/Directives:

   Step 1: Give the client a variety of animal pictures to look at. Have them choose
   one image that they feel relates to them in some way.

   Step 2: Give the client the 8 x 11 inch watercolor paper, and a no.2 pencil. Ask
   them to sketch the animal chosen on the paper. If client is hesitant or
   resistant, offer help.

   Step 3: Give the client the watercolor paints and have them paint in the animal
   and the background.

   Step 4: When the painting is finished give the client the black permanent marker
   and ask them to add in any outline detail they think would enhance the
   picture.

   Step 5: Ask the client if they want to add anything to the artwork.

   Step 6: Have client sign the artwork with their name and the date.

   Step 7: Ask the client why they chose the animal selected and how it relates to
   them.
### Appendix F: Cognitive-Communication Art Therapy Scale Protocol

<table>
<thead>
<tr>
<th>Patient ID #</th>
<th>Date Given</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=not applicable; 0= inappropriate; 1= partially appropriate; 2=appropriate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### A. Problem Solving

**Composition**

- 0
- 1
- 2
- N

**Spatial Relations**

- 0
- 1
- 2
- N

**Placement**

- 0
- 1
- 2
- N

0=inappropriate: objects are unbalanced/asymmetrical
1=partially appropriate: objects partially balanced/symmetrical
2= appropriate: objects are balance/symmetrical

0=inappropriate: objects are omitted
1=partially appropriate: objects are overlapping or floating
2= appropriate: objects are grounded

0=inappropriate: objects are isolated
1=partially appropriate: objects are disjointed/disorganized
2= appropriate: objects are centered/integrated

#### B. Concentration

**Detailing**

- 0
- 1
- 2
- N

**Stroke**

- 0
- 1
- 2
- N

**Pressure**

- 0
- 1
- 2
- N

0=inappropriate: excessive or no detailing
1=partially appropriate: minimal detailing controlled/rigid
2= appropriate: details legitimate and relaxed

0=inappropriate: marks are not connected
1=partially appropriate: marks are sketchy, jagged, or short
2= appropriate: marks are decisive and well controlled

0=inappropriate: marks are inconsistent/incorrect variation
1=partially appropriate: marks are all too heavy or too light
2= appropriate: correct variation of heavy and light marks

#### C. Memory

**Task Sequencing**

- 0
- 1
- 2
- N

**Orientation**

- 0
- 1
- 2
- N

0=inappropriate: cannot identify day, month or year
1=partially appropriate: can identify 1 or 2 of 3 or by looking
2= appropriate: can identify all three independently

**Task Completion**

- 0
- 1
- 2
- N

0=inappropriate: task not completed
1=partially appropriate: task completed incorrectly
2= appropriate: task completed correctly

#### D. Affect

**Eye Contact**

- 0
- 1
- 2
- N

**Color**

- 0
- 1
- 2
- N

0=inappropriate: only 1 color used/no variation
1=partially appropriate: incorrect color variation
2= appropriate: correct color variation

0=inappropriate: nonverbal
1=partially appropriate: responding
2= appropriate: spontaneous
Appendix G: Release Form

PERMIT FOR PHOTOGRAPHY, AUDIO OR VIDEOTAPING

Item requested or Medical Reason(s):
- [ ] Photography
- [ ] Video Tape
- [ ] Audio Tape

Permission is hereby given to photograph, audio or videotape the patient, employee or visitor, with the understanding that such photographs, audio and/or videotape may be used for:

- Name of Attorney or Case
- Journal Name
- Name of Study
- Other Medical Purpose(s) (Please Specify)

Person(s) or class of persons authorized to receive the information: N/A

These records would be maintained as a permanent part of the medical record and will be maintained according to those retention requirements.

PHOTOGRAPHS OF THE PATIENT WILL BE: [ ] CLOTHED [ ] PARTIALLY CLOTHED [ ] UNDRESSED

This authorization is valid for a period of 60 days from the date of completion of this authorization, and may be revoked by me or my legal representative in writing at any time. However, I understand that if I do so, it will not have any effect on any actions that were taken before the revocation was received.

Once my health care information is released, re-disclosure of my health care information by the recipient may no longer be protected by law.

Signature of Patient/Legal Representative

Date/Time

Relationship to Patient

Name of Photographer

Date/Time

Witness

NOTE: For non-medical photographs, videotapes or audiotapes for purposes for use by The MetroHealth Foundation, please refer to the form in Attachment D.