

UNIVERSITY OF OKLAHOMA
GRADUATE COLLEGE

RECOGNITION OF MILD TRAUMATIC BRAIN INJURY AMONG CLINICIANS
AND POTENTIAL EFFECTS ON THE PSYCHOTHERAPEUTIC PROCESS

A DISSERTATION
SUBMITTED TO THE GRADUATE FACULTY
in partial fulfillment of the requirements for the
Degree of
DOCTOR OF PHILOSOPHY

By
JEFFREY ALLEN CHEEK
Norman, Oklahoma
2010

RECOGNITION OF MILD TRAUMATIC BRAIN INJURY AMONG CLINICIANS
AND POTENTIAL EFFECTS ON THE PSYCHOTHERAPEUTIC PROCESS

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

BY

Dr. Terry M. Pace, Chair

Dr. Calvin Stoltenberg

Dr. Rockey Robbins

Dr. Paula McWhirter

Dr. Sowon Hahn

© Copyright by JEFFREY ALLEN CHEEK 2010
All Rights Reserved.

Dedication

For my wife, Yean Nee. You have been, and always will be, the light in my life. You have made me the happiest man in the world and have shown me what true love is. Thank you for your limitless love and for continually believing in me.

Acknowledgements

There are a number of people I wish to thank for making this research possible.

First, I'd like to thank those who participated in this research. This research project would not have been possible without the clinicians in the field who took precious time out of their day to complete the research materials and provide valuable data.

Second, I'd like to thank Dr. Terry Pace who served as my academic advisor and Advisory Committee Chair. Thank you for not only supporting and encouraging me, but also for challenging me both personally and professionally.

Third, I would like to thank the University of Oklahoma, the site from which this research was conducted, and to those who provided funding of this project through the Robberson Research and Creative Endeavors Grant, as well as the SAYEXCO, LLC – Jean B. Saylor, Manager Sooner Heritage Scholarship, made possible through the generosity of The Honorable and Mrs. Frank H. Seay.

Fourth, I'd like to thank everyone who helped in my personal journey, including my amazing cohort who provided endless support to me during both my academic journey as well as my personal journey during this important period of my life.

I'd also like to thank my family, especially my parents, Beth and Mel, who have supported me throughout my life, my wife, Yean Nee, and my daughters, Leslie and Morgan. Thank you for loving and inspiring me to be my best.

Table of Contents

| | |
|-----------------------------------|------|
| List of Tables..... | vii |
| List of Figures..... | viii |
| Abstract..... | ix |
| Chapter 1: Background..... | 1 |
| Definition..... | 2 |
| Effects..... | 3 |
| Recovery..... | 6 |
| The Study..... | 7 |
| Chapter 2: Literature Review..... | 9 |
| Subgroups..... | 9 |
| Treatment Issues..... | 15 |
| Hypotheses..... | 22 |
| Chapter 3: Methods..... | 23 |
| Research Questions..... | 23 |
| Participants..... | 23 |
| Measures and Procedure..... | 25 |
| Study Design..... | 27 |
| Data Analysis..... | 28 |
| Chapter 4: Results..... | 29 |
| Descriptive Statistics..... | 29 |
| Inferential Statistics..... | 31 |

| | |
|-------------------------------------|----|
| Chapter 5: Discussion..... | 33 |
| Findings..... | 33 |
| Limitations..... | 35 |
| Implications for Research..... | 36 |
| Implications for Practice..... | 37 |
| References..... | 42 |
| Appendix A: Research Materials..... | 52 |
| Appendix B: Tables..... | 59 |
| Appendix C: Figures..... | 66 |

List of Tables

| | | |
|----------|----------------------------------------------------------------------------------------------|----|
| Table 1. | Demographic Characteristics of Sample..... | 59 |
| Table 2. | Participants Identifying mTBI in Top Three Concerns by Group after “Intake” Vignette..... | 61 |
| Table 3. | Participants Identifying mTBI in Top Three Concerns by Group after “Intake” Vignette..... | 62 |
| Table 4. | Group 1’s Identification of mTBI in Top Three Concerns by Vignette..... | 63 |
| Table 5. | Group 2’s Identification of mTBI in Top Three Concerns by Vignette..... | 64 |

List of Figures

Figure 1. Number of Clinicians Identifying Potential mTBI in Top Three
Concerns.....66

Figure 2. Clinicians' Expectations for Positive Treatment Outcome after 5th
Session Vignette.....67

Abstract

Traumatic brain injury (TBI) is a significant and prominent disability that affects millions of people every year, ranging widely in severity based on the existence or absence of certain symptoms. More specifically, concussions and other forms of mild TBI (mTBI) have the highest prevalence as they account for about 75% of all TBIs (CDC, 2003), with sequelae occurring in any of several areas of functioning (e.g., emotional, cognitive, relational, personality). Although impairments are likely to attenuate naturally to sub-clinical levels within three months post injury for a majority of individuals, some continue to demonstrate significant problems years after the injury (Hibbard et al., 2001). Sometimes referred to as the “silent epidemic,” mTBI is likely to be present in many clients presenting for psychotherapeutic services but is not always explicitly related to the clinician, thereby creating a potential obstacle to successful treatment. The purpose of the current study was twofold. First, are clinicians able to effectively recognize and identify a client with possible mTBI when provided with symptoms alone without information about a specific traumatic event? Second, does evidence exist to suggest clinicians’ style of clinical judgment has a significant influence upon what information is deemed salient and is therefore utilized in the conceptualization, diagnosis, and treatment of the client?

Forty-nine licensed clinicians were asked to read two separate vignettes of a fictional client presenting for services with several typical mTBI symptoms and asked to complete a related questionnaire about their resulting concerns and

conceptualization of the client. Although data analyses did not support either hypothesis, there was evidence to suggest that the timing of when clinicians obtain relevant salient information may have an impact on whether it is utilized or even recognized. The data also suggested that clinicians may be engaging in specific types of more informal methods of clinical judgment. Results of the study are significant in that they highlight the importance of identifying salient client characteristics, assessing clients for neurological deficits, and how influential such information can be in the psychotherapeutic process and treatment outcome.

Chapter One: Introduction

Background

The Center for Disease Control (CDC, 2005) defines traumatic brain injury (TBI) as “a blow or jolt to the head or a penetrating head injury that disrupts the function of the brain” that can cause short- or long-term sequelae including difficulty with individual functioning. Traumatic brain injury is separated from nontraumatic brain injury in that external trauma to the brain has occurred (Whitehouse, 1994). TBI occurs due to shearing forces of inertia created in the brain during sudden deceleration causing a condition known as diffuse axonal injury (Povlishock, Becker, Cheng, & Vaughn, 1983) in which, generally speaking, the greater the force exerted, the greater the damage experienced. TBI represents a significant and growing disability in the United States and the North American Brain Injury Society (NABIS) has brought awareness to the importance of studying TBI by identifying brain injury as a significant public health concern that requires ongoing research to advance therapeutic interventions (NABIS, 2006). In 1995, estimated direct and indirect costs of traumatic brain injury in the United States reached approximately \$56.3 billion (Thurman, 2001), an amount that is almost assuredly to increase with the rising cost of health care. The top two leading causes of TBI include falls and motor vehicle accidents (Langlois, Rutland-Brown, & Thomas, 2004). Males are approximately one and a half times more likely to sustain a TBI than females, and the age groups at highest risk are newborns to 4 year-olds and 15 to 19 year-olds (Langlois et al., 2004). An estimated 1.5 to 2 million people are injured annually, with as many as 90,000 of these experiencing long-term functional impairments (NIH, 1999). In 1991, the National Health Survey reported that of the 1.54 million affected by

brain injury during the previous year, only 25% actually sought medical care (Sosin, Sniezek, & Thurman, 1996). More recently, the CDC (2005) reported a shocking majority of patients who visit the emergency room for a head or brain injury (79%) are simply treated and released without any follow-up services, an especially alarming number in light of a study by Corrigan, Whiteneck, and Mellick (2004) suggesting that approximately 40% of TBI patients report the need for assistance in their daily functioning (e.g., coping with stress, dealing with emotions, problem-solving skills) even one year post injury.

Definition

Alexander (1995) suggests that the severity of TBI should be defined by the acute injury characteristics rather than severity of sequelae at time points after the injury. TBI can range in severity from “severe,” in which the individual experiences an extended period of unconsciousness or amnesia, to “mild” (mTBI), which is typically associated with a brief disruption in consciousness or mental status directly following injury (CDC, 2005). Severity classifications of mild, moderate, or severe are based on length of coma, duration of posttraumatic amnesia, brainstem function measures, time to respond consistently, neuroimaging, and electrophysiological studies (Cunningham, Chan, Jones, Kamnetz, & Stoll, 2005). Concussions and other forms of mTBI account for about three-fourths of all TBIs that occur every year (CDC, 2003). In 1993, the Mild Traumatic Brain Injury Committee of the Head Injury Interdisciplinary Special Interest Group of the American Congress of Rehabilitation Medicine published its official definition of mTBI. Their definition states that, “A person with mild traumatic brain injury is a person who has had a traumatically induced physiological disruption of brain function” due to the

head being struck, the head striking an object, or the brain experiencing an acceleration/deceleration movement without direct external trauma to the head, and is accompanied by at least one of the following: 1) loss of consciousness for any length of time, 2) any loss of memory for events either immediately before or after the injury, 3) any alteration in mental state immediately after the incident (e.g., dazed), 4) focal neurological deficit(s) that may or may not be transient. The definition further explains that for a diagnosis of mTBI the loss of consciousness cannot exceed 30 minutes, the initial Glasgow Coma Scale must be between 13 and 15, and posttraumatic amnesia cannot be longer than twenty-four hours. It also specifically notes the possibility that neuroimaging evaluations may be normal.

Effects

Direct effects of mTBI can include both organic damage and psychological impairment, and may be irreversible and/or progressive. Organic damage can be produced in the brain even without the individual becoming unconscious or an obvious blow to the head. For example, deceleration or rotational forces that may occur during a motor vehicle accident can cause the brain to strike up against the inside of the skull thereby causing damage. The fact that a focal injury to the brain may not be determined through medical procedures also prevents the realization that damage has occurred. Damage to the frontal and temporal lobes of the brain is most common (Bennett, 1989). Skull fracture is an independent risk factor for neurologically relevant intracranial lesions in patients with mTBI, even in patients lacking clinical signs of cranial bone lesion. Therefore, the absence of clinical signs of skull fracture in an mTBI patient does not rule

out bone injury and the consequent risk of intracranial lesions (Munoz-Sanchez, Murillo-Cabezas, Cayuela-Dominguez, Rincon-Ferrari, Amaya-Villar, & Leon-Carrion, 2009).

TBIs can cause either temporary or permanent damage, and sequelae can include a variety of impairments in physical, emotional, cognitive, or behavioral functioning. Psychological sequelae from mTBI may include cognitive changes in the individual including lack of insight, impaired memory, inflexible thinking, poor attention/concentration, language deficits, word-finding difficulty, decreased arousal, distractibility, and impaired reasoning/problem solving (Bennett, 1989; Judd & Wilson, 2005). For example, it has been reported that mTBI has been shown to have adverse long-term neuropsychological outcomes on subtle aspects of complex attention and working memory (Vanderploeg, Curtiss, & Belanger, 2005). Additionally, changes in self-concept have been reported (Vickery, Gontkovsky, Wallace, & Caroselli, 2006), as well as reduced confidence in ability to perform physical activities in children with TBI (Gagnon, Swaine, Friedman, & Forget, 2005). Emotional sequelae can include changes in the individual's frustration tolerance (Bennett, 1989). It can cause the person to become easily angered (Whitehouse, 1994) or emotionally labile (Bennett, 1989; Judd & Wilson, 2005). Persons with mTBI may experience increased levels of irritability, depression, or anxiety (Bennett, 1989). If the situation surrounding the event that caused the mTBI was traumatic, it is likely that patients may experience strong emotional reactions to the injury (Cicerone, 1989), possibly to the point of meeting criteria for post-traumatic stress disorder (Bryant, Moulds, Guthrie, & Nixon, 2003). Behavioral changes have also been noted in the literature (Judd & Wilson, 2005). For example, individuals who have sustained an mTBI may demonstrate disinhibited behavior, impulsivity, and

acting in a socially inappropriate manner (Bennett, 1989). It is possible for individuals with mTBI to experience changes in their personality as well (Cicerone, 1989). Such changes in personality typically are the result of changes in the brain such as decreased motivation, denial of symptoms/deficits, suspiciousness/paranoia, and a significant decrease in one's awareness of impact on others. However, changes can also result from external influences after an mTBI including learned dependency on others (Bennett, 1989).

Other potential negative sequelae resulting from mTBI can affect the individual more indirectly, such as relationship problems in one's marriage or family may arise (Bennett, 1989; Conoley & Sheridan, 1996; McLaughlin & Carey, 1993), or increased difficulty in the areas of academics and employment (Bennett, 1989). A study by Kennedy, Krause, and Turkstra (2008) documented the academic challenges (i.e., studying, in-class experiences, time management, and psychosocial aspects) reported by adults with TBI, and investigated relationships between these challenges and the physical, cognitive, and psychosocial consequences of TBI. Nearly all college survey respondents in the study reported the need to review material more and a majority reported that others do not understand their problems. In-class experiences of being nervous before tests, forgetting what is said in class, and getting overwhelmed in class were also reported by a majority. Those who reported more physical, cognitive, and psychosocial consequences of their injury also identified more academic challenges. In spite of these findings, nearly half of the respondents had not heard of or had never accessed campus disability services. Similarly, de Pereira (2009) suggested that individuals with TBI exhibit moderate problems in career decision making ability.

Depending upon the individual's specific daily functioning demands (e.g., having a job requiring a great deal of executive functioning ability), he or she may find performance deficits more noticeable (Marshall & Ruff, 1989). In 1996, a longitudinal study by Sander, Kreutzer, Rosenthal, Delmonico, and Young investigated changes in employment status of individuals with TBI three to four years post injury. They found that although there was evidence to suggest that injury severity and employment outcome were inversely related, less than 40% of participants who were employed pre-injury continued to hold employment at any follow-up interval over the period of the study. The authors suggest their findings demonstrate that TBI is likely to have a long-term negative impact on patients' employment and productivity, and underscore the need for post-acute rehabilitation programs.

Recovery

Coetzer (2004) has noted that more individuals survive brain injuries today than ever before. Most make a good physical recovery, but many are left with significant psychosocial difficulties. These disabilities are often subtle but chronic, with significant effects on daily functioning. To the casual observer, the person with a brain injury often appears to have made a complete recovery.

Many patients suffer acute disturbance of brain function immediately after mTBIs, but most recover within three months (Dikmen, McLean, & Temkin, 1986; Hayes & Dixon, 1994; Levin, Mattis, Ruff, Eisenberg, Marshall, Tabbador, High, & Frankowski, 1987; Miller, 1996; Schretlen & Shapiro, 2003). However, those with injuries toward the upper end of mTBI may require months or even years to recover (Levin et al., 1987). As many as 15% of individuals with mTBI continue to have

significant problems after the injury, even though physicians, parents, and teachers may not anticipate complications from mild head injuries (Hibbard, Gordon, Martin, Raskin, & Brown, 2001). A recent study by Lannsjo, Af Geijerstam, Johansson, Bring, and Borg (2009) found that although over half of its sample of mTBI patients reported no remaining injury related symptoms three months after the trauma, a significant minority of patients (24%) reported experiencing three or more symptoms and 10% reported seven or more. Research has shown that whereas some TBI patients improve or remain at the same level of post-injury functioning, there are some individuals who demonstrate an actual decline in functioning over time (Hammond, Grattan, Sasser, Corrigan, Rosenthal, Bushnik, & Shull, 2004). The time course of recovery for a person with mTBI tends to be longer than most professionals expect as a typical case will sometimes require months to recover (Alexander, 1995). However, some continue to experience cognitive and behavioral symptoms long after their injury (Dikmen, Temkin, & Armsden, 1989; Hartlage, Durant-Wilson, & Patch, 2001; Nestvold, Lundar, Blikra, & Lonnum, 1988). Continuing psychological issues have been reported as long as eight years post-injury (Vanderploeg et al., 2005), and even twenty-three years post-injury in some cases (Hessen & Nestvold, 2009).

The Study

Sometimes referred to as the “silent epidemic,” mTBI occurs frequently, yet little is currently known about it. This is especially important in a psychotherapeutic milieu as clinicians will likely work with clients presenting with mental health complaints who have experienced mTBI. However, the client may or may not readily report such information or even know that he or she has experienced a brain injury. Thus, this study

explored the impact of the clinician's role when engaging in psychotherapy with an individual from this population. Of specific interest was the clinicians' ability to identify and conceptualize a client with a possible mTBI from their own perspective. It was thought that by approaching the situation from clinicians' point of view, light would be shed upon a key factor: how a clinician's recognition, judgment, and utilization of salient client characteristics may influence treatment direction and outcome.

The overall purpose of the current study was to inform clinicians, as well as the existing professional literature, of the reasons it is of critical importance that clients are correctly conceptualized, understood, and diagnosed. The research questions addressed were as follows:

1. Are clinicians able to effectively recognize and identify a possible neurological disorder, (e.g., mTBI), when related sequelae are presented alone without the presence of additional information concerning a specific event (e.g., motor vehicle accident)?
2. Is there any evidence to suggest that clinicians' style of clinical judgment have a significant influence upon what information they deem salient and therefore utilize in conceptualization, diagnosis, and treatment of the client?

Chapter Two: Literature Review

The literature on mTBI has been described as “enormous, complex, methodologically flawed, and controversial” (Iverson, 2005). This chapter reviews the pertinent theoretical and empirical literature on specific subgroups with TBI and the myriad of challenges (both direct and indirect) they typically face, as well as the role of psychotherapy in obtaining a positive treatment outcome with this population.

Subgroups

Adult men. TBI is a significant health problem affecting men almost twice as often as women and is often associated with changes in masculine role functioning in life domains such as vocational functioning, sexual and interpersonal functioning, and personal independence, all of which could have serious implications for men’s adjustment post-injury. Good, Schoop, Thomson, Hathaway, Sanford-Martens, Mazurek, and Mintz (2006) conducted the first study to quantitatively examine the potential role of masculinity in men’s recovery from serious injuries. Conceptions of masculinity were investigated for their potential relations to both help-seeking and health outcomes among men who experienced traumatic brain or spinal cord injuries. Results suggested that masculinity-related indicators correlated negatively with attitudes toward psychological help-seeking. Similarly, Schopp, Good, Barker, Mazurek, and Hathaway (2006) studied the relations between traditional masculine role adherence, psychosocial adjustment, and rehabilitation outcomes in men with TBI. Their results revealed significant associations between masculine role adherence and satisfaction with life as masculine role variables were found to correspond to different functional and psychological outcomes. The authors suggested that a better understanding of TBI in adult men provides new

directions for treatment and offers important information about aspects of traditional masculine roles that may enhance or hinder adjustment to injury. Greater awareness and sensitivity to masculine-related attitudes and conflicts may reduce psychological barriers to accepting assistance and promote active engagement in rehabilitation activities. It is also likely to assist in avoiding counterproductive ambivalence and resistance as well as improve the therapeutic working alliance associated with favorable outcomes among men with serious injuries (Good, Schopp, Thompson, Hathaway, Mazurek, & Sanford-Martens, 2008).

Children and adolescents. Traumatic brain injury is a leading cause of death and disability in childhood (Kraus, 1995). In any one year, an estimated 250 out of 100,000 children in the United States experience traumatic brain injury (Anderson, Northam, Hendy, & Wrennall, 2001). Research has shown that childhood TBI can have a significant intellectual and academic consequences as the severity of injury has been shown to have an impact on the child's nonverbal IQ performance as long as six to eight years post injury (Arroyos-Jurado, Paulsen, Ehly, & Max, 2006). Additionally, children with TBI can demonstrate escalating challenging behaviors requiring specialized treatment (Feeney & Ylvisaker, 2008). Similarly, adolescents with TBI often experience social, emotional, and behavioral changes requiring intervention. A study by Plotts, Lasser, and Prater (2008) explored the merits of sandplay approaches for clients with TBI with respect to key features of TBI, including language, communication, and psychosocial and executive function impairments. Sandplay was shown to serve as a useful intervention with TBI clients because of the low verbal demands.

Family and caregivers. Family caregivers of TBI patients are likely to find themselves having to live with someone who differs significantly from the personality and behaviors displayed before the injury (Degeneffe & Olney, 2008). Caregiving of individuals with mTBI has been shown to predict caregiver stress (Oddy, Humphrey, & Uttley, 1978), caregiver burden (Allen, Linn, Gutierrez, & Willer, 1994; Brooks, Campsie, Symington, Beattie, & McKinlay, 1987), psychological distress (Kreutzer, Serio, & Bergquist, 1994), marital adjustment (Peters, Stambrook, & Moore, 1990), and family functioning (Douglas & Spellacy, 2000; Kreutzer et al., 1994). Similarly, time since injury has been shown to predict stress, with studies indicating that caregivers' level of burden increased from the 1st year to the 5th year following injury (Brooks, Campsie, Symington, Beattie, & McKinlay, 1986). Other indirect effects of TBI can include significant negative psychological impact upon the family members as they often provide the greatest amount of support and care to this population (Allen et al., 1994). As a result, they have demonstrated high levels of stress and burden as a caregiver (Douglas & Spellacy, 1996; Kreutzer, Marwitz, & Kepler, 1992). Degeneffe & Lynch (2006) found that approximately 39% of adult siblings of TBI patients demonstrated clinically significant depressive symptoms. Factors related to higher ratings of depression included perceived restrictions in family activities and less accessibility to social support. Similarly, results of research by Falk, von Wendt, and Klang (2008) indicated that families of children with mTBI not only have informational needs about the head injury itself and ways to provide care, but they also require a great deal of emotional support to assist in coping with the emotional burden they experience. Also, researchers suggest that spouses are at greater risk for distress over parents on the premise that spouses experience

a greater role change and parents at least are able to provide support for one another (Leathem, Health, & Woolley, 1996). Research has suggested that TBI can have a negative impact on the person with brain damage, his spouse, and upon the relationship between the two as men with brain injury and their wives typically exhibit an increase in conflict and pathology, most likely due to the brain damage (Kravetz, Gross, Weiler, Ben-Yakar, Tadir, & Stern, 1995).

Athletes. In the world of sports, concussions are notoriously discounted as relatively insignificant by everyone from the trainers and coaches to the athletes themselves and even the physicians. Research by Brady (2006) found that many athletes in the National Football League do not even possess basic and important information regarding concussions, suggesting that they may have experienced an mTBI and not even know a brain injury has occurred. Similarly, a separate study of Canadian hockey players indicated a significant number of players hold misconceptions about concussions as they typically did not know what a concussion is, how such an injury occurs, or know whether or not an athlete experiencing concussion symptoms should continue playing (Cusimano, 2009). According to results of a study by Yard and Comstock (2009), almost 400,000 concussions are experienced by high school athletes in the United States each year. Up to 40.5% of these minor-age athletes return to play prematurely under “return-to-play” guidelines with males (12.6%) being more likely than females (5.9%) to return 1-2 days post injury. Research on sports concussions has been a significant contributor to what is known in the literature about the characteristics and course of recovery from mTBI (Barr, 2007). For example, although an athlete may appear to be free of symptoms after experiencing an mTBI via self-report and neuropsychological testing, a concussion can

cause persistent planning and attention deficits in ecologically valid, complex environments (Fait, McFadyen, Swaine, & Cantin, 2009). Research has also shown an increased incidence of mild cognitive impairment and memory deficits related to a history of mTBI has been observed in a sample of retired athletes (Guskiewicz, Marshall, Bailes, McCrea, Cantu, Randolph, & Jordan, 2005). It has been strongly recommended that all athletes who have suffered an mTBI should discontinue all training and competing until any physical symptoms and cognitive dysfunction have been resolved (Collie, Makdissi, Maruff, Bennell, & McCrory, 2006).

Veterans. TBI has been described as the “signature wound” of Operation Enduring Freedom and Iraqi Freedom (OEF-OIF; Hayward, 2008). The U.S. Defense and Veterans Brain Injury Center has reported that 59% of injured U.S. soldiers returning from Iraq or Afghanistan who are being treated at the Walter Reed Medical Center suffered a TBI while in combat (Okie, 2005). mTBI specifically has become an increasingly high-profile battle injury as it has recently been estimated that approximately 300,000 service members returning from OEF-OIF may have a history of mTBI (Tanielian & Jaycox, 2008) and is believed to be the cause of long-term symptomatic ill health in an unknown proportion of military personnel. A subset of these individuals report a persistent constellation of symptoms, collectively known as postconcussive symptoms, marked by cognitive, emotional, and physical complaints for many months to years after injury. In addition, monitoring of mild head injury is problematic since many, if not most, are not referred to the main clinical centers due in great part to the considerable, inherent risks involved with transporting of the patient (Fear, Jones, Groom, Greenberg, Hull, Hodgetts, & Wessely, 2009). New evidence has suggested that

38.9% of recent veterans with a history of mTBI reported at least one postconcussive symptom within one year after injury (Terrio, 2009). Benge, Pastorek, and Thornton (2009) point out that veterans returning from OEF-OIF often present with probable mTBI and that posttraumatic stress is an important factor when evaluating mTBI in veterans.

Although obviously not exclusive to individuals with brain trauma, there has been significant debate over the years as to whether an individual who sustains an mTBI could experience posttraumatic stress symptoms. The argument that TBI may protect against the development of trauma-related psychopathology arises from the view that brain injury reduces the likelihood that trauma information is encoded and thus is not recalled (Sbordone & Lister, 1995). However, there is now strong evidence that Acute Stress Disorder (ASD) can develop after experiencing an mTBI if the event is perceived as traumatic (Bryant, 2001; Carty, O'Donnell, & Creamer, 2006; Creamer, O'Connell, & Pattison, 2005; Harvey & Bryant, 2000). An ASD diagnosis requires an individual to be exposed to a traumatic event involving actual (or threatened) injury to physical integrity of self or others and an emotional response of intense fear, helplessness, or horror. ASD places a large emphasis on dissociative experiences occurring either during or after the traumatic event. These dissociative experiences can include reduced awareness, a subjective sense of emotional numbing, de-realization, depersonalization, and dissociative amnesia. A diagnosis of ASD requires clinically significant distress or impairment in social, occupational, or other important areas of functioning. Harvey and Bryant (1998) were among the first to investigate rates of ASD in a population of mTBI patients and found that 13% of participants who sustained an mTBI developed ASD within one month of injury. This was seen as comparable with rates seen generally in the

non-mTBI injury population. Results from a more recent study showed a trend toward higher levels of ASD in the mTBI group compared with the non-mTBI group (Broomhall, Clark, McFarlane, O'Donnell, Bryant, Creamer, & Silove, 2009). Their results confirm previous research that ASD can develop after mTBI, and that this group is at risk for poorer long-term psychological adjustment than patients without ASD.

Treatment Issues

Treatment fit. A general view that psychotherapy has little application in a brain-injured population has been fairly common in the past and psychotherapeutic interventions continue to be adjunctive, optional, or even missing altogether. There has been a long historical belief that because of such aforementioned sequelae, individuals with TBI are unfit for and unable to benefit from psychotherapy (Prigatano, 1991). Survivors of TBI have been excluded from psychotherapy for various reasons as many are assumed to be too impaired to participate due to deficits in concentration, memory, verbal abilities, and/or diminished ability to understand the purpose of psychotherapy. Poor self-awareness, memory difficulties, perceptual problems, and impairments of language functions were thought to pose insurmountable obstacles to the clinician working with brain-injured persons. Cicerone (1989) has suggested that due to a certain level of defensiveness and lack of self-awareness, it is not unlikely that he or she may find it difficult to understand and accept new limitations which obviously present a special rehabilitation problem for clinicians. Similarly, Anderson and Tranel (1989) have also noted that patients with head trauma frequently demonstrate unawareness of cognitive and motor impairment and therefore suggest that proper evaluation is necessary in rehabilitation planning.

Fortunately, this view has changed somewhat over the last couple of decades (Coetzer, 2007). Whitehouse (1994) suggests that rather than being unfit for psychotherapy, the mTBI population should be understood as having unique psychotherapeutic needs that can create obstacles for a successful outcome. Harrell and O'Hara (1991) have suggested that this exclusion in part comes from a restrictive view that psychotherapy only involves talking about one's feelings. They believe that many TBI survivors can benefit from psychotherapy, as the clinician assists the client in moving from the role of "victim" to "survivor" through five basic components: structure, motivation, information, acceptance, and skills. In fact, research has shown that although there is evidence to argue that psychological treatment is effective in reducing the severity of psychological symptoms after experiencing mTBI (Bryant et al., 2003; Cicerone, 1989; Miller & Mittenberg, 1998; Prigatano, 1991), more traditional rehabilitative services (e.g., physical therapy) continue to be used more often than nontraditional services such as psychotherapy (Phillips, Greenspan, Stringer, Stroble, & Lehtonen, 2004).

Recovery process. The recovery process from brain injury can be a lengthy and painful process for many survivors. Along with physical and cognitive changes, a range of emotional reactions may occur, including shock, denial, defensiveness, anger, blame, guilt, dependency, depression, frustration, and disempowerment. Individuals may need to drastically alter life goals as a result of injury, and may require external support in setting new goals and letting go of the past. Emotional recovery from TBI involves understanding what has happened, grieving over losses, and developing a sense of acceptance. Clients may likely have to make major changes in their world view as their

entire belief systems may be shaken as a result of the trauma. A qualitative study by Nochi (1997) utilized information gathered by four individuals with TBI through in-depth interviews. The major theme that emerged from these interviews indicated a common feeling of carrying a “void” in their understanding of their past and present, and that these individuals typically attempt to fill this void with stories about the accident and recovery. The author suggests that when working with this population clinicians should take into account the individual’s interpretation of the injury and impact upon one’s perception of self in daily life.

Obstacles to treatment. Psychotherapists often encounter numerous barriers preventing them from entering the phenomenological field of their patients (Prigatano, 1991). Persons with TBI may present with apathy or aggression (Lezak, Howieson, & Loring, 2004) which have the potential to adversely influence the therapeutic relationship. It is often difficult for the individual to comprehend the changes that follow a TBI due to impairments in self-awareness that typically occur; impaired self-awareness following injury is one of the most challenging consequences clinicians encounter (Coetzer, 2004).

One of the main challenges facing clinicians working with clients with mTBI is the forming of a therapeutic alliance. For instance, Judd and Wilson (2005) noted that it may be difficult for the therapist to empathize with a client if the therapist does not fully understand and appreciate the nature of the brain damage that has occurred and the resulting sequelae. Without this knowledge the therapist may believe that the client is being resistant to therapy or is malingering, thereby creating a negative reaction to the client. Additionally, differing opinions between the client and the therapist about the

nature of the presenting problems can also have a negative influence on both the therapeutic alliance and the therapeutic process (Cicerone, 1991). Gans (1983) has addressed the sometimes difficult topic of a clinician's negative feelings toward clients, specifically the feeling of hate. He suggests that the feeling of hate is actually a common occurrence, especially when working with a client with TBI. Poor recent memory, visual agnosia, flat affect, unprovoked aggressiveness, and unpredictable behaviors are just some of the possible obstacles to a good therapeutic alliance. Gans reported that therapists who work with this population describe feelings of devastation, devalued, and demeaned. He further reported that even when clinicians are able to manage and control such impulses, they admit to feelings of guilt for having hateful ideation toward a client, or view it as a personal deficiency as a professional. It is noted that many clients are not resistant or unmotivated to engage in therapy, but are simply unable to respond to traditional rehabilitative efforts. Since the quality of the working alliance from the client's point of view is the best predictor of treatment outcome (Horvath & Symonds, 1991), it is of utmost importance that clinicians demonstrate competence when establishing and maintaining a relationship with a client from this population.

Just as with all clients with differing backgrounds, it is of utmost importance that the clinician seeks to fully understand the client's circumstances and adjust his or her treatment approach accordingly (Judd & Wilson, 2005). Since it is likely that discrepancies will exist for a given client with mTBI between medical objective findings and the client's subjective complaints, it is important to address two specific areas at the beginning of treatment. First, it helps to know what brain injury means to the individual (Nadell, 1991). Second, addressing the client's beliefs about their disability can help the

clinician to gain a better prospective (Cicerone, 1991). Many clients with mTBI may have difficulty coping with their personal reactions to their newly acquired deficits, and once aware of such deficits, it is likely that clients will need help in adjusting to the loss of previous abilities and sense of self (Bennett, 1989). Another typical problematic area for many clients with mTBI is coping with the loss of friends and family that have come to find that the needs of the client have become too burdensome (Bennett, 1989). McLaughlin and Carey (1993) suggest that to help ensure a therapeutic environment and improve the chances of a successful therapeutic outcome, psychotherapy with an mTBI client needs to be goal-oriented, while also communicating negative realities.

Clinician's knowledge of mTBI. Sbordone and Rudd (1986) pointed out that a variety of insidious neurological disorders (such as mTBI) can present as mental health issues; consequently misdiagnosis and inappropriate treatment of this population frequently occurs. Therefore, the authors suggest it would be important for clinicians to have the ability to identify potential underlying neurological disorder in clients presenting with psychological problems. Their study sought to determine if psychologists can recognize an underlying neurological disorder in a series of four vignettes, and whether or not they would refer the client to a neurologist. The authors concluded from participant responses that clinicians need to have a better working knowledge of neurological disorders, as well as a closer working relationship with neurologists and other medical specialists.

The importance of clinicians' recognition of salient client information was suggested in a recent research project by this author (Cheek, 2008). The study sought to determine whether or not clinicians who were provided with a case example of a

fictitious client presenting for services with characteristic direct and indirect symptoms of mTBI would be likely to identify and/or screen for possible neurological deficits without receiving specific information regarding a history of a motor vehicle accident. Results from the study indicated that clinicians were over eight times less likely to identify and hypothesize a possible head or brain injury when one extra sentence about the motor vehicle accident was not included in the vignette, $X^2(1) = 8.194, p < .005$. Instead, they demonstrated a tendency to focus on possible substance abuse issues, personality style, and even malingering traits, all of which were not mentioned in the case example. These findings are important in that they suggest clinicians can differ significantly in their recognitions of salient client characteristics, and may be utilizing more informal methods of clinical judgment. A clinician's ability to recognize a wide variety of salient client characteristics is especially important when working with clients with neurological disorders such as mTBI. The purpose of the current study is not only to attempt to recreate results found by this author's previous study (Cheek, 2008), but to also further explore potential differences in psychologists' clinical judgment that can occur especially when working with clients with unrecognized neurological disorders. In doing so, Garb's (1998) model of clinical judgment was thought to be the best tool to utilize, and will therefore be the foundation upon which to determine why this phenomenon appears to so frequently occur.

Clinical judgment. Garb (1998) proposed two general approaches of clinical judgment: formal and informal. A more formal model of judgment is use by clinicians when they utilize a statistical equation, or a series of "if-then" rules, that can be used to reproduce judgments by other clinicians and therefore have a high level of reliability. A

clinician who uses an informal model of judgment may likely make his or her decisions using cognitive biases. Specifically, a type of cognitive bias known as *confirmatory bias* occurs when certain potentially salient information is ignored that does not support a hypothesis, ambiguous information is interpreted as support for a hypothesis, or when information supporting alternative hypotheses is simply not considered. Research has shown that confirmation bias affects judgments in a wide array of contexts, including clinical settings. Confirmation bias not only affects hypothesis testing strategy, but also how one interacts with others and how others in turn respond. In addition, diagnostic labels can affect the way in which clinicians interpret information. Thus, once clinicians make a diagnosis, the confirmation bias has the potential to influence their subsequent processing of new data, resulting in confirmation of initial diagnostic impressions even if these impressions are contradicted by subsequent data. Parmley (2007) examined the possible effects of confirmation bias in psychodiagnostic assessment. In this study, participants were given two case vignettes and asked to make a diagnosis after reading each one. Results indicated that confirmation bias was influential in the clinicians' diagnoses as they tended to remain consistent with their original diagnosis between time one to time two. Interestingly, even when information about confirmation bias was provided to half of the participants between the first and second vignettes, their performance was not significantly influenced. Lewicka (1998) has suggested that cognitive bias can help explain causal reasoning and judgments in situations of uncertainty. Confirmation bias is utilized as a clinical decision making strategy most likely due to its cognitive simplicity and ease and for its adaptive value.

Hypotheses

Hypothesis 1. The study hypothesized that the results of the aforementioned research project (Cheek, 2008) will be repeated in the current study as clinicians will be shown to be significantly more likely to recognize a possible neurological disorder only when provided with historical information about a specific event.

Hypothesis 2. As suggested by previous research (Garb, 1998; Lewicka, 1998; Parmley, 2007), the study also hypothesized that clinicians will mostly utilize a less formal model of clinical judgment (i.e., confirmatory bias) over a more formal method. Evidence in support of this hypothesis may suggest a reason why clinicians tend not to recognize certain salient client information.

Chapter Three: Method

The overall purpose of the current study was to inform clinicians, as well as the existing professional literature, of the reasons it is of critical importance that clients are correctly conceptualized, understood, and diagnosed.

Research Questions

The research questions addressed were as follows:

1. Are clinicians able to effectively recognize and identify a possible neurological disorder, (e.g., mTBI), when related sequelae are presented alone without the presence of additional information concerning a specific event (e.g., motor vehicle accident)?
2. Is there any evidence to suggest that a clinician's style of clinical judgment has a significant influence upon what information to which they deem salient and therefore utilize in conceptualization, diagnosis, and treatment of the client?

Method

Participants

Actively practicing clinicians located and licensed in the West South Central region of the United States, including Texas, Kansas, and Missouri, were the targeted population for this study. Practitioners licensed in Oklahoma were not sampled as this population had been utilized for this author's similar prior study and were therefore not recruited in an effort to prevent biased data. A convenience sample of potential participants was selected in a pseudorandom manner from current (2009) online published directories of licensed clinicians in each of the three states. It was thought that by choosing this type of selection method the study sample would not only include

participants with a wide range of demographics, but also reduce coverage error while providing a good representation of the population of clinicians in order to generalize the results of the study.

Since the study utilized a questionnaire as the primary method by which to obtain research data from participants, it was estimated that 20% of all mailed research packets would be returned. Therefore, to achieve fifty participants per group (N=100), a desired number of participants estimated to achieve sufficient statistical power, a total of five hundred potential participants were initially contacted to take part in the study. It was also thought that by selecting as large a sample from the population as possible, the more the data would be representative of the entire population thereby reducing sampling error. A twenty percent return rate was considered appropriate, and even conservative, given response rates of over 30% by similar survey studies by Sbordone and Rudd (1986) and Rock (1994). Also, in an effort to maximize the return rate, potential participants were informed that a donation would be made to a popular charity (i.e., United Way Hurricane Recovery Fund) for each completed questionnaire returned. However, despite all efforts and a relatively conservative estimate, only forty-seven usable survey packets were initially returned. As a result, reminder postcards were sent to all five hundred original potential participants, asking them to complete and return their questionnaires if they had not already done so, in an effort to significantly increase the sample size closer to the desired number of participants. Unfortunately, this follow-up effort was relatively ineffective as only two additional survey packets were returned over a span of several months. It was determined that although the response rate was lower than expected, due to time and monetary constraints data collection would cease and statistical analyses

would be conducted with the data collected. Subsequently, the total sample size for this study was 49 participants; Group 1 consisted of twenty-four returned surveys while Group 2 had twenty-five.

Measures and Procedure

Following approval from the University of Oklahoma Institutional Review Board, potential participants were contacted by postal mail with a packet of all research materials (see Appendix A), including a cover letter to introduce the researcher and then provide participants with the importance of participation, purpose of the study, expected completion time, return directions, and contact information. Additionally, a consent form was included to describe the study's procedure, any risks or benefits, assurances of confidentiality, and voluntary nature of the study in an effort to ensure informed consent. Participants were informed that by completing and returning the questionnaire, they are agreeing to participate in the study. Participants were first asked to complete a demographics form to obtain specific relevant information about each clinician. It is important to note that questions were carefully chosen and worded as to not obtain any identifying information to ensure protection of participant identity. After completion of this form, participants were instructed to read the first of two fictitious case examples of a client ("Client X") who is presenting with several complaints, followed by a questionnaire regarding their clinical impressions of the vignette.

Participants were randomly assigned to be a member of either Group 1 or Group 2. Participants of both groups received the exact same vignettes; however, Group 1's first vignette ("Case Example Part 1: The Intake") included one additional sentence within the narrative providing information to the participant of that group that the

fictitious client ("Client X") had been in a motor vehicle accident approximately one year prior, but had not received any medical assistance. (This sentence is highlighted on the copy in Appendix A of this manuscript for identification purposes only and was not highlighted on the participant's copy.) Upon completion of the questionnaire items, participants in both groups were then asked to read a follow-up vignette reporting information gained about Client X through the 5th session ("Case Example Part 2: The 5th Session"). It was at this point that participants in Group 2 received the same sentence previously provided to Group 1 in the intake vignette telling of the client's car accident. After reading the second vignette, all participants were instructed to once again answer the same survey questions they had answered previously. The survey questions were the same for both groups after each vignette.

Questionnaire items initially inquired as to the participants' top three clinical concerns about Client X that they would want to explore further in future sessions that might have the greatest influence on the treatment process. Next, they were asked what, if any, would be the three assessments/tests/batteries they would be most likely to utilize to assist in conceptualizing Client X. Other items queried participants as to which diagnoses they would consider, the methodology they used in choosing this diagnosis, and what information about Client X was deemed most salient and least salient. Finally, participants answered several items regarding their tentative diagnosis of the client, including level of confidence, degree of firmness, influence of prior clinical experiences, attention to empirical research, attending to the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (APA, 2000; DSM-IV-TR) criteria,

likelihood to similarity with fellow clinicians, representativeness to similar clients, and expectations for positive therapeutic outcome.

Despite a lack of availability of a standardized measure of clinical judgment deemed appropriate for the present study's purpose and methodology, questionnaire items were developed based on Garb's (1998) model of clinical judgment. According to the model there are several methods that clinicians can utilize to improve their clinical judgment: 1) clinicians should attend to empirical research when making clinical judgments regarding their clients and the psychotherapy process, 2) clinicians need to be constantly aware of, and seek to overcome, their biases, 3) clinicians should attempt to be as systematic and comprehensive as possible when conducting interviews with clients, 4) clinicians should make regular use of psychological tests and behavioral assessment methods when working with clients, 5) clinicians can improve their clinical judgment by using specific debiasing strategies such as considering alternatives and reducing reliance on memory, and 6) clinicians' use of decision aids, such as DSM criteria and base rates, can enhance clinical judgment.

Study Design

This study was designed to build upon previous work by this author (Cheek, 2008) through the use of an experimental repeated measures comparative design in which there is no one control group, but each of the two experimental groups serves as a control to the other depending upon the point in time of the study.

Potential threats to internal validity that could not be controlled for included the possibility of an external event influencing participants' responses and utilization of non-standardized instrumentation in gathering of data. Additionally, it is recognized that the

use of the same questionnaire after each vignette may have had some influence on participants' responses the second time. Similarly, external validity was thought to have been maximized primarily with use of random assignment of participants to groups to help ensure similarity between the groups so that the results may be generalized beyond this study. Also, cues in the research setting that allow participants to guess the research hypothesis, known as "demand characteristics," were addressed by keeping the study title vague and careful placement of the sentence describing the MVA within the vignettes as to maintain informational flow and not draw too much attention to it. Although the study was not "blind/masked" as the primary researcher was also the sole analyzer of data, both the questionnaire items and scoring of items were designed to ensure objectivity and minimize experimenter bias.

Data Analysis

All data analyses were conducted with PASW Statistics GradPack 18 (SPSS Inc., 200) and included relevant descriptive and inferential statistics to answer the research questions.

Chapter Four: Results

Descriptive Statistics

Overall, the two groups were quite similar in their demographics (see Table 1). The average age of participants in Group 1 was 48.58 (± 12.18) years and ranged between 31 and 77 years of age. Group 2 ranged between 33 and 68 years old with an average age of 49.56 (± 11.22). Thirty-seven and a half percent of Group 1 was male and 62.5% were female, while 41.67% of Group 2 was male with 58.33% female. All of Group 1 identified as Caucasian, whereas a majority (95.83%) of Group 2 did as well. Only one participant from Group 2 (4.17%) reportedly identified as “Other” and indicated a multiracial background. As for professional credentials, 62.5% of Group 1 reported having graduated with a Ph.D., exactly one-third had a Psy.D., and one participant (4.17%) reported being a licensed clinician at the Master’s degree level. Similarly, exactly two-thirds of Group 2 had a Ph.D., 29.17% had a Psy.D., and one (4.17%) had a Master’s degree. A majority of both groups identified themselves as subscribing to a primarily Cognitive-Behavioral orientation of therapy (Group 1 = 37.5%; Group 2 = 29.17%), with Psychodynamic orientation (20.83% for both groups) coming in as second most popular. The remainder of Group 1 identified as Integrative (12.5%), Eclectic (12.5%), Interpersonal (8.33%), Cognitive (4.17%), and Other (4.17%). The remainder of Group 2 reported allegiance to Cognitive (16.67%), Integrative (8.33%), Eclectic (8.33%), Behavioral, (4.17%), Interpersonal (4.17%), Humanistic/Person-centered (4.17%), and Other (4.17%).

Two-thirds of Group 1 reported graduating from a Clinical Psychology program, with 29.17% coming from a Counseling Psychology program and 4.17% reported Other.

Similarly, 79.17% of Group 2 reported graduating from a Clinical program, 16.67% from a Counseling program, and 4.17% from a School Psychology program. When asked for the primary training model of their graduate program, a majority of participants of both groups (66.67%) endorsed Scientist-Practitioner (Boulder/Greyston) with Practitioner a distant second (12.5% for both groups). Group 1 also listed Scholar-Practitioner (8.33%), Other (8.33%), and Clinical Scientist (4.17%). Group 2 included Scholar-Professional (8.33%), Scholar-Practitioner (8.33%), and Other (4.17%). Approximately one-fifth (20.83%) of both groups listed participation in a rotation during internship year that was related to health psychology, behavioral medicine, or neuropsychology, with even fewer (8.33% of both groups) having any postdoctoral training related to these subfields.

Experience as a professional was well distributed. When asked how many years participants in each group have been practicing professionally as a clinician in the field of psychology, 29.17% of Group 1 reported working six to ten years, another 29.17% have worked more than twenty years, exactly one-fourth have worked between eleven to twenty years, and 16.67% have worked only one to five years. Forty-one and two-thirds of Group 2 reported working more than twenty years, 33.33% for eleven to twenty years, 16.67% for six to ten years, and 8.33% for between one to five years. A majority of both groups reported Private Practice as the setting in which they work with clients most often (Group 1 = 62.5%; Group 2 = 54.17%). Of those in Group 1 that did not list private practice, 8.33% work primarily in a community agency, 8.33% at a university/college setting, 8.33% at a hospital, 8.33% in the military, and 4.17% noted Other. In the second group 16.17% listed Other, 12.5% work in a community agency, 8.33% at a university/college, 4.17% in a hospital, and 4.17% in corrections. When asked how many

clients the participants see professionally on average per week, 58.33% of Group 1 reported seeing between twenty-one and thirty clients, exactly one-fourth see eleven to twenty clients, 12.5% see more than forty, and 4.17% meets with thirty-one to forty on average per week. Similarly, most (45.83%) of Group 2 participants reported seeing between twenty-one to thirty clients, 20.83% see between one and ten, 16.17% see thirty-one to forty, 12.5% see eleven to twenty, and 4.17% see more than forty clients on average each week.

Inferential Statistics

Research Question 1. Research Question 1 stated: Are clinicians able to effectively recognize and identify a possible neurological disorder, (e.g., mTBI), when related sequelae are presented alone without the presence of additional information concerning a specific event (e.g., motor vehicle accident; MVA)? Chi square analyses were conducted to analyze the relevant categorical data between both groups after each was provided with information about the MVA. Contrary to previous results (Cheek, 2008), and to what was hypothesized for the present study, data analysis indicated that Group 1 (which *was* provided information about Client X's MVA in the first vignette) was not significantly more likely than Group 2 (which *was not* provided this information) to list possible head/brain injury as one of their top three concerns regarding Client X after reading their respective intake scenarios (15% vs. 12.5%), $X^2(1) = 1.23, p > .05$. Similarly, Group 2 *was not* significantly more likely than Group 1 to list head/brain injury as one of their top three concerns after the 5th Session vignette either (62.5% vs. 34.8%), $X^2(1) = 3.61, p > .05$, however a trend was noted. It is thought that with a sufficient sample size both of these may have likely demonstrated a statistically

significant difference, especially with the latter.

Research Question 2. Research Question 2 stated: Is there any evidence to suggest that clinicians' style of clinical judgment has a significant influence upon what information to which they deem salient and therefore utilize in conceptualization, diagnosis, and treatment of the client? Once again, chi square analyses were conducted and Group 1 saw no significant difference between the first and second vignettes in listing head/brain injury as one of their top three concerns, $X^2(1) = .54, p > .05$. However, a significant increase in Group 2's listing of head/brain trauma as one of their top three concerns did exist between the first and second vignettes, $X^2(1) = 12.8, p < .001$.

Since additional self-report measures were completed by participants relating to their diagnosis of Client X (i.e., confidence, firmness, influence of prior clinical experiences, attention to empirical research, attending to DSM-IV-TR criteria, likelihood to similarity with fellow clinicians, representativeness to similar clients, and expectations for positive therapeutic outcome), differences between Group 1 and 2 were explored in each of these areas specifically after the second vignette due to the significant finding noted above. Independent sample t-tests found no significant differences between the groups on any of the aforementioned areas (p 's $> .05$), except in their expectations for a positive therapeutic outcome for Client X. Group 2 reported significantly lower expected treatment outcomes ($M = 2.646, SD \pm 1.108$) than did their counterparts in Group 1 ($M = 3.591, SD \pm 1.563$) after the second vignette ($t(44) = 2.381, p < .05$).

Chapter Five: Discussion

Findings

Hypothesis 1. Hypothesis 1 was not supported by data obtained from the current study. Data analysis indicated that information about an MVA did not make it significantly more likely for group 1 to identify an increased potential for mTBI. This finding is contrary to findings in a recent similar study by this author (Cheek, 2008). However, it is possible that no significant differences were found due to the smaller than desired sample size.

Hypothesis 2. Hypothesis 2 was also not supported. Data analysis provided no indication for the presence of a confirmation bias. Contrary to expectations, Group 2 demonstrated a significant increase in listing potential brain injury as a top concern for Client X between the intake vignette and the 5th session vignette. If a confirmation bias had existed, Group 2 would not have demonstrated such a change in thought as they would have either ignored or dismissed the information about the MVA introduced in the latter vignette.

The significant increase that was noted in Group 2's listing of head/brain trauma as one of their top three concerns between the first and second vignette suggests that the timing of information received could have been a primary influence upon clinicians' ability to identify a possible mTBI. If the timing of salient client information is a major factor, this finding may have important meaning for clinicians and the psychotherapeutic process, especially in light of the fact that the group that received the key piece of information about Client X's MVA later rather than earlier actually noted possible mTBI in greatest numbers. One possibility is that Group 1, who received the information about

the MVA earlier, may have overlooked it as very little was known about the client at that point and hypotheses/conceptualizations were just beginning to be formed. In addition, the reason why they did not identify potential mTBI in significantly greater numbers after reading the second vignette, as seen in Group 2, may have been because the additional information acted as distracters that lead their thoughts away from this key piece of information. On the other hand, the reason why Group 2 demonstrated such a significant increase between time one and time two may have been the result of consistently gathering somewhat ambiguous information about Client X, with the key piece being provided at the end that worked to complete the puzzle and bring all the pieces together. If this is in fact what did occur, this evidence may suggest to clinicians that it would be prudent to revisit initial information gathered from earlier sessions to assist in developing a more comprehensive conceptualization of clients, and thereby leading to a more accurate diagnosis and successful treatment outcome.

Interestingly, the finding that Group 2 was significantly less likely than Group 1 to expect a positive treatment outcome for Client X may provide additional insight into psychotherapeutic interventions with brain-injured persons. The fact that Group 2, which demonstrated the largest percentage of participants (62.5%) at any point in the study recognizing the potential for the presence of mTBI, thought Client X had a significantly lower chance of a positive treatment outcome may suggest that the historical belief that brain-injured individuals make for poor clients (Prigatano, 1991) may not be a thing of the past as recent literature reports (Coetzer, 2007), but continues to have a significant presence in treatment even today. As proposed by Garb (1998), a clinician may utilize his or her own knowledge structures in making clinical judgments, which can include

beliefs, theories, information retained in one's memory, and scripts. Although no evidence was found in the current study to support the presence of confirmatory bias, Group 2's significantly lower treatment expectations might indicate the presence of other informal methods of clinical judgment, specifically use of a representative heuristic and/or scripts. According to Garb (1998), a *representative heuristic* occurs when a judgment is made by comparing a client to what is understood to be the typical client with a certain disorder, while *scripts* are demonstrated when a clinician has a priori expectations concerning the likelihood of successful treatment outcome for clients with a certain disorder due to his or her own personal beliefs about the disorder. Scripts are concepts of a cognitive nature that explain how we understand events and may tend to be utilized frequently in clinical judgment (Garb, 1998).

Limitations

There were several limitations related to the present study. Limitations included (1) small sample size due to significantly less than expected return rate of surveys, thereby creating low statistical power and effect size, (2) reduced ecological validity related to practical limitations faced by participants due to limited information provided in each case example instead of gathering data on real life interactions with clients, (3) no standardized instruments available to gather the type of data desired, (4) a majority of data was participant self-report, and finally (5) it is noted that Group 2's significant difference in ability to identify the potential presence of an underlying neurological disorder may have been due to recency/primacy effects as the placement of the sentence concerning the MVA in relation to other highly salient information may have ultimately cued the participants to this possibility. However, given the purpose of the study and the

research questions several significant restrictions existed that prevented resolution of these limitations. For example, a real client cannot be randomly assigned to a group of mTBI individuals or non-mTBI individuals, and therefore a fictitious “client” with related presenting symptoms and behavior was deemed most appropriate for the purposes of this study. Additionally, while it is understood that self-report measures are likely to be influenced by bias and a desire to portray one’s self in a positive light, this method was chosen as it was found to be the least intrusive and most efficient. Furthermore, several steps were taken in the methodology of the study to keep the purpose and hypotheses of the study as ambiguous to the participants as possible in an effort to effectively reduce potentially problematic issues related with self-report. As for the number of participants, hindsight indicates that by doubling the number of initially contacted potential participants the desired number of actual participants would likely have been achieved. However, as stated previously, there were both time and monetary restrictions that prevented this from occurring.

Implications for Research

The North American Brain Injury Society (2006) has identified TBI as a significant public health concern requiring continuing research to advance therapeutic interventions. As noted above, the current body of literature on mTBI has been referred to as “enormous” and “complex” (Iverson, 2005), however there is still a great deal of information about brain injury that remains to be discovered. Despite its generally high prevalence in both civilian and non-civilian populations, it continues to be neglected, underdiagnosed, and poorly understood, especially from a psychotherapeutic standpoint. The fact that the body of literature on mTBI has also been identified as

“methodologically flawed” and “controversial” (Iverson, 2005) indicates that the nature of mTBI continues to be a topic of debate with professionals and researchers alike. Future research should take exceptional care in identifying and clarifying specific aspects of mTBI that are not fully understood.

Additionally, more research is needed to achieve a better understanding of how clinical judgment may have an impact on clinicians’ apparent tendency to overlook or dismiss salient client characteristics that could indicate a neurological reason as the basis of their presenting problem(s). Future research may also explore why some clinicians demonstrate a tendency to choose more informal methods of diagnosing and planning treatment over more formal methods. Research focusing on this specific area is likely to achieve crucial information with significant implications for the psychotherapeutic process.

Implications for Practice

Although both hypotheses of the current study were not supported by the data, the broader literature reviewed for this study still suggests a need for additional experience and training in the area of TBI, with special attention on mTBI not only due to its relatively high prevalence and potentially damaging sequelae, but also because of its insidious nature it remains a frequently undetected and underdiagnosed condition. Alexander (1995) has noted several possible reasons as to why mTBI has historically been underdiagnosed and relatively ignored: 1) initial treatment is typically handled by emergency room physicians and rather than neurologists, 2) a majority of mTBI patients have been reported to recover on their own, 3) persistently symptomatic patients are often seen as unpleasant, litigious, and suspicion of malingering is high, 4) psychological

issues can impede regular treatment, and 5) mTBI is not as intellectually compelling when compared with many other disorders or illnesses.

Pontifex, O'Connor, Broglio, and Hillman (2009) point out that in a majority of instances mTBI patients typically experience recovery of functional cognitive performance relatively soon after injury, a body of evidence is now indicating that cognitive function deficits can remain after the initial recovery period. It is important to remember when assessing symptoms post injury to sufficiently take into account the individual's premorbid functioning level (Binder, 1997; Dikmen et al., 1986). Corrigan and Deutsche (2008) found that approximately three-fourths of clients in treatment for substance abuse disorders and severe mental illness had a history of at least one TBI. Interestingly, those with TBI were more likely to be diagnosed also with an Axis II personality disorder. The authors suggest that the results indicate the importance of identifying the presence of TBI in a client's history as this information is likely to have important influences on treatment.

It is imperative that clinicians take a holistic perspective in treatment with this population as each individual's situation is dynamic and contextual depending upon one's worldview and culture. A clinician's use of the biopsychosocial model would be advantageous in terms of identifying and examining each unique individual as not only a biological being, but also as a social and cultural being.

With the knowledge gained by practitioners in the field through this and other studies on the topic, aforementioned special subpopulation groups can be engaged in preventative education. For example, coaches and athletic trainers may be targeted to receive information regarding how concussions can occur, what symptoms to be aware

of, and the impact of repeated concussions. The latter is important as repeated concussions can result in cumulative neuropsychological deficits and lead to lingering symptoms in athletes (Kelley & Rosengerg, 1997). Similarly, those who frequently spend their time around children (e.g., parents, families, and teachers) can also be targeted for preventive and psychoeducational programs. As suggested by Stipanivic, Nolin, Fortin, and Gobeil (2008), major changes in a child's development can occur over the course of time as seen in infants with shaken baby syndrome.

The category of mTBI includes a wide range of trauma variables and severity and the diagnostic precision of the diagnosis is uncertain (Hessen & Nestvold, 2009). Benge and colleagues (2009) support a holistic view of evaluation for potential mTBI, and therefore recommend interdisciplinary treatment teams, including mental health practitioners, psychologists, and physiatrists. Findings from a study by Olver, Posford, and Curran (1996) indicate that interventions will most likely be required for a survivor of TBI throughout his or her lifetime. It has been suggested that cognitive therapy programs, including counseling, vocational support, and adaptive strategy programs, can be especially pragmatic and helpful for this population (Minderhoud, Boelens, Huizenga, & Saan, 1980). Group intervention focusing on coping skills has been demonstrated as an effective treatment for reducing depression in persons with a history of TBI (Anson & Posford, 2006). A skills-based intervention provides a promising approach for adults with traumatic brain injuries in outpatient settings, especially in preventing substance abuse and increasing employment readiness (Vungkhanching, Heinemann, Langley, Ridgely, & Kramer, 2007). Telephone counseling, focusing on symptom management, has also been shown to be an efficient and successful method for reducing chronic

symptoms for those with mTBI (Bell, Hoffman, Temkin, Powell, Fraser, Esselman, Barber, & Dikmen, 2008).

Clinicians must also be mindful of how their thoughts and beliefs can have a significant impact upon treatment and constantly striving for professional improvement. Garb (1998) has provided suggestions on ways clinical judgment can be improved. First, he notes that clinicians should attend to empirical research when making clinical judgments regarding their clients and the psychotherapy process. Second, clinicians need to be constantly aware of, and seek to overcome, their biases. Next, clinicians should attempt to be as systematic and comprehensive as possible when conducting interviews with clients. Also, they should make regular use of psychological tests and behavioral assessment methods when working with clients. Fifth, clinicians can improve their clinical judgment by using specific debiasing strategies such as considering alternatives and reducing reliance on memory. Finally, the use of decision aids, such as DSM criteria and base rates, can enhance clinical judgment.

Knowledge of mTBI is vitally important for clinicians as brain injuries can be a relatively common phenomenon resulting in significant sequelae. Common sequelae following acquired brain injury include problems in maintaining relationships with significant others, and dysexecutive deficits (cognitive difficulties in initiation, planning, organizing, sequencing, and monitoring). Just as with clients with differing backgrounds and from various populations, we as clinicians are ethically bound to not only identify but also to take such differences into account when engaging in psychotherapeutic treatment with individuals with mTBI. Failure to do so is likely to have a significant impact upon

the therapeutic alliance, the direction of treatment, and quite possibly the likelihood of a successful treatment outcome.

References

- Alexander, M. P. (1995). Mild traumatic brain injury: Pathophysiology, natural history, and clinical management. *Neurology*, *45*: 1253-1260.
- Allen, K., Linn, R. T., Gutierrez, H., & Willer, B. S. (1994). Family burden following traumatic brain injury. *Rehabilitation Psychology*, *39*: 29-48.
- Anderson, S. W., & Tranel, D. (1989). Awareness of disease states following cerebral infarction, dementia, and head trauma: Standardized assessment. *The Clinical Neuropsychologist*, *3*: 327-339.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.
- Anderson, V., Northam, E., Hendy, J., & Wrennall, J. (2001). *Developmental neuropsychology: A clinical approach*. Philadelphia, PA: Psychology Press.
- Anson, K., & Ponsford, J. (2006). Who benefits? Outcome following a coping skills group intervention for traumatically brain injured individuals. *Brain Injury*, *20*: 1-13.
- Arroyos-Jurado, E., Paulsen, J. S., Ehly, S., & Max, J. E. (2006). Traumatic brain injury in children and adolescents: Academic and intellectual outcomes following injury. *Exceptionality*, *14*: 125-140.
- Barr, W. B. (2007). Recovering from mild traumatic brain injury: What psychology has learned from sports concussion research. *NYS Psychologist*, *19*: 24-29.
- Bell, K. R., Hoffman, J. M., Temkin, N. R., Powell, J. M., Fraser, R. T., Esselman, P. C., Barber, J. K., & Dikmen, S. (2008). The effect of telephone counseling on reducing post-traumatic symptoms after mild traumatic brain injury: A randomized trial. *Journal of Neurology, Neurosurgery and Psychiatry*, *79*: 1275-1281.
- Benge, J. F., Pastorek, N. J., & Thornton, G. M. (2009). Postconcussive symptoms in OEF-OIF veterans: Factor structure and impact on posttraumatic stress. *Rehabilitation Psychology*, *54*: 270-278.
- Bennett, T. L. (1989). Individual psychotherapy and minor head injury. *Cognitive Rehabilitation*, *7*: 20-25.
- Binder, L. M. (1997). A review of mild head trauma. Part II: Clinical implications. *Journal of Clinical and Experimental Neuropsychology*, *19*: 432-457.
- Brady, D. (2006). A preliminary investigation of active and retired NFL players'

knowledge of concussions. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 66: 5676.

Brooks, D. N., Campsie, L., Symington, C., Beattie, A., & McKinlay, W. (1986). The five year outcome of severe blunt head injury: A relative's view. *Journal of Neurology, Neurosurgery and Psychiatry*, 49: 764-770.

Brooks, D. N., Campsie, L., Symington, C., Beattie, A., & McKinlay, W. (1987). The effects of severe head injury on patient and relative within seven years of injury. *Journal of Head Trauma Rehabilitation*, 2: 1-13.

Broomhall, L. G. J., Clark, C. R., McFarlane, A. C., O'Donnell, M., Bryant, R., Creamer, M., & Silove, D. (2009). Early stage assessment and course of acute stress disorder after mild traumatic brain injury. *The Journal of Nervous and Mental Disease*, 197: 178-181.

Bryant, R. A. (2001). Posttraumatic stress disorder and mild brain injury: Controversies, causes and consequences. *Journal of Clinical & Experimental Neuropsychology*, 23: 718-728.

Bryant, R. A., Moulds, M., Guthrie, R., & Nixon, R. D. V. (2003). Treating acute stress disorder following mild traumatic brain injury. *American Journal of Psychiatry*, 160: 585-587.

Carty, J., O'Donnell, M. L., & Creamer, M. (2006). Delayed-onset PTSD: A prospective study of injury survivors. *Journal of Affective Disorders*, 90: 257-261.

Centers for Disease Control and Prevention (CDC). (2003). National Center for Injury Prevention and Control. Report to congress on mild traumatic brain injury in the United States: Steps to Prevent a Serious Public Health Problem. Atlanta, GA: Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention (CDC). (2005). *Facts about Traumatic Brain Injury*. Available at <http://www.cdc.gov/ncipc/factsheets/jbi.htm>.

Cheek, J. A. (2008). *Assessing for salient client information in psychotherapy*. Unpublished doctoral pre-dissertation, University of Oklahoma.

Cicerone, K. D. (1989). Psychotherapeutic interventions with traumatically brain-injured patients. *Rehabilitation Psychology*, 34: 105-114.

Cicerone, K. D. (1991). Psychotherapy after mild traumatic brain injury: Relation to the nature and severity of subjective complaints. *Journal of Head Trauma Rehabilitation*, 6: 30-43.

Coetzer, B. R. (2004). Grief, self-awareness, and psychotherapy following brain injury.

Illness, Crisis & Loss, 12: 171-186.

- Coetzer, R. (2007). Psychotherapy following traumatic brain injury: Integrating theory and practice. *Journal of Head Trauma Rehabilitation*, 22: 39-47.
- Collie, A., Makdissi, M., Maruff, P., Bennell, K., & McCrory, P. (2006). Cognition in the days following concussion: Comparison of symptomatic versus asymptomatic athletes. *Journal of Neurology, Neurosurgery & Psychiatry*, 77: 241-245.
- Conoley, J. C., & Sheridan, S. M. (1996). Pediatric traumatic brain injury: Challenges and interventions for families. *Journal of Learning Disabilities*, 29: 662-669.
- Corrigan, J. D., & Deutschle, Jr., J. J. (2008). The presence and impact of traumatic brain injury among clients in treatment for co-occurring mental illness and substance abuse. *Brain Injury*, 22: 223-231.
- Corrigan, K. D., Whiteneck, G., & Mellick, D. (2004). Perceived needs following traumatic brain injury. *Journal of Head Trauma and Rehabilitation*, 19: 205-216.
- Creamer, M. C., O'Donnell, M. L., & Pattison, (2005). Amnesia, traumatic brain injury and posttraumatic stress disorder: A methodological inquiry. *Behaviour, Research and Therapy*, 43: 1383-1389.
- Cunningham, J. M., Chan, F., Jones, J., Kamnetz, B., & Stoll, J. A. (2005). Traumatic brain injury rehabilitation. In F. Chan, M. J. Leahy, & J. L. Saunders (Eds.), *Case management for rehabilitation health professionals* (2nd ed., pp. 91-131). Osage Beach, MO: Aspen Professional Services.
- Cusimano, M. D. (2009). Canadian minor hockey participants' knowledge about concussion. *Canadian Journal of Neurological Sciences*, 36: 315-320.
- de Pereira, A. P. A. (2009). Self-awareness and prospective memory in persons with traumatic brain injury: Contributions to career decision making. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 69(9-B): 5773.
- Degeneffe, C. E., & Lynch, R. T. (2006). Correlates of depression in adult siblings of persons with traumatic brain injury. *Rehabilitation Counseling Bulletin*, 49: 130-142.
- Degeneffe, C. E., & Olney, M. F. (2008). Future concerns of adult siblings of persons with traumatic brain injury. *Rehabilitation Counseling Bulletin*, 51: 240-250.
- Dikmen, S., McLean, A., & Temkin, N. (1986). Neuropsychological and psychosocial consequences of minor head injury. *Journal of Neurology, Neurosurgery, and Psychiatry*, 49: 1227-1232.

- Dikmen, S., Temkin, N., & Armsden, G. (1989). Neuropsychological recovery: Relationship to psychosocial functioning and post-concussional complaints. In H. S. Levin, H. M. Eisenberg, & A. L. Benton (Eds.), *Mild head injury*. (pp. 229-241). New York: Oxford University Press.
- Douglas, J. M., & Spellacy, F. J. (1996). Indicators of long-term family functioning following severe traumatic brain injury in adults. *Brain Injury, 10*: 819-839.
- Douglas, J. M., & Spellacy, F. J. (2000). Correlates of depression in adults with severe TBI and their careers. *Disability & Rehabilitation, 22*: 683-689.
- Fait, P., McFadyen, B. J., Swaine, B., & Cantin, J. F. (2009). Alterations to locomotor navigation in a complex environment at 7 and 30 days following a concussion in an elite athlete. *Brain Injury, 23*: 362-369.
- Falk, A.-C., von Wendt, L., & Klang, B. (2008). Informational needs in families after their child's mild head injury. *Patient Education and Counseling, 70*: 251-255.
- Fear, N. T., Jones, E., Groom, M., Greenberg, N., Hull, L., Hodgetts, T. J., & Wessely, S. (2009). Symptoms of post-concussional syndrome are non-specifically related to mild traumatic brain injury in UK Armed Forces personnel on return from deployment in Iraq: An analysis of self-reported data. *Psychological Medicine, 39*: 1379-1387.
- Feeney, T. J., & Ylvisaker, M. (2008). Context-sensitive cognitive-behavioral supports for young children with TBI. *Journal of Positive Behavior Interventions, 10*: 115-128.
- Gagnon, I., Swaine, B., Friedman, D., & Forget, R. (2005). Exploring children's self-efficacy related to physical activity performance after a mild traumatic brain injury. *Journal of Head Trauma Rehabilitation, 20*: 436-449.
- Gans, J. S. (1983). Hate in the rehabilitation setting. *Archives of Physical Medicine & Rehabilitation, 64*: 176-179.
- Garb, H. N. (1998). Clinical judgement. In *Studying the clinician: Judgment research and psychological assessment*. Washington, DC: American Psychological Association.
- Good, G. E., Schopp, L. H., Thomson, D., Hathaway, S. L., Mazurek, M. O., & Sanford-Martens, T. C. (2008). Men with serious injuries: Relations among masculinity, age, and alcohol use.
- Good, G. E., Schopp, L. H., Thomson, D., Hathaway, S., Sanford-Martens, T., Mazurek,

- M. O., & Mintz, L. B. (2006). Masculine roles and rehabilitation outcomes among men recovering from serious injuries. *Psychology of Men & Masculinity, 7*: 165-176.
- Guskiewicz, K. M., Marshall, S. W., Bailes, J., McCrea, M., Cantu, R. C., Randolph, C., & Jordan, B. D. (2005). Association between recurrent concussion and late-life cognitive impairment in retired professional football players. *Neurosurgery, 57*: 719-726.
- Hammond, F. M., Grattan, K. D., Sasser, H., Corrigan, J. D., Rosenthal, M., Bushnik, T., & Shull, W. (2004). Five years after traumatic brain injury: A study of individual outcomes and predictors of change in function. *NeuroRehabilitation, 19*: 25-35.
- Harrell, M., & O'Hara, C. C. (1991). Meeting the emotional needs of brain injury survivors: An empowerment approach to psychotherapy. *Cognitive Rehabilitation, 9*: 12-17.
- Hartlage, L. C., Durant-Wilson, D., & Patch, P. C. (2001). Persistent neurobehavioral problems following mild traumatic brain injury. *Archives of Clinical Neuropsychology, 16*: 561-570.
- Harvey, A. G., & Bryant, R. A. (1998). Acute stress disorder after mild traumatic brain injury. *Journal of Nervous and Mental Disorders, 186*: 333-337.
- Harvey, A. G., & Bryant, R. A. (2000). Two-year prospective evaluation of the relationship between acute stress disorder and posttraumatic stress disorder following mild traumatic brain injury. *American Journal of Psychiatry, 157*: 626-628.
- Hayes, R. L., & Dixon, C. E. (1994). Neurochemical changes in mild head injury. *Seminars in Neurology, 14*: 25-31.
- Hayward, P. (2008). Traumatic brain injury: The signature of modern conflicts. *Lancet Neurology, 7*: 200-201.
- Hessen, E., & Nestvold, K. (2009). Indicators of complicated mild TBI predict MMPI-2 scores after 23 years. *Brain Injury, 23*: 234-242.
- Hibbard, M., Gordon, W. A., Martin, T., Raskin, B., & Brown, M. (2001). Students with traumatic brain injury: Identification, assessment, and classroom accommodations. *Research and Training Center on Community Integration of Individuals with Traumatic Brain Injury, 1-16*.
- Horvath, A. O., & Symonds, B. D. (1991). Relation between working alliance and outcome in psychotherapy: A meta-analysis. *Journal of Counseling Psychology, 38*: 139-149.

- Iverson, G. (2005). Outcome from mild traumatic brain injury. *Current Opinion in Psychiatry, 18*: 301-317.
- Judd, D., & Wilson, S. L. (2005). Psychotherapy with brain injury survivors: An investigation of the challenges encountered by clinicians and their modifications to therapeutic practice. *Brain Injury, 19*: 437-449.
- Kelly, J. P., & Rosenberg, J. H. (1997). Diagnosis and management of concussion in sports. *Neurology, 48*: 575-580.
- Kennedy, M. R. T., Krause, M. O., & Turkstra, L. S. (2008). An electronic survey about college experiences after traumatic brain injury. *NeuroRehabilitation, 23*: 511-520.
- Kraus, J. F. (1995). Epidemiological features of brain injury in children: Occurrence, children at risk, causes and manner of injury, severity, and outcomes. In S. H. Broman & M. E. Michel (Eds.), *Traumatic head injury in children* (pp. 22-39). New York: Oxford University Press.
- Kravetz, S., Gross, Y., Weiler, B., Ben-Yakar, M., Tadir, M., & Stern, M. J. (1995). Self-concept, marital vulnerability and brain damage. *Brain Injury, 9*: 131-139.
- Kreutzer, J. S., Marwitz, J. H., & Kepler, K. (1992). Traumatic brain injury: Family response and outcome. *Archives of Physical Medicine and Rehabilitation, 73*: 771-778.
- Kreutzer, J. S., Serio, C. D., & Bergquist, S. (1994). Family needs after brain injury: A quantitative analysis. *Journal of Head Trauma Rehabilitation, 9*: 104-115.
- Langlois, J. A., Rutland-Brown, W. & Thomas, K. E. (2004). Traumatic brain injury in the United States: Emergency department visits, hospitalizations, and deaths. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.
- Lannsjo, M., Af Beijerstam, J.-L., Johansson, U., Bring, J., & Borg, J. (2009). Prevalence and structure of symptoms at 3 months after mild traumatic brain injury in a national cohort. *Brain Injury, 23*: 213-219.
- Leathem, J., Health, E., & Woolley, C. (1996). Relatives' perceptions of role change, social support and stress after traumatic brain injury. *Brain Injury, 10*: 27-38.
- Levin, H. S., Mattis, S. Ruff, R. M., Eisenberg, H. M., Marshall, L. F., Tabbador, K., High, W. M., & Frankowski, R. F. (1987). Neurobehavioural outcome following minor head injury: A three center study. *Journal of Neurosurgery, 66*: 234-224.
- Lewicka, M. (1998). Confirmation bias: Cognitive error or adaptive strategy of action

- control? In K. Miroslaw, W. Gifford, & S. Grzegorz (Eds.), *Personal control in action: Cognitive and motivational mechanisms* (pp 233-258). New York: Penum Press.
- Lezak, M. D., Howieson, D. B., & Loring, D. W. (2004). *Neuropsychological Assessment* (4th ed.). New York: Oxford University Press.
- Marshall, L. E., & Ruff, R. M. (1989). Neurosurgeon as victim. In H. S. Levin, H. M. Eisenberg, & A. L. Benton (Eds.), *Mild Head Injury*. New York: Oxford University Press.
- McLaughlin, A. M., & Carey, J. L. (1993). The adversarial alliance: Developing therapeutic relationships between families and the team in brain injury rehabilitation. *Brain Injury*, 7: 45-51.
- Mild Traumatic Brain Injury Committee. (1993). Head Injury Interdisciplinary Special Interest Group. Definition of mild traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 8: 86-87.
- Miller, L. (1996). Neuropsychology and pathophysiology of mild head injury and the postconcussion syndrome: clinical and forensic considerations. *The Journal of Cognitive Rehabilitation*, 14: 8-23.
- Miller, L. J., & Mittenberg, W. (1998). Brief cognitive behavioral interventions in mild traumatic brain injury. *Applied Neuropsychology*, 5: 172-183.
- Minderhoud, J. M., Boelens, M. E. M., Huizenga, J., & Saan, R. J. (1980). Treatment of minor head injuries. *Clinical Neurology & Neurosurgery*, 82: 127-140.
- Munoz-Sanchez, M. A., Murillo-Cabezas, F., Cayuela-Dominguez, A., Rincon-Ferrari, M. D., Amaya-Villar, R., & Leon-Carrion, J. (2009). Skull fracture, with or without clinical signs, in mTBI is an independent risk marker for neurosurgically relevant intracranial lesion: A cohort study. *Brain Injury*, 23: 39-44.
- Nadell, J. (1991). Towards an existential psychotherapy with the traumatically brain-injured patient. *Cognitive Rehabilitation*, 9: 8-13.
- National Institutes of Health. (1999). *Report of the NIH consensus development conference on the rehabilitation of persons with traumatic brain injury*. Bethesda, MD: U.S. Department of Health and Human Services.
- Nestvold, K., Lundar, T., Blikra, G., & Lonnum, A. (1988). Head injuries during one year in a Central Hospital in Norway: A prospective study. *Neuroepidemiology*, 7: 134-144.
- Nochi, M. (1997). Dealing with the 'void': Traumatic brain injury as a story. *Disability & Society*, 12: 533-555.

- North American Brain Injury Society (NABIS). (2006). *Brain injury facts*. Available at <http://nabis.org/public/bfacts.shtml>.
- Oddy, M., Humphrey, M., & Uttley, D. (1978). Stress upon the relatives of head-injured patients. *British Journal of Psychiatry*, *133*: 507-517.
- Okie, S. (2005). Traumatic brain injury in the war zone. *New England Journal of Medicine*, *352*: 2043-2047.
- Olver, J. H., Posford, J. L., & Curran, C. A. (1996). Outcome following traumatic brain injury: A comparison between 2 and 5 years after injury. *Brain Injury*, *10*: 841-848.
- Parmley, M. C. (2007). The effects of the confirmation bias on diagnostic decision making. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *67*: 4719.
- Peters, L. C., Stambrook, M., & Moore, A. D. (1990). Differential effects of spinal cord injury and head injury on marital adjustment. *Brain Injury*, *6*: 461-467.
- Phillips, V. L., Greenspan, A. I., Stringer, A. Y., Stroble, A. K., & Lehtonen, S. (2004). Severity of injury and service utilization following traumatic brain injury: The first 3 months. *Journal of Head Trauma Rehabilitation*, *19*: 217-225.
- Plotts, C. Lasser, J., & Prater, S. (2008). Exploring sandplay therapy: Application to individuals with traumatic brain injury. *International Journal of Play Therapy*, *17*: 138-153.
- Pontifex, M. B., O'Connor, P. M., Broglio, S. P., & Hillman, C. H. (2009). The association between mild traumatic brain injury history and cognitive control. *Neuropsychologia*, *47*: 2110-2116.
- Povlishock, J. T., Becker, C. P., Cheng, C. L. Y., & Vaughn, G. W. (1983). Axonal change in minor head injury. *Journal of Neuropathology & Experimental Neurology*, *42*: 225-242.
- Prigatano, G. P. (1991). Disordered mind, wounded soul: The emerging role of psychotherapy in rehabilitation after brain injury. *Journal of Head Trauma Rehabilitation*, *6*: 1-10.
- Rock, D. L. (1994). Clinical judgment survey of mental health professionals: I. An assessment of opinions, ratings, and knowledge. *Journal of Clinical Psychology*, *50*: 941-950.
- Sander, A. M., Kreutzer, J. S., Rosenthal, M., Delmonico, R., & Young, M. E. (1996). A

multicenter longitudinal investigation of return to work and community integration following traumatic brain injury. *Journal of Head Trauma Rehabilitation, 11*: 70-84.

Sbordone, R. J., Liter, J. C., & Pettler-Jennings, P. (1995). Recovery of functioning following severe traumatic brain injury: A retrospective 10-year follow-up. *Brain Injury, 9*: 285-299.

Sbordone, R. J., & Rudd, M. (1986). Can psychologists recognize neurological disorders in their patients? *Journal of Clinical and Experimental Neuropsychology, 8*: 285-291.

Schopp, L. H., Good, G. E., Barker, K. B., Mazurek, M. M., & Hathaway, S. L. (2006). Masculine role adherence and outcomes among men with traumatic brain injury. *Brain Injury, 20*: 1155-1162.

Schrelten, D. J., & Shapiro, A. M. (2003). A quantitative review of the effects of traumatic brain injury on cognitive functioning. *International Review of Psychiatry, 15*: 341-349.

Sosin, D. M., Sniezek, J. E., & Thurman, D. J. (1996). Incidence of mild and moderate brain injury in the United States, 1991. *Brain Injury, 10*: 47-54.

SPSS Inc. (2009). *PASW Statistics GradPack 18* [Computer software]. Chicago: Author.

Stipanivic, A., Nolin, P., Fortin, G., & Gobeil, M.-F. (2008). Comparative study of the cognitive sequelae of school-aged victims of shaken baby syndrome. *Child Abuse & Neglect, 32*: 415-428.

Tanielian, T., & Jaycox, L. H. (2008). *Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery*. Santa Monica, CA: RAND Corporation.

Terrio, H., Brenner, L. A., Ivins, B. J., Cho, J. M., Schwab, K., Scally, K., Bretthauer, R., & Warden, D. (2009). Traumatic brain injury screening: Preliminary findings in a US Army Brigade combat team. *Journal of Head Trauma Rehabilitation, 24*: 14-23.

Thurman, D. (2001). The epidemiology and economics of head trauma. In L. Miller & R. Hayes (Eds.), *Head trauma: Basic, preclinical, and clinical directions*. New York: Wiley and Sons.

Vanderploeg, R. D., Curtiss, G., & Belanger, H. G. (2005). Long-term neuropsychological outcomes following mild traumatic brain injury. *Journal of the International Neuropsychological Society, 11*: 228-236.

- Vickery, C. D., Gontkovsky, S. T., Wallace, J. J., & Caroselli, J. S. (2006). Group psychotherapy focusing on self-concept change following acquired brain injury: A pilot investigation. *Rehabilitation Psychology, 51*: 30-35.
- Vungkhanching, M., Heinemann, A. W., Langley, M. J., Ridgely, M., & Kramer, K. M. (2007). Feasibility of a skills-based substance abuse prevention program following traumatic brain injury. *Journal of Head Trauma Rehabilitation, 22*: 167-176.
- Whitehouse, A. M. (1994). Applications of cognitive therapy with survivors of head injury. *Journal of Cognitive Psychotherapy: An International Quarterly, 8*: 141-160.
- Yard, E. E., & Comstock, R. D. (2009). Compliance with return to play guidelines following concussion in US high school athletes. *Brain Injury, 23*: 888-898.

Appendix A: Research Materials

Demographic Questionnaire

Date: _____ Age: _____ Gender: _____

Ethnicity: (Check as many as appropriate)

____ African-American ____ American Indian ____ Asian ____ Caucasian
____ Hispanic/Latino ____ Other: _____

What are your credentials? (Check only one)

____ Ph.D. ____ Psy.D. ____ Ed.D. ____ Other: _____

To which theoretical orientation do you subscribe or tend to utilize *most* often? (Check only one)

____ Cognitive ____ Behavioral ____ Cognitive/Behavioral ____ Interpersonal
____ Psychodynamic ____ Humanistic/Person-centered ____ Integrative ____ Eclectic
____ Relational/Cultural ____ Other: _____

Which best describes your graduate program area of study? (Check only one)

____ Clinical ____ Counseling ____ School ____ Other: _____

What was the primary training model of your graduate program from which you most recently graduated? (Check only one)

____ Scientist-Practitioner (Boulder/Greyston) ____ Scholar-Professional (Vail)
____ Practitioner ____ Scholar-Practitioner ____ Clinical Scientist
____ Other: _____

Please list the type of rotations you experienced during your internship:

Please list any type of postdoctoral training you have received:

How many years have you been practicing professionally in the field of psychology with your current degree? (Check only one)

__ < 1 year __ 1 – 5 years __ 6 – 10 years __ 11 – 20 years __ > 20 years

How would you best describe the setting in which work with clients a **majority** of your time? (Check only one)

____ Private practice ____ Community agency ____ University/College ____ Hospital
____ University/Hospital ____ Military ____ Corrections ____ Other: _____

How many clients do you currently see professionally **on average per week** not only at your primary place of employment, but all employment? (This should include all clients seen in groups, couples counseling, individually, etc.) (Check only one)

____ 1 – 10 ____ 11 – 20 ____ 21 – 30 ____ 31 – 40 ____ more than 40

Directions: Carefully read the first of two case examples below of a fictitious client. After reading the example, please answer the following questions.

Case Example Part 1: The Intake

You have just completed an intake session with Client X, a 20-year-old Caucasian male who has requested psychotherapeutic services reportedly at the urging of his wife. Client X stated that he and his wife have been married for two years and they have no children. During the intake today, Client X reported that although he does not feel as though he truly needs psychotherapy, he admits to having difficulty managing stress and his emotions, and occasionally feels “down” and “irritable.” Client X reported that he works as a clerk at a local office supply store, and feels sad and angry with himself for not going to college to “have been able to make more of [his] life.” He further reports disliking his job lately as it makes him feel “frustrated.”

Client X reported that his wife frequently complains about his behavior stating that he “acts impulsively” and has a “quick temper.” However, he dismisses these allegations. Client X reported that he and his wife tend to argue more now than they ever did previously. Although Client X reported no physical abuse issues, he did admit to throwing household items on occasion during arguments with his wife. It is these arguments, along with Client X’s suspicions that his wife is having an affair that is reported causing a significant amount of marital discord.

Client X stated that he had a “relatively normal” childhood in which he was an average student. He also stated that he got along “fairly well” with his parents as a child; however, when he was 10 years old his parents reportedly divorced and it was at that time that their relationship declined. Although Client X appears to be in good physical shape, he stated that it is sometimes difficult for him to “get up and moving a lot of the time.” Client X stated that he was in a car accident approximately one year ago, but did not seek any medical assistance.

Overall, the intake session went well, but you have a sense of what may be defensiveness on Client X’s part when you ask him questions.

Directions: Carefully read the second of two case examples below of the same fictitious client. After reading the example, please answer the following questions.

Case Example Part 2: The 5th Session

You have just completed your 5th session with Client X not including the intake session. Client X did not show as scheduled for the 1st session after the intake. When contacted, Client X stated that he had forgotten and would “definitely be there next week.” Client X did show the next week, but repeated a great deal of what he discussed during the intake, seemingly unaware of this fact even when specifically pointed out. Client X also missed his 4th session with you; once again he stated that it had “slipped his mind.”

Information gathered through various channels has provided additional data about Client X. You know that Client X was never diagnosed with ADHD and does not have a Learning Disorder of any kind. Client X states that in his spare time he used to enjoy going out with friends and family, but lately choose to spend time by himself in his garage working on his car. Client X stated that he was in a car accident approximately one year ago, but did not seek any medical assistance.

After further probing over the past 5 sessions on the topic of Client X’s marriage, you find that Client X accepts little, if any, of the blame for his actions and arguments with his wife. He tends to excuse his behavior due to the fact he has a “hunch” that his wife is cheating on him while he is at work; however, when prompted he could not provide any evidence which would suggest it.

You have also spent time over the past 5 sessions exploring Client X’s work situation. Through your work with Client X, you have discovered that he was once close to several of his co-workers at the office supply store and had had a good working relationship with his boss, but that “suddenly everyone turned against [him] one day.” When asked to relate a specific instance which exemplifies his tumultuous relationship with others at work or with his wife, Client X usually thinks for a moment and then quickly changes the subject. At times when he does talk about a certain situation, you notice that his reported behaviors and verbalizations seem quite impulsive.

When asked about his willingness to engage in “homework” assignments outside of sessions, Client X appears to be a little reluctant about the idea, but is generally willing once the potential benefits are discussed. However, although you have been very careful to make the process of setting homework assignments a mutual act between you and Client X, he has not once reported even attempting to engage in the agreed upon assignment. When you ask him to talk about why this is, Client X has a different excuse each time, such as “I just forgot,” “I was really busy,” or “I’m not sure why.”

Overall, Client X seems to have a reduced lack of insight into himself and others. He exhibits decreased frustration tolerance, which you have noticed extends to the therapeutic relationship at times. Finally, his inability to focus and maintain concentration seems to be hindering treatment progress.

Directions: Based on the case example you just read, please answer the following questions to the best of your ability.

1. What are your **top 3 specific concerns** to assess for at this point in the psychotherapeutic process to be able to better conceptualize and understand Client X?

a. _____

b. _____

c. _____

2. What, if any, would be the **top 3 assessments/measures/batteries** that you would be most likely to utilize to **better conceptualize and understand** Client X?

a. _____

b. _____

c. _____

3. Given the information provided in the case example, what **potential diagnoses would you most highly consider** for Client X?

4. Of the potential diagnoses you provided above, which do you feel is the **one best diagnosis** for Client X at this point in treatment?

5. Briefly describe to the best of your ability the **methodology** you used in conceptualizing/diagnosing Client X:

6. At this point in treatment, what information about Client X did you find to be **most influential or highly salient** in the development of your conceptualization/diagnosis? Why?

7. At this point in treatment, what information about Client X did you find to be **least influential or disregarded** in the development of your conceptualization/diagnosis? Why?

(For each of the items below, please circle the **one number** on the line that best indicates your answer.)

8. How **confident** are you that your diagnosis for Client X is the correct diagnosis?

1-----2-----3-----4-----5-----6-----7
Not at all confident Extremely confident

9. How **firm** are you in maintaining the diagnosis you have given to Client X?

1-----2-----3-----4-----5-----6-----7
Not at all firm Extremely firm

10. How much influence did your **own previous clinical experiences** have on your diagnosis of Client X?

1-----2-----3-----4-----5-----6-----7
Absolutely no influence Completely influenced

11. To what extent did you attend to *current empirical research evidence* in diagnosing Client X?

1-----2-----3-----4-----5-----6-----7
Not at all Completely

12. To what extent did you attend to *DSM-IV-TR criteria* in diagnosing Client X?

1-----2-----3-----4-----5-----6-----7
Not at all Completely

13. In your opinion, how likely is it that a *majority of fellow psychologists* would have diagnosed and conceptualized Client X in the same manner you have?

1-----2-----3-----4-----5-----6-----7
Not at all Extremly
likely likely

14. How *representative* is Client X of other clients with whom you have worked *with the same diagnosis*?

1-----2-----3-----4-----5-----6-----7
Not at all Extremly
representative representative

15. How high are your *expectations for a positive therapeutic outcome* for Client X at this point in treatment?

1-----2-----3-----4-----5-----6-----7
Not at all Extremly
likely likely

Appendix B: Tables

Table 1
Demographic Characteristics of Sample

| Variable | % of Group 1 | % of Group 2 |
|------------------------------|--------------|--------------|
| Sex | | |
| Male | 37.5 | 41.7 |
| Female | 62.5 | 58.3 |
| Age (years) | | |
| 31-40 | 33.3 | 25.0 |
| 41-50 | 20.8 | 25.0 |
| 51-60 | 29.2 | 29.2 |
| 61-70 | 12.5 | 20.8 |
| 70 + | 4.2 | 0 |
| Race/Ethnicity | | |
| Caucasian | 100 | 95.8 |
| Other (Multiracial) | 0 | 4.2 |
| Credentials | | |
| Ph.D. | 62.5 | 66.7 |
| Psy.D. | 33.3 | 29.2 |
| Masters | 4.2 | 4.2 |
| Primary clinical orientation | | |
| Cognitive | 4.2 | 16.7 |
| Behavioral | 0 | 4.2 |
| Cognitive-Behavioral | 37.5 | 29.2 |
| Interpersonal | 8.3 | 4.2 |
| Psychodynamic | 20.8 | 20.8 |
| Humanistic/Person-centered | 0 | 4.2 |
| Integrative | 12.5 | 8.3 |
| Eclectic | 12.5 | 8.3 |
| Relational/Cultural | 0 | 0 |
| Other | 4.2 | 4.2 |
| Graduate program | | |
| Clinical | 66.7 | 79.2 |
| Counseling | 29.2 | 16.7 |
| School | 0 | 4.2 |
| Other | 4.2 | 0 |
| Program training model | | |
| Scientist-Practitioner | 66.7 | 66.7 |
| Scholar-Professional | 0 | 8.3 |
| Practitioner | 12.5 | 12.5 |
| Scholar-Practitioner | 8.3 | 8.3 |
| Clinical Scientist | 4.2 | 0 |
| Other | 8.3 | 4.2 |

Table 1 (continued)
Demographic Characteristics of Samples

| Variable | % of Group 1 | % of Group 2 |
|----------------------------------|--------------|--------------|
| Internship rotation | | |
| Neuro/Health Psychology | 20.8 | 20.8 |
| Other | 79.2 | 79.2 |
| Post doctoral experience | | |
| Neuro/Health Psychology | 8.3 | 8.3 |
| Other | 91.7 | 91.7 |
| Years in clinical practice | | |
| < 1 | 0 | 0 |
| 1 - 5 | 16.7 | 8.3 |
| 6 - 10 | 29.2 | 16.7 |
| 11 - 20 | 25.0 | 33.3 |
| > 20 | 29.2 | 41.7 |
| Primary setting of clinical work | | |
| Private practice | 62.5 | 54.2 |
| Community agency | 8.3 | 12.5 |
| University/College | 8.3 | 8.3 |
| Hospital | 8.3 | 4.2 |
| Military | 8.3 | 0 |
| Corrections | 0 | 4.2 |
| Other | 4.2 | 16.2 |
| Average weekly number of clients | | |
| 1 - 10 | 0 | 20.8 |
| 11 - 20 | 25.0 | 12.5 |
| 21 - 30 | 58.3 | 45.8 |
| 31 - 40 | 4.2 | 16.2 |
| > 40 | 12.5 | 4.2 |

Note. – Columns may not sum to 100% because of rounding.

Table 2

Participants identifying mTBI in top three concerns by group after "Intake" vignette.

| <u>Group</u> | <u>mTBI Concern</u> | | |
|---------------------|----------------------------|-----|----|
| | No | Yes | |
| 1 | 18 | 6 | 24 |
| 2 | 21 | 3 | 24 |
| | 39 | 9 | 48 |

Table 3
Participants identifying mTBI in top three concerns by group after “5th Session” vignette.

| Group | mTBI Concern | | |
|--------------|---------------------|-----|----|
| | No | Yes | |
| 1 | 15 | 8 | 23 |
| 2 | 9 | 15 | 24 |
| | 24 | 23 | 47 |

Table 4

Group 1's identification of mTBI in top three concerns by vignette.

| <u>Vignette</u> | <u>mTBI Concern</u> | | |
|-------------------------|----------------------------|-----|----|
| | No | Yes | |
| Intake | 18 | 6 | 24 |
| 5 th Session | 15 | 8 | 23 |
| | 33 | 14 | 47 |

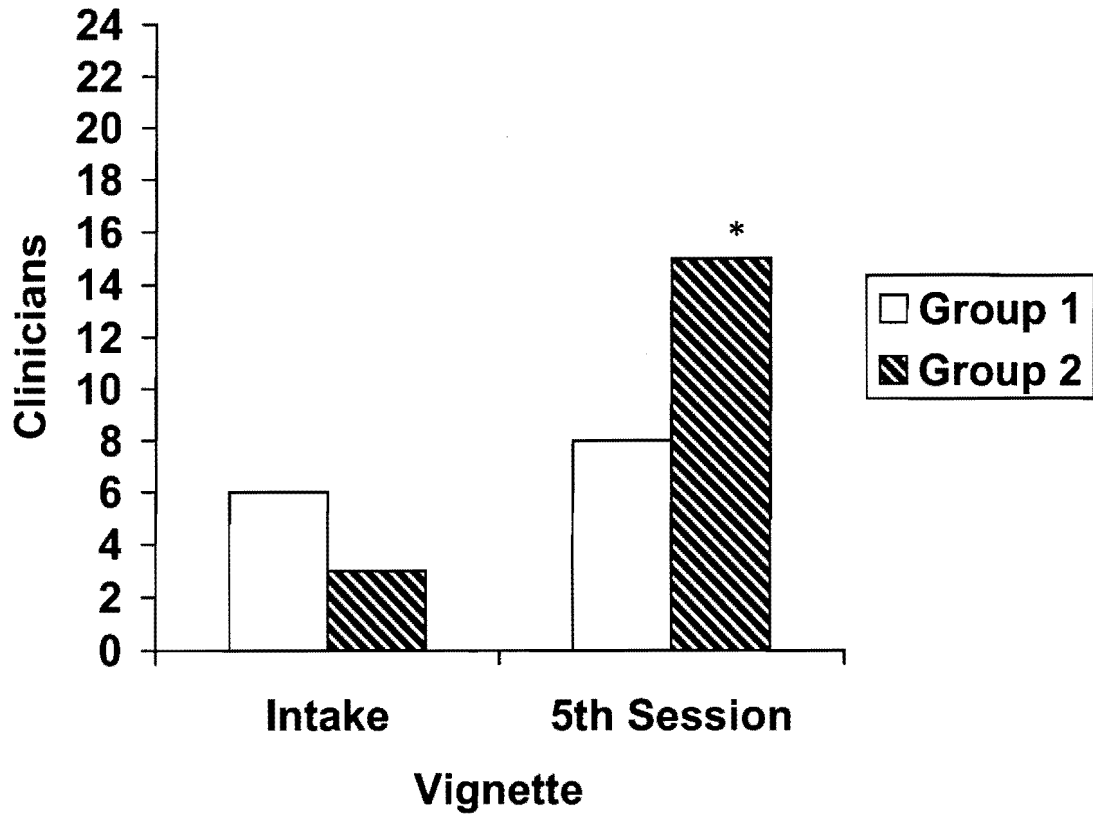
Table 5

Group 2's identification of mTBI in top three concerns by vignette.

| <u>Vignette</u> | <u>mTBI Concerns</u> | | |
|-------------------------|----------------------|-----|----|
| | No | Yes | |
| Intake | 21 | 3 | 24 |
| 5 th Session | 9 | 15 | 24 |
| | 30 | 18 | 48 |

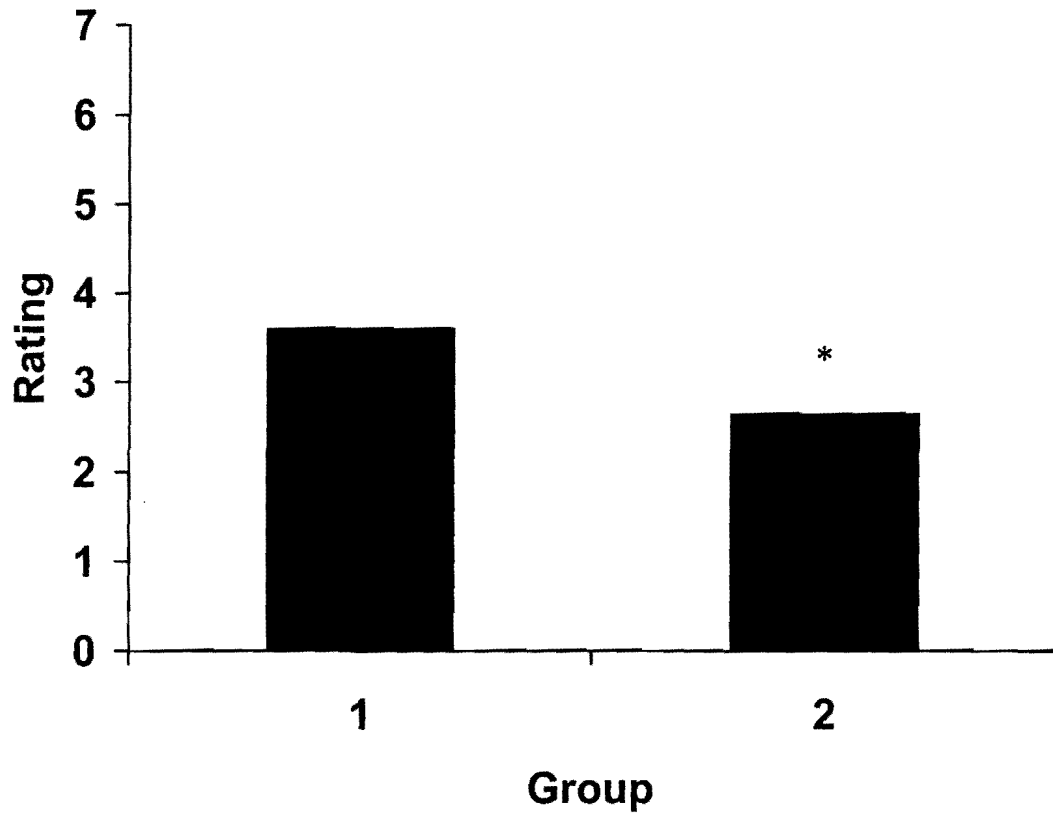
Appendix C: Figures

Figure 1. Number of clinicians identifying potential mTBI in top three concerns.



* $p < .001$

Figure 2. Clinicians' expectations for positive treatment outcome after 5th Session vignette.



* $p < .05$