

QUALITY OF LIFE FOR INDIVIDUALS WITH TRAUMATIC BRAIN INJURY:
THE INFLUENCE OF ATTACHMENT SECURITY AND PARTNER SUPPORT

A DISSERTATION
SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE DEGREE
DOCTOR OF PHILOSOPHY
BY
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BALL STATE UNIVERSITY

MUNCIE, IN

DECEMBER 2016

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Acknowledgments

I could have never completed this dissertation without the assistance, encouragement, and love of so many people. First, I would like to thank my chair and mentor, Kristin McGovern. Working with you has been the high point of my academic career. I have learned so much from you. Thank you from the bottom of my heart! Next I would like to thank my dissertation committee. Donald Nicholas, Molly Tschopp, and Holmes Finch, the three of you have taught me so much. Thank you for guiding me through this process. To all of my wonderful professors at Ball State University, thank you for encouraging me to think critically about research, psychotherapy, teaching, and supervision. I also could have never finished this undertaking without the support of my cohort, colleagues, and classmates at BSU. Thank you! Additionally, I would like to thank my teachers from Pasadena City College, Biola University, and California State University Dominguez Hills. You instilled in me a thirst for knowledge. Thank you for laying the foundation for this work!

This dissertation would never have been possible without the encouragement of my family and friends. To my Burbank friends, lifeguard friends, and Biola friends, thank you for picking me up when I was down and thank you for bringing me back to earth when I was getting carried away with myself. To my brother Derek, I love you so much. Thank you for your kind words and your unwavering belief in me. Mom and Dad, what can I say? The two of you have been the best parents imaginable. You have always loved me, nurtured my interests, and supported my dreams. You are the two most selfless people I know. I am so blessed to have you as parents! And finally, and most importantly, Corie. Thank you Corie. Thank you for your love, encouragement, support, and laughter. You believed in me even when I didn't believe in myself. I am so much stronger, better, and happier because of you. I love you so much!

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Abstract

Traumatic brain injury (TBI) is a condition that can have diverse and wide-ranging effects. Survivors of TBI often experience a unique constellation of symptoms with cognitive, emotional, and physical sequela. The present study sought to elucidate the effects of TBI on romantic relationship satisfaction. A sample of 122 survivors of TBI completed an online survey. All participants were at least 18 years old and were in a romantic relationship of at least six months' duration. Participants were surveyed regarding their attachment security, relationship satisfaction, partner support, and health-related quality of life (HRQOL). Results from a multiple regression analysis indicated that attachment security accounted for a significant amount of variance in HRQOL whereas relationship satisfaction and partner support did not. Additionally, a one-way analysis of variance (ANOVA) was conducted to determine if there were significant differences between male and female survivors of TBI in terms of relationship satisfaction and HRQOL. Results of the one-way ANOVA indicated no gender differences in either variable. Implications for theory and practice and directions for future research are discussed.

Quality of Life for Individuals with Traumatic Brain Injury: The Influence of Attachment Security and Partner Support

The role of counseling psychologists is changing. Increasingly, counseling psychologists are working in more diverse settings with clients experiencing a wide variety of concerns (Constantine, Hage, Kindaichi, & Bryant, 2007). Over the last ten years, there has been an increase in the number of counseling psychologists employed in medical settings such as hospitals, rehabilitation centers, and Veterans' Administration (VA) medical centers (Huang, Lin, & Chang, 2010; Waldrop, 2007). Counseling psychologists that work in medical settings are often part of integrated treatment teams that collaborate to provide evidence-based, holistic patient care (Waldrop, 2007). The fundamental principles of strengths, resiliency, and individual differences enable counseling psychologists to make unique and important contributions to these treatment teams (Goncalves & Perrone-McGovern, 2014). These contributions are especially salient for patients who have experienced an injury that affects both physical and psychological functioning. Traumatic brain injury (TBI) is one such example. The number of people living with a TBI is rising (Faul, Xu, Wald, & Coronado, 2010) and counseling psychologists who work in medical settings are being called on to create treatment plans and rehabilitation programs for survivors of TBI (Fraser & Clemmons, 2000).

Traumatic Brain Injury

TBI has been defined as "An alteration in brain function, or other evidence of brain pathology, caused by an external force" (Menon, Schwab, Wright, & Maas, 2010, p. 1637). TBIs are generally classified by severity (e.g., mild, moderate, and severe; Lezak, Howieson, Bigler, Tranel, 2012). It is estimated that mild TBI (mTBI) accounts for approximately 80% of all TBIs (Rutland-Brown, Langlois, Thomas, & Xi, 2006). This percentage is an approximation

because research has shown that a large number of individuals who sustain mTBI do not receive medical attention (Dikmen, et al., 2009). This has led some researchers to conclude that any estimate of mTBI must be considered an underestimate (Bodin, Yeates, & Klamar, 2012).

Generally, TBI severity is correlated with functional outcomes (Leak et al., 2012). Those that sustain a severe TBI are rarely able to return to their pre-morbid level of functioning (Lezak & O'Brien, 1988). Similarly, TBI severity is strongly correlated with quality of life (QOL).

Persons who sustained a severe TBI were found to have lower appraisals of QOL than were individuals who sustained a moderate or mild TBI (Destailats, Mazaux, & Belio, 2009).

Corrigan, Whiteneck, and Mellick (2004) found that 40% of patients hospitalized with a TBI experienced memory problems, anxiety, depression, and/or irritability one year after injury. Impulsivity is another problem frequently experienced by survivors of TBI (Hibbard, Uysal, Kepler, Bogdany, & Silver, 1998). Depression is particularly salient in this population as a recent study concluded that 53.1% of patients hospitalized for TBI met criteria for major depressive disorder (MDD) during the first year after TBI (Bombardier et al., 2010). There is also an increased risk of suicide subsequent to TBI, as another study reported that 10% of TBI survivors reported suicidal ideation at one year post-TBI, and 15% attempted suicide by five years post-injury (Brooks et al., 1986). The extant literature has demonstrated the functional and psychiatric difficulty that is often subsequent to TBI.

TBI is an acquired condition that can have wide-ranging effects (Rona, 2012). The cognitive, emotional, and physical consequences of TBI can impact many different areas of functioning (Faul et al., 2010). Survivors of TBI can experience changes in relational functioning, educational functioning, and vocational functioning (Snell & Halter, 2010). While protective equipment and modern medicine have saved the lives of many accident victims who

have sustained head injuries, many of these individuals are now living with cognitive, emotional, and physical deficits as a result of their experience (Diedler, Hanson, & O'Riley, 2009).

Survivors of TBI may each possess a unique constellation of symptoms, and science and society are still learning how best to meet the needs of this population (Jagannathan et al., 2007). It is estimated that 5.3 million Americans require assistance with activities of daily living (ADL's) as a result of TBI (Thurman, Alverson, Dunn, Guerrero, & Sniezek, 1999).

Statement of the Problem

TBI is the most frequent cause of brain damage for young adults (Summers et al., 2009). Over 1.7 million Americans sustain a TBI every year and TBIs are responsible for over 53,000 deaths each year in the United States alone (Faul et al., 2010). Through medical expenses, rehabilitation, and lost productivity, TBIs cost the United States approximately \$60 billion annually (Finkelstein, Corso, & Miller, 2006). The occurrence of TBI amongst military personnel in recent years has reached such epidemic proportions that it has been labeled the signature wound of the Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) conflicts (Snell & Halter, 2010). Consequences of TBI vary depending on injury location and severity (Arlinghaus, Shoaib, & Price, 2005). Changes in functioning following a TBI typically occur in three categories: cognitive, emotional, and physical (Halstead & Walter, 2010). Typical cognitive changes are attention deficits, memory problems, and slowed processing speed (Bush, McBride, Curtiss, & Vanderploeg, 2005). Emotional changes frequently manifest as irritability, psychiatric problems, and personality changes (Rao & Lykestos, 2000). Changes in physical functioning are characterized by sensory-motor problems, sleep disturbances, headaches, fatigue, and sensitivity to light and noise (Lezak & O'Brien, 1988). Survivors of TBI may experience changes in one, two, or all three types of functioning. Duration of changes also depends on

location and severity of injury but it is generally accepted that neurologic recovery stabilizes after 12 months (Brooks, McKinlay, Symington, Beattie, & Campsie, 1987; Kaplan, 1993; Katz, Polyak, Coughlan, Nichols, & Roche, 2009).

Common causes of TBIs are falls, vehicle accidents, and firearms (Leon-Carrion, Dominguez-Morales, Barroso, Murillo-Cabezas, 2006). The injury can be a closed head injury (CHI) or it can be a penetrating head injury (PHI). Gunshot wounds are the most common cause of PHI (Kraus & Chu, 2005). TBI is more common in urban areas than it is in rural areas (Gabella, Hoffman, Marine, & Stallones, 1997). TBIs are most frequently sustained by individuals aged 15 to 24 (Love, Tepas, Wludyka, & Masnita-Iusan, 2009). Lower socioeconomic status (SES), unemployment, and lower levels of education are correlated with higher incidence rates of TBI (Lezak et al., 2012). Alcohol and substance abuse have demonstrated high correlations with TBI (Parry-Jones, Vaughan, & Cox, 2006). TBI can produce primary effects that occur at the time of injury and it can also cause secondary or delayed injuries that may take weeks to manifest (Lezak et al., 2012). Secondary injuries such as hemorrhage, hypoxia (decreased oxygen), ischemia (decreased blood supply), and intracranial pressure (ICP) can be as detrimental or more detrimental than primary injuries (Maas, Stocchetti, & Bullock, 2008). Commensurate with counseling psychology's emphasis on strengths, resiliency, and individual differences, the present study examined a potential protective factor: partner support. The extant literature has suggested that partner support is correlated with accelerated recovery from injury and this potential protective factor will now be explored.

Partner Support

Partner support is a specific type of social support that pertains to the level of perceived assistance an individual receives from his or her romantic partner. Research supports the

delineation of partner support into two primary dimensions: instrumental support and emotional support (Declercq, Vanhuele, Markey, & Willemsen, 2007; Semmer, Elfering, Jacobshagen, Beehr, & Boos, 2008). Instrumental support consists of assistance with activities of daily living such as bathing, eating, and dressing. Emotional support is comprised of advocacy and encouragement. The extant literature demonstrates a strong positive correlation between both types of partner support and recovery from injury (Molassiotis, Wilson, Blair, Howe, & Cavet, 2011; Scholz, Knoll, Roigas, & Gralla, 2008). Partner support has also been shown to be highly negatively correlated with depression. When partners are empathic and attentive, this helps to ameliorate feelings of depression in the recipient of the partner support (Stice, Ragan, & Randall, 2004). However, when partners are not sensitive to the needs of the individual this can cause feelings of worthlessness and depression (Karakus & Patton, 2011). Perceptions of instrumental and emotional support were found to be highly correlated with life satisfaction and well-being, such that higher support was related to higher life satisfaction and well-being (Shakespeare-Finch & Obst, 2011). Having outlined the significance of partner support, I will next address the interaction between TBI and HRQOL.

Health-Related Quality of Life

HRQOL has been defined as an individual's perception of his or her physical health and emotional well-being, which includes health risks, social functioning, and functional status (Center for Disease Control and Prevention, 2000). Characteristics of TBI and associated considerations are next discussed in their relationship to HRQOL.

TBI severity. Andelic et al. (2009) concluded that mTBI resulted in higher reported HRQOL than did severe TBI. The authors theorized that survivors of mTBI were more grateful that they were spared from serious injury and therefore they were better adjusted and more

content than were individuals with severe TBI. This finding was in contrast to results reported by Jacobsson et al. (2010). Jacobsson and colleagues reported mTBI produced lower HRQOL rates than did severe TBI. These authors postulated that survivors of mTBI were more cognizant of their deficits and were therefore more likely to experience lower HRQOL. The results of both of these studies are different from those found by Brown and Vandergoot (1998). These authors determined that there were no significant differences between groups. However, these authors acknowledged a limitation in that they assessed HRQOL rather infrequently. It is possible that if they had measured more often, they might have been able to detect differences between groups.

Time since injury. Results for the impact of time since injury on HRQOL were also mixed. Andelic and colleagues (2009) reported that survivors of mTBI experienced lower HRQOL as time progressed. These authors hypothesized that this was due to an increase in depression rates over time. The researchers noted that there was a high depression rate subsequent to TBI (53.1% during the first year) and they theorized that after the individual recovered from the initial blow of their injury, they began to experience greater depression and lower HRQOL. These findings are in opposition to results published by Nestvold and Stavem (2009). These researchers did a longitudinal study of TBI survivors over 22 years and concluded that as time since injury progressed, the survivor experienced increases in HRQOL. One possible reason for the mixed findings of these two studies is that Nestvold and Stavem (2009) measured participants over the course of 22 years while Andelic and colleagues looked at survivors for only ten years post-injury. It is possible that if Andelic et al. continued to examine participants for 12 more years, they may have found results similar to those of Nestvold and Stavem.

Depression. Bombardier and colleagues (2010) examined rates of major depressive disorder (MDD) in survivors of TBI. The authors reported prevalence rates for MDD at one month post-injury and one year post-injury. The authors determined that 20% of TBI survivors experienced MDD at some point during their first month following TBI. They also reported that 53.1% of TBI survivors experienced depression at one time during the first year post-injury. This rate is higher than previous studies and the authors theorized that they observed higher rates of MDD because they assessed for MDD more frequently than did previous researchers and therefore may have been able to be sensitive to transient episodes of MDD. The authors also reported that suicidal ideation was particularly pronounced in survivors of TBI that experienced depression. The authors reported that 10% of TBI survivors that had MDD also had co-morbid suicidal ideation. Additionally, the authors reported that individuals who experienced MDD subsequent to TBI reported lower HRQOL than did TBI survivors that did not experience MDD.

Gender differences. The effects of gender on HRQOL for survivors of TBI were mixed. A study by Lippert-Gruner and colleagues (2007) reported that women had higher rates of depression and lower reported HRQOL than did male survivors of TBI. These findings are contrasted to those of Vogenthaler, Smith, and Goldfader (1989) who concluded that women had better recovery and HRQOL subsequent to TBI than did males. The interaction between TBI and relationship satisfaction will now be examined.

Relationship Satisfaction

Partner stressors. Role changes are some of the most commonly experienced effects for partners of TBI survivors (Gan & Schuller, 2002). Partners often have additional responsibilities thrust upon them such as financial provider, caretaker, and provider of transportation. With these new roles can come confusion, sadness, anger, and resentment (Kreutzer, Marwitz, Hsu,

Williams, & Riddick, 2007). These emotions can lead to caregiver strain (Gosling & Oddy, 1999). In a qualitative study conducted by Kreutzer et al. (2007) several partners of TBI survivors reported they felt like they were less like a spouse than a parent to the survivor following the TBI. With this role change can come other consequences. Gosling and Oddy (1999) reported that TBI had a pronounced effect on couples' sexual relations. These researchers reported that decreased sexual frequency, decreased sexual enjoyment, and erectile dysfunction (ED) were common consequences in male survivors of TBI. Gosling and Oddy (1999) further reported how these consequences affected the spouse of the survivor. The authors reported that wives of TBI survivors often felt neglected, sad, and sexually undesirable as a result of their partner's sexual changes subsequent to TBI.

Patient stressors. As already stated, TBI can have a number of cognitive, emotional, and physical consequences for survivors. These consequences will now be examined in the context of a romantic relationship. Oftentimes, TBI can be co-morbid with post-traumatic stress disorder (PTSD). As a result, these symptoms often impact romantic functioning. Individuals who have survived TBI can be avoidant of their partner, can have difficulty sleeping, and can re-experience the traumatic event (Lezak et al., 2012). All of these factors can have a significant impact on a relationship. Additionally, personality changes can accompany TBI. Sometimes individuals can become more impulsive and/or more hostile. Emotional lability is a frequent consequence of TBI (Faul et al., 2010). Some survivors may even become paranoid and suspect their partner of infidelity (Kreutzer et al., 2007). Other associated problems for survivors of TBI are feelings of guilt and resentment towards the caretaker (Gosling & Oddy, 1999). Another common point of contention amongst couples is the financial strain that frequently results from TBI (Gan & Schuller, 2002). Due to this constellation of symptoms, major depressive disorder

(MDD) is high in survivors of TBI. Bombardier and colleagues (2010) reported that 53% of TBI survivors experienced MDD at some point during the first year after injury. These authors also reported that TBI survivors were at an increased risk for suicide. These consequences can place a very heavy burden on romantic relationships. Having discussed the interaction between TBI and relationship satisfaction, I will now present the conceptual framework for the present study.

Attachment Theory

Attachment theory was first presented in 1969 by John Bowlby. It originally described the interaction between infants and their caregivers. Bowlby defined attachment as affectional bonds between infant and caregiver. The theory maintained that affectional bonds were the result of the infant's need for safety, security, and proximity. Attachment theory described these needs as essential for biological survival and psychological well-being (Bowlby, 1969). Bowlby maintained that the caregiver's response style to these needs created one of three primary emotions in the infant. The three types of attachment were secure, avoidant, anxious/ambivalent. Bowlby theorized that this primary emotion came to represent the nature of the attachment and the relationship itself.

Attachment theory identifies individual differences in mental schemas of the self and others. These schemas evolve out of experiences with close relationships (e.g. maternal figures). These experiences are most significant during times of need. Bretherton (1985) determined that these experiences were instrumental in the regulation of distress and the search for security. These schemas, or working models, organized experiences and guided social interaction and relationships (Bretherton & Munholland, 1999). Bowlby theorized that internal working models were "present and active throughout the life cycle" (Bowlby, 1980, p. 39). He argued that this system of interacting exerted influence "from the cradle to the grave" (Bowlby, 1979, p. 129).

Bowlby (1982) noted that the attachment drive was similarly activated in both children and adults. Situations that posed a threat and situations that pertained to the accessibility of the attachment figure both activated attachment needs in children and adults. When adults experienced separation from their spouses, their responses were very similar to those of infants who were separated from their mothers (Feeney & Kirkpatrick, 1996). A series of studies by Miesen (1992, 1993, 1998) also found similarities between attachment styles in infants and adults. In these studies Miesen examined the needs of infants and the needs of chronically ill adults. These two populations demonstrated very similar attachment patterns.

Hazan and Shaver (1987) presented a model of adult attachment that built upon Bowlby's original findings. About 60% of adults were found to be securely attached, approximately 25% of adults had an avoidant attachment style, and about 15% of adults had anxious/ambivalent attachment patterns (Hazan & Shaver, 1987). These rates were very similar to those found in infants (Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983). Pietromonaco and Barrett (2000) theorized that this similarity was due to inner working models; ways of viewing self and society. These inner working models were developed in response to early caregivers and were generalized to other significant relationships.

Hazan and Shaver (1987) determined that there were four central aspects to adult attachment. The first was that the attachment needed to provide a safe haven. In times of danger or distress, the attachment needed to provide safety and reassurance. The second aspect was that the attachment needed to provide a secure base. This facilitated exploration of self, others, and the world. Hazan and Shaver (1987) determined that a third essential aspect of adult attachment was proximity seeking. This pertained to the availability of the romantic partner and the ability to feel safe in the presence of the romantic partner. The final aspect of adult attachment related

to separation anxiety. Hazan and Shaver (1987) determined that absence from a romantic partner resulted in discomfort and distress. These findings were very similar to an earlier study which assessed separation anxiety in infants (Ainsworth, Blehar, Waters, & Wall, 1978).

Shaver and Mikulincer (2002) found further support for romantic love as an attachment process. Their research supported Bowlby's assertion that maintaining closeness to an attachment figure resulted in protection, support, and relief of distress. Other research provided additional evidence for the adaptation of Bowlby's infant attachment styles to adults. Hazan and Shaver (1987) identified beliefs and behaviors that accompanied each of the attachment patterns. They concluded that securely attached adults tended to view themselves, their partners, and their relationships positively. These individuals balanced intimacy and independence. Adults with an avoidant attachment style were found to be distrusting of and disinterested in romantic relationships. These individuals often suppressed their feelings and viewed themselves as self-sufficient. Adults with an anxious/ambivalent attachment style were found to be worrisome and impulsive. These individuals tended to have negative views of themselves and their partners.

Kobak and Hazan (1991) posited that the primary aim of adult attachment was emotion regulation. Different attachment styles are indicative of different attempts to regulate, control, and mitigate negative affect in primary attachment relationships (Brennan & Shaver, 1995). Sperling and Berman (1994) concluded that adult attachment primarily served to regulate anxiety and anger. These researchers determined, "Once a relationship is identified as an attachment relationship, with the set goal of an optimal level of proximity, attachment is activated by behaviors that convey threat and/or unavailability, or the primary 'attachment' emotions of anxiety and anger" (Sperling & Berman, 1994, p. 215). Scharfe and Bartholomew (1994) concluded that these adult attachment styles remained stable over time.

Purpose and Importance of the Study

The present study examined the effects of TBI on romantic relationships. Individuals who have sustained a TBI and have been involved in a romantic relationship for at least six months completed scales designed to assess their perceptions of attachment security, partner support, HRQOL, and relationship satisfaction. By depicting the relationships between these variables, the current study hopes to fill a gap in the extant literature and therefore create a fuller understanding of the variables that contribute to the recovery from TBI.

The goal of this research was to examine the effect of attachment and partner support on relationship satisfaction and HRQOL for individuals who have sustained a TBI. Secure attachment has been linked to relationship quality in past research (Collins & Read, 1990; Feeney & Noller, 1990) and satisfying romantic relationships have been shown to promote health and well-being (Ryff, Singer, Wing, & Love, 2001). In the present study, I assessed whether a direct effect exists for attachment security on HRQOL as well as relationship satisfaction. Regarding partner support, the research has demonstrated that partner support is correlated with HRQOL (Scholz et al., 2008) but there is still disagreement as to which partner actions are most beneficial (Baik & Adams, 2011; Gustavsson-Lilius, Julkunen, & Hietanen, 2007).

The findings from the present study may extend the TBI and couples literature. The current study also holds clinical significance as there is a paucity of research on interventions for couples facing health concerns. This is evidenced by a meta-analysis conducted by Baik and Adams (2011). The researchers examined couples-based interventions that were health-specific. The authors concluded, “The most appropriate type of intervention for couples facing [illness] is not clear” (Baik & Adams, 2011, p. 262). These findings were further supported by Gustavsson-Lilius et al. (2007). These researchers attempted to identify supportive partner actions that aided

in recovery from health concerns. Summarizing the literature, the researchers concluded, “The impact of partner characteristics on patient quality of life has often been overlooked”

(Gustavsson-Lilius et al., 2007, p. 75).

Hypotheses

H1: I hypothesized that the predictor variables of attachment security, partner support, and relationship satisfaction would account for a significant amount of variance in the criterion variable of HRQOL both together and individually, and that higher levels of the predictor variables will be related to higher levels of the criterion variable.

H2: I hypothesized that female survivors of TBI would have higher levels of relationship satisfaction and HRQOL than male survivors of TBI.

Methods

Participants

To be included in the present study, participants had to have sustained a TBI, be at least 18 years old, be living in the United States, and be in a romantic relationship of at least six months' duration at the time of data collection. Participants included in the analysis were men ($n = 49$) and women ($n = 71$). Two participants did not report their gender. Participants indicated their age by reporting they were either 18-25 ($n = 69$), 26-40 ($n = 26$), 41-55 ($n = 18$), or 56 or older ($n = 9$). The majority of participants identified as Caucasian/White ($n = 106$) and the remaining participants identified as African American ($n = 5$), Multiracial ($n = 4$), Arab ($n = 2$), and Asian/Pacific Islander ($n = 2$). One participant did not report ethnicity. Demographic information for the present sample can be seen in Table 1.

Table 1. *Participant Gender, Age, and Ethnicity*

	<i>n</i>	Percent of Total Sample
Gender		
Men	49	40%
Women	71	58%
Did Not Respond	2	2%
Age		
25 or Younger	69	57%
26-40	26	21%
41-55	18	15%
56 or Older	9	7%
Ethnicity		
Arab	2	2%
Asian/Pacific Islander	2	2%
Black	5	4%
Caucasian/White	106	87%
Hispanic	2	2%
Multiracial	4	3%
Did Not Respond	1	1%

Participants reported they were either married ($n = 35$), living with their romantic partner ($n = 24$), or dating ($n = 63$). Participants reported their time in the current romantic relationship was either 6-12 months ($n = 32$), 1-2 years ($n = 20$), 2-4 years ($n = 20$), 4-6 years ($n = 17$), 6-10 years ($n = 6$), 10-15 years ($n = 12$), 15-20 years ($n = 6$), or greater than 20 years ($n = 9$).

Information about the participants' romantic relationships is presented in Table 2.

Table 2. *Participant Relationship Information*

Relationship Status	<i>n</i>	Percent of Total Sample
Married	35	29%
Living with Romantic Partner	24	20%
Dating	63	51%
Length of Current Romantic Relationship		
6 months-12 months	32	26%
1 year-2 years	20	16%
2 years-4 years	20	16%
4 years-6 years	17	14%
6 years-10 years	6	5%
10 years-15 years	12	10%
15 years-20 years	6	5%
Greater than 20 years	9	8%

The initial data set was comprised of 194 participants. Participants were eliminated from the study if they indicated: they had not sustained a TBI ($n = 2$); were not presently in a romantic relationship of at least six months ($n = 6$); they were not at least 18 years old. Furthermore, participants who did not complete at least 90% of the test battery were not included in the final data analysis ($n = 64$). The final analyzed sample was comprised of 122 participants recruited from Facebook ($n = 91$) and Ball State University (BSU; $n = 31$).

Procedure

Prior to data collection, approval was obtained from BSU's Institutional Review Board (IRB). A goal of the present study was to collect a nationally representative sample of TBI

survivors. As such, Facebook was utilized to recruit participants. A profile was created that offered information and resources for survivors of TBI. The profile hosted a link that directed potential participants to the study's Qualtrics website. Upon entering the Qualtrics site, individuals encountered the study's informed consent and assessment measures. Potential participants were also recruited from other websites and Facebook groups that offered services to TBI survivors. These sites were contacted by the principal investigator and asked to post a link to the Qualtrics website. Individuals who were recruited via Facebook were offered the incentive of having a donation of two dollars made to The Brain Trauma Foundation which is a national charity dedicated to the prevention and treatment of TBI.

In addition to Facebook, participants were also recruited from BSU. At the university, an email (Appendix B) was sent to students, faculty, and staff that were subscribed to the Survey Participation section of Academic Announcements. This email contained information about the study's purpose, procedures, and incentives. Additionally, the email contained a link to a website hosted by Qualtrics. Upon accessing this website, the participant was presented the study's informed consent (Appendix C). Participants indicated that they read and understood the informed consent before they were allowed to participate in the study. The informed consent contained information about the voluntary nature of the study and the participant's right to withdraw at any time. Following the informed consent was a demographics questionnaire (Appendix E). This questionnaire was constructed specifically for this study and contained questions about background history, physical functioning, and medical status. After completion of the demographics questionnaire, participants answered questions on four scales (Appendices F-I). The scales were presented in a counterbalanced order. Following completion of the study,

participants were presented with a debriefing form (Appendix D) that included information about the study and contact information for the primary investigator.

Incentives. Participants enrolled in undergraduate CPSY courses at BSU had their choice of one of two incentives. They could either receive partial credit toward fulfillment of a research requirement or they could have a donation of two dollars made to The Brain Trauma Foundation which is a national charity dedicated to the prevention and treatment of TBI. Participation in the present study was anonymous. The BSU students who requested course credit were provided the primary investigator's email address in the debriefing component of the study. Participants that were not students at Ball State University were offered the incentive of having a donation of two dollars made in their honor to The Brain Trauma Foundation.

Missing data. Concentration problems and fatigue are common problems within the TBI community. To address these issues, succinct and straightforward scales were utilized to collect data. However, even after taking these precautions some scales contained missing data. To help maintain research integrity, participants whose scales were missing 10% or more of the requested information were excluded from the study (Mertler & Vannatta, 2005). For participants with less than 10% missing data, mean substitution was used.

Design

The present study utilized a cross-sectional design as data was collected at one point in time and was compared across two or more groups (Heppner, Wampold, & Kivlighan, 2008). Research of this nature has demonstrated low internal validity but high external validity (Heppner et al., 2008).

Instruments

Demographic questionnaire. A demographic questionnaire was developed for the present study. Participants were asked to provide information about their race, gender, age, relationship status, and employment and medical history.

Experiences in close relationships-revised. Adult attachment was assessed using the Experiences in Close Relationships-Revised scale (ECR-R; Fraley, Waller, & Brennan, 2000). The ECR-R has two subscales; anxiety and avoidance. Each subscale consists of 18 Likert-style items. Point values for each item range from 1 (disagree strongly) to 7 (agree strongly). Higher point values are indicative of greater anxiety or greater avoidance. Fraley and colleagues (2000) reported that the anxiety subscale demonstrated a test-retest reliability of .94 while the avoidance subscale demonstrated a test-retest reliability of .95. The ECR-R also has shown good construct validity as the anxiety subscale has been highly correlated with other scales of anxiety and the avoidance subscale has been correlated with a measure of affectionate proximity (Fairchild & Finney, 2006). Sibley, Fischer, and Liu (2005) also determined that the ECR-R demonstrated strong convergent validity with the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), another reliable measure of attachment security.

Berlin social support scale. Partner support was measured using the Berlin Social Support Scale (BSSS; Schulz & Schwarzer, 2003). The scale was developed for and validated with an adult population with health problems. The BSSS is unique amongst social support scales in that it is a self-report measure that assesses partner support from the recipient's point of view. It is comprised of 14 Likert-style questions. The participants are asked to report how well a statement describes them, with scores ranging from 1 (strongly disagree) to 4 (strongly agree). The BSSS is a particularly relevant measure for individuals with TBI as it instructs participants to respond to the way their partner demonstrated support during the last week. This focused time

period may serve to decrease error in a population that is often characterized by memory problems. The BSSS demonstrated acceptable reliability and validity (Schulz & Schwarzer, 2003; Schulz & Schwarzer, 2004). Internal consistency was reported with Cronbach's Alpha at .83, indicative of a satisfactory level of internal consistency (Schulz & Schwarzer, 2003). Convergent validity was demonstrated through moderate correlations with the Social Support Inventory (SSI; Timmerman, Emanuels-Zuurveen, & Emmelkamp, 2000; Schulz & Schwarzer, 2004).

Kansas marital satisfaction scale. Relationship satisfaction was assessed using the Kansas Marital Satisfaction Scale (KMSS; Schumm, Nichols, Schectman, & Grinsby, 1983). The KMSS was designed to be a brief measure that solely assessed relationship satisfaction. As such, the KMSS is unifactorial. The three items on the KMSS are Likert-style questions. Different versions of the KMSS exist with versions utilizing a 5 point Likert scale being validated as well as a version using a 7 point Likert scale being validated (Schumm, Crock, Likcani, Akagi, & Bosch, 2008). The present study utilized the 7 point iteration of the KMSS. As it only consists of three items, the KMSS is easy to administer and score. The KMSS has demonstrated good concurrent validity (Schumm et al., 1986). It has also demonstrated high internal consistency, good test-retest reliability, and good criterion validity (Schumm et al., 1986). The scale was also determined to have strong predictive validity and good construct validity (Callahan, 1996; Schumm et al., 2008). Additionally, the KMSS was validated for use in a military population (Schumm et al., 2008).

Short-form health survey 36. HRQOL was assessed using the short-form health survey 36 (SF-36; Ware & Sherbourne, 1992). The SF-36 is a self-report measure designed to be completed by individuals 14 years of age or older. It assesses health concerns in eight domains:

1. limitations in physical activities because of health problems; 2. limitations in social activities because of physical or emotional problems; 3. limitations in usual role activities because of physical health problems; 4. bodily pain; 5. general mental health (psychological distress and well-being); 6. limitations in usual role activities because of emotional problems; 7. vitality (energy and fatigue); and 8. general health perceptions. The scale consists of 28 Likert-style items and eight dichotomous (yes/no) items. The individual receives a total score for the overall scale and higher scores signify better HRQOL. The SF-36 is one of the most frequently utilized measures of health concerns (Turner-Bowker, Bartley, & Ware, 2002). It has demonstrated good internal consistency and test-retest reliability (Tsai, Bayliss, & Ware, 1997). A meta-analysis of the SF-36 determined a reliability of at least .80 for 15 studies (Ware, Snow, Kosinski, & Gandek, 1993). Finally, the questionnaire is highly recommended by leading experts as an appropriate tool to measure HRQOL following TBI (Findler, Cantor, Haddad, Gordon, Ashman, 2001; Guilfoyle et al., 2010).

Data Analysis

Multiple regression was used to test the present study's first hypothesis. The general purpose of multiple regression is to learn more about the relationship between several predictor variables and a criterion variable. This fits with the intent of the current study, as it sought to answer the question about whether higher levels of the three predictor variables (relationship satisfaction, attachment security, partner support) collectively and individually accounted for a significant amount of variance in HRQOL. Multiple regression has been demonstrated to be most effective when the predictor variables are correlated with each other and with the criterion variable (Tabachnick & Fidell, 2007). Previous research has demonstrated that there is a relationship between the variables of the present study (Zachariah, 2004). A multiple regression

analysis was conducted using the Statistical Package for Social Sciences (SPSS; Version 22). My second hypothesis was that gender differences would be found for relationship satisfaction and HRQOL, and specifically, that female survivors of TBI would have higher levels of relationship satisfaction and quality of life than male survivors of TBI. To test this hypothesis, a one-way ANOVA was conducted with the independent variable of gender and the dependent variables of relationship satisfaction and HRQOL. SPSS (Version 22) was utilized to conduct this one-way ANOVA.

Results

The purpose of the present study was to elucidate the factors that contribute to quality of life for persons who have sustained a TBI and are in a stable romantic relationship of at least six months' duration. I sought to examine interrelationships between attachment security, partner support, relationship satisfaction and HRQOL.

Preliminary Analyses and Descriptive Information

Preliminary analyses revealed that the current sample had a mean score of 524.12 on the SF-36, which is higher than the normative mean score of 400. This indicates that participants in the current study endorsed higher than average levels of HRQOL. The normative mean score on the ECR-R is 116.64, which is higher than the mean score of the current sample which was 102.99. This indicates that participants in the current study endorsed higher than average levels of attachment security. Participants in the current study had a mean score of 40.79 on the BSSS. This score is representative of moderate partner support. Finally, on the KMSS the mean score for the current sample was 16.43. The cutoff score for the KMSS is 17, indicating that scores less than 17 are representative of relationship distress. The significance of the mean scores of the present study's four variables is discussed in greater detail in the Discussion portion of this paper. Means and standard deviations for the variables in this study are provided in Table 3.

Table 3. *Means and Standard Deviations*

Variable	<i>M</i>	<i>SD</i>	Range
HRQOL	524.12	124.47	490-692
Attachment	102.99	37.69	38-207
Partner Support	40.79	5.69	22-52
Relationship Satisfaction	16.43	4.79	3-21

Correlations between the four variables are presented in Table 4. The three predictor variables (relationship satisfaction, partner support, and attachment) were all significantly correlated with the criterion variable (HRQOL). There was a significant positive correlation between relationship satisfaction and HRQOL. This indicates that TBI survivors with higher levels of relationship satisfaction had higher levels of HRQOL. There was a significant positive correlation between partner support and HRQOL, indicating that TBI survivors with higher levels of partner support in the present study also reported experiencing higher levels of HRQOL. There was a significant negative correlation between attachment insecurity and HRQOL for survivors of TBI. This indicates that TBI survivors with higher levels of attachment security reported higher levels of HRQOL.

Table 4. *Relationship Satisfaction, Partner Support, Attachment Security, and HRQOL*

		RS	PS	AT	HRQOL
RS	Pearson Correlation	1	.502**	-.519**	.369**
	Sig. (2-tailed)		.000	.000	.000
	N	122	122	122	117
PS	Pearson Correlation	.502**	1	-.292**	.219*
	Sig. (2-tailed)	.000		.001	.018
	N	122	122	122	117
AT	Pearson Correlation	-.519	-.292**	1	-.474
	Sig. (2-tailed)	.000	.001		.000
	N	122	122	122	117
HRQOL	Pearson Correlation	.369**	.219*	-.474**	1
	Sig. (2-tailed)	.000	.018	.000	
	N	117	117	117	117
** Correlation is significant at .01					
* Correlation is significant at .05					
RS=relationship satisfaction, PS=partner support, AT=attachment, HRQOL=health-related quality of life					

Additionally, the three predictor variables were assessed for their correlations to the eight components of HRQOL: physical functioning (PF), role limitations due to physical health (RP), role limitations due to emotional problems (RE), energy/fatigue (EN), emotional well-being

(EW) social functioning (SF), pain (PA), and general health (GH).

Table 5. *Domains of Health-Related Quality of Life and Relational Functioning Correlations*

		Correlations											
		RS	PS	AT	HRQOL	PF	RP	RE	EN	EW	SF	PA	GH
RS	Pearson Correlation	1	.502**	-.519**	.369**	.251*	.405**	.163	-.011	.059	.221**	.271**	.189
	Sig. (2-tailed)		.000	.000	.000	.005	.000	.073	.906	.515	.015	.003	.037
	N	122	122	122	117	122	117	122	122	122	122	122	122
PS	Pearson Correlation	.502**	1	-.292*	.219	.092	.181	.096	.104	.042	.143	.269**	.153
	Sig. (2-tailed)	.000		.001	.018	.316	.051	.293	.256	.647	.116	.003	.092
	N	122	122	122	117	122	117	122	122	122	122	122	122
AT	Pearson Correlation	-.519**	-.292*	1	-.474**	-.240*	-.328**	-.270*	-.166	-.096	-.478**	-.249*	-.270*
	Sig. (2-tailed)	.000	.001		.000	.008	.000	.003	.067	.295	.000	.006	.003
	N	122	122	122	117	122	117	122	122	122	122	122	122
HRQOL	Pearson Correlation	.369**	.219	-.474**	1	.708**	.775**	.567**	.026	.230	.741**	.722**	.602**
	Sig. (2-tailed)	.000	.018	.000		.000	.000	.000	.777	.013	.000	.000	.000
	N	117	117	117	117	117	117	117	117	117	117	117	117
PF	Pearson Correlation	.251*	.092	-.240*	.708**	1	.504**	.073	-.098	.047	.505**	.611**	.445**
	Sig. (2-tailed)	.005	.316	.008	.000		.000	.422	.283	.604	.000	.000	.000
	N	122	122	122	117	122	117	122	122	122	122	122	122
RP	Pearson Correlation	.405**	.181	-.328**	.775**	.504**	1	.406**	-.027	.114	.397**	.458**	.306**
	Sig. (2-tailed)	.000	.051	.000	.000	.000		.000	.772	.220	.000	.000	.001
	N	117	117	117	117	117	117	117	117	117	117	117	117
RE	Pearson Correlation	.163	.096	-.270*	.567**	.073	.406**	1	.136	.195	.293**	.084	.095
	Sig. (2-tailed)	.073	.293	.003	.000	.422	.000		.136	.031	.001	.359	.300
	N	122	122	122	117	122	117	122	122	122	122	122	122
EN	Pearson Correlation	-.011	.104	-.166	.026	-.098	-.027	.136	1	.065	-.023	-.069	-.079
	Sig. (2-tailed)	.906	.256	.067	.777	.283	.772	.136		.480	.804	.448	.386
	N	122	122	122	117	122	117	122	122	122	122	122	122
EW	Pearson Correlation	.059	.042	-.096	.230	.047	.114	.195	.065	1	.118	.098	.127
	Sig. (2-tailed)	.515	.647	.295	.013	.604	.220	.031	.480		.194	.283	.162
	N	122	122	122	117	122	117	122	122	122	122	122	122
SF	Pearson Correlation	.221**	.143	-.478**	.741**	.505**	.397**	.293**	-.023	.118	1	.574**	.443**
	Sig. (2-tailed)	.015	.116	.000	.000	.000	.000	.001	.804	.194		.000	.000
	N	122	122	122	117	122	117	122	122	122	122	122	122
PA	Pearson Correlation	.271**	.269**	-.249*	.722**	.611**	.458**	.084	-.069	.098	.574**	1	.490**
	Sig. (2-tailed)	.003	.003	.006	.000	.000	.000	.359	.448	.283	.000		.000
	N	122	122	122	117	122	117	122	122	122	122	122	122
GH	Pearson Correlation	.189	.153	-.270*	.602**	.445**	.306**	.095	-.079	.127	.443**	.490**	1
	Sig. (2-tailed)	.037	.092	.003	.000	.000	.001	.300	.386	.162	.000	.000	
	N	122	122	122	117	122	117	122	122	122	122	122	122

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

* . Correlation is significant at the 0.05 level (2-tailed).

RS=relationship satisfaction, PS=partner support, AT=attachment, HRQOL=health-related quality of life, PF=physical functioning, RP=role limitations due to physical health, RE=role limitations due to emotional problems, EN=energy/fatigue, EW=emotional well-being, SF=social functioning, PA=pain, GH=general health

Relationship satisfaction was significantly positively correlated with physical functioning, role limitations due to physical health, social functioning, pain, and general health. Partner support was significantly positively correlated with pain. Attachment anxiety/avoidance was significantly inversely correlated with physical functioning, role limitations due to physical health, role limitations due to emotional problems, social functioning, pain, and general health. Finally, for the criterion variable, one would expect HRQOL to be strongly correlated with the eight subscales it is comprised of. In fact for survivors of TBI, HRQOL is significantly correlated with seven of the subscales on the SF-36 but it is not significantly correlated with the energy subscale. As previously identified in the research literature (Declerg et al., 2007; Semmer et al., 2008), partner support is comprised of emotional support and instrumental support. These components of partner support were assessed for their correlations between the predictor variables and the criterion variable. The results are presented in Table 6.

Table 6. *Correlations between Emotional and Instrumental Support and Major Variables*

	AT	HRQOL	PS	RS	PS-ES	PS-IS
AT	1					
Pearson Correlation		-.474**	-.292**	-.519**	-.262**	-.278**
Sig. (2-tailed)		.000	.001	.000	.004	.002
N	122	117	122	122	122	122
HRQOL		1				
Pearson Correlation	-.474**		.219*	.369**	.244**	.140
Sig. (2-tailed)	.000		.018	.000	.008	.133
N	117	117	117	117	117	117
PS			1			
Pearson Correlation	-.292**	.219*		.502**	.885**	.869**
Sig. (2-tailed)	.001	.018		.000	.000	.000
N	122	117	122	122	122	122
RS				1		
Pearson Correlation	-.519**	.369**	.502**		.483**	.402**
Sig. (2-tailed)	.000	.000	.000		.000	.000
N	122	117	122	122	122	122
PS-ES					1	
Pearson Correlation	-.262**	.244**	.885**	.483**		.564**
Sig. (2-tailed)	.004	.008	.000	.000		.000
N	122	117	122	122	122	122
PS-IS						1
Pearson Correlation	-.278**	.140	.869**	.402**	.564**	
Sig. (2-tailed)	.002	.133	.000	.000	.000	
N	122	117	122	122	122	122

**significant at .01; *significant at .05; AT=attachment, HRQOL=health-related quality of life, PS=partner support, RS=relationship satisfaction, PS-ES=partner emotional support, PS-IS=partner instrumental support

Emotional support was significantly positively correlated with attachment, HRQOL, and relationship satisfaction. Instrumental support was significantly positively correlated with attachment and relationship satisfaction but not HRQOL. To better understand this non-significance, correlations were run between instrumental support, emotional support, and the eight domains of HRQOL. The results are presented in Table 7.

Table 7. *Correlations between Emotional and Instrumental Support and Domains of HRQOL*

		AT	HRQOL	PS	RS	PS-ES	PS-IS	PF	RP	RE	EN	EW	SF	PA	GH
AT	Pearson Correlation	1	-.474**	-.292**	-.519**	-.262**	-.278**	-.240**	-.328**	-.270**	-.166	-.096	-.478**	-.249**	-.270**
	Sig. (2-tailed)		.000	.001	.000	.004	.002	.008	.000	.003	.067	.295	.000	.006	.003
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
HRQOL	Pearson Correlation	-.474**	1	.219	.369**	.244**	.140	.708**	.775**	.567**	.026	.230	.741**	.722**	.602**
	Sig. (2-tailed)	.000		.018	.000	.008	.133	.000	.000	.000	.777	.013	.000	.000	.000
	N	117	117	117	117	117	117	117	117	117	117	117	117	117	117
PS	Pearson Correlation	-.292**	.219	1	.502**	.885**	.869**	.092	.181	.096	.104	.042	.143	.269**	.153
	Sig. (2-tailed)	.001	.018		.000	.000	.000	.316	.051	.293	.256	.647	.116	.003	.092
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
RS	Pearson Correlation	-.519**	.369**	.502**	1	.483**	.402**	.251**	.405**	.163	-.011	.059	.221**	.271**	.189
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.005	.000	.073	.906	.515	.015	.003	.037
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
PS-ES	Pearson Correlation	-.262**	.244**	.885**	.483**	1	.564**	.158	.206	.070	.043	.062	.198	.284**	.159
	Sig. (2-tailed)	.004	.008	.000	.000		.000	.083	.026	.447	.639	.495	.029	.002	.081
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
PS-IS	Pearson Correlation	-.278**	.140	.869**	.402**	.564**	1	-.005	.114	.088	.170	.018	.058	.191	.120
	Sig. (2-tailed)	.002	.133	.000	.000	.000		.953	.221	.334	.062	.840	.528	.035	.188
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
PF	Pearson Correlation	-.240**	.708**	.092	.251**	.158	-.005	1	.504**	.073	-.098	.047	.505**	.611**	.445**
	Sig. (2-tailed)	.008	.000	.316	.005	.083	.953		.000	.422	.283	.604	.000	.000	.000
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
RP	Pearson Correlation	-.328**	.775**	.181	.405**	.206	.114	.504**	1	.406**	-.027	.114	.397**	.458**	.306**
	Sig. (2-tailed)	.000	.000	.051	.000	.026	.221	.000		.000	.772	.220	.000	.000	.001
	N	117	117	117	117	117	117	117	117	117	117	117	117	117	117
RE	Pearson Correlation	-.270**	.567**	.096	.163	.070	.088	.073	.406**	1	.136	.195	.293**	.084	.095
	Sig. (2-tailed)	.003	.000	.293	.073	.447	.334	.422	.000		.136	.031	.001	.359	.300
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
EN	Pearson Correlation	-.166	.026	.104	-.011	.043	.170	-.098	-.027	.136	1	.065	-.023	-.069	-.079
	Sig. (2-tailed)	.067	.777	.256	.906	.639	.062	.283	.772	.136		.480	.804	.448	.386
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
EW	Pearson Correlation	-.096	.230	.042	.059	.062	.018	.047	.114	.195	.065	1	.118	.098	.127
	Sig. (2-tailed)	.295	.013	.647	.515	.495	.840	.604	.220	.031	.480		.194	.283	.162
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
SF	Pearson Correlation	-.478**	.741**	.143	.221**	.198	.058	.505**	.397**	.293**	-.023	.118	1	.574**	.443**
	Sig. (2-tailed)	.000	.000	.116	.015	.029	.528	.000	.000	.001	.804	.194		.000	.000
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
PA	Pearson Correlation	-.249**	.722**	.269**	.271**	.284**	.191**	.611**	.458**	.084	-.069	.098	.574**	1	.490**
	Sig. (2-tailed)	.006	.000	.003	.003	.002	.035	.000	.000	.359	.448	.283	.000		.000
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122
GH	Pearson Correlation	-.270**	.602**	.153	.189	.159	.120	.445**	.306**	.095	-.079	.127	.443**	.490**	1
	Sig. (2-tailed)	.003	.000	.092	.037	.081	.188	.000	.001	.300	.386	.162	.000	.000	
	N	122	117	122	122	122	122	122	117	122	122	122	122	122	122

**significant at .01; *significant at .05; AT=attachment, HRQOL=health-related quality of life, PS=partner support, RS=relationship satisfaction, PS-ES=emotional support, PS-IS=instrumental support, PF=physical functioning, RP=role limitations due to physical health, RE=role limitations due to emotional problems, EN=energy/fatigue, EW=emotional well-being, SF=social functioning, PA=pain, GH=general health

The analysis revealed that emotional support was significantly positively correlated with role limitations due to physical health, social functioning, and pain. Instrumental support was significantly positively correlated with pain. To better understand the relationships between the predictor variables and the criterion variable, the present study examined correlations between certain demographic variables and the main variables. Age, gender, length of time in the present romantic relationship, length of time since injury, loss of consciousness (LOC), and post-traumatic amnesia (PTA) were all examined for potential relationships with the main variables. The results of the analysis are presented in Table 8.

Table 8. *Demographic Variables and Major Variables Correlations*

		Age	Gender	TIPR	TSI	LOC	PTA	AS	HRQOL	PS	RS
Age	Pearson Correlation	1	-.280**	.642**	.302**	.241**	.242**	.111	-.241**	-.135	-.211*
	Sig. (2-tailed)		.002	.000	.001	.008	.008	.222	.009	.140	.020
	N	122	120	118	120	121	120	122	117	122	122
Gender	Pearson Correlation	-.280**	1	-.175	-.027	-.109	-.122	.114	-.026	.014	.038
	Sig. (2-tailed)	.002		.060	.770	.234	.187	.215	.782	.878	.678
	N	120	120	117	119	120	119	120	115	120	120
TIPR	Pearson Correlation	.642**	-.175	1	.176	.133	.252**	.075	-.267**	-.037	-.139
	Sig. (2-tailed)	.000	.060		.058	.152	.006	.421	.004	.695	.132
	N	118	117	118	117	118	117	118	114	118	118
TSI	Pearson Correlation	.302**	-.027	.176	1	.361**	.069	-.065	.112	-.070	.014
	Sig. (2-tailed)	.001	.770	.058		.000	.455	.483	.233	.449	.876
	N	120	119	117	120	120	119	120	115	120	120
LOC	Pearson Correlation	.241**	-.109	.133	.361**	1	.429**	.147	-.269**	.170	-.090
	Sig. (2-tailed)	.008	.234	.152	.000		.000	.107	.003	.062	.326
	N	121	120	118	120	121	120	121	116	121	121
PTA	Pearson Correlation	.242**	-.122	.252**	.069	.429**	1	.141	-.422**	.043	-.182*
	Sig. (2-tailed)	.008	.187	.006	.455	.000		.125	.000	.644	.047
	N	120	119	117	119	120	120	120	115	120	120
AS	Pearson Correlation	.111	.114	.075	-.065	.147	.141	1	-.474**	-.292**	-.519**
	Sig. (2-tailed)	.222	.215	.421	.483	.107	.125		.000	.001	.000
	N	122	120	118	120	121	120	122	117	122	122
HRQOL	Pearson Correlation	-.241**	-.026	-.267**	.112	-.269**	-.422**	-.474**	1	.219*	.369**
	Sig. (2-tailed)	.009	.782	.004	.233	.003	.000	.000		.018	.000
	N	117	115	114	115	116	115	117	117	117	117
PS	Pearson Correlation	-.135	.014	-.037	-.070	.170	.043	-.292**	.219*	1	.502**
	Sig. (2-tailed)	.140	.878	.695	.449	.062	.644	.001	.018		.000
	N	122	120	118	120	121	120	122	117	122	122
RS	Pearson Correlation	-.211*	.038	-.139	.014	-.090	-.182*	-.519**	.369**	.502**	1
	Sig. (2-tailed)	.020	.678	.132	.876	.326	.047	.000	.000	.000	
	N	122	120	118	120	121	120	122	117	122	122

** significant at .01 level; * significant at .05 level; TIPR=time in present relationship, TSI=time since injury, LOC=loss of consciousness, PTA=post-traumatic amnesia, AS=attachment security, HRQOL=health-related quality of life, PS=partner support, RS=relationship satisfaction

There were significant negative correlations between age and HRQOL and age and relationship satisfaction. There were no significant correlations between gender or length of time since injury and the main variables. Length of time in current relationship was significantly negatively correlated with HRQOL, meaning that longer time in the present relationship was correlated with lower HRQOL. LOC was significantly negatively correlated with HRQOL. PTA was significantly negatively correlated with HRQOL and relationship satisfaction. The meaning of these correlations is explored in the discussion section.

Main Analyses and Hypotheses Testing

My first hypothesis was that higher levels of predictor variables: attachment, partner support, and relationship satisfaction positively correlate with the criterion variable of HRQOL and would account for a significant amount of variance in health-related quality of life both together and individually. To test this hypothesis, a multiple regression analysis was conducted using SPSS (Version 22). Results of the regression analysis are provided in Table 9.

Table 9. *Regression Analysis Results*

Model Summary				
Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Std. Error of the Estimate
1	.499 ^a	.249	.229	109.303
a. Predictors: (Constant), Attachment, partner support, relationship satisfaction				
a. Dependent variable: Health-related quality of life				

As seen in the table above, *R* is the value of the multiple correlation coefficient between the predictors and the outcome (.499). *R*² represents how much variability in the outcome is accounted for by the predictors (25%). Additionally, the results of the regression analysis indicate that the current model generalizes well to the general population as the adjusted *R*² value (.229) is similar to the *R*² value (.249). By examining the difference between the *R* square value and the adjusted *R* square value (.249-.229=.020), it can be determined that if the model were

based upon the general population rather than the current sample it would account for approximately 0.02% less variance in the outcome.

The results of the multiple regression indicated that partner support, attachment, and relationship satisfaction were together significant predictors of HRQOL for survivors of TBI ($p=.000$). The results of the multiple regression analysis can be seen in Table 10.

Table 10. *Multiple Regression Analysis*

Model	Coefficients				
	Unstandardized		Standardized		
	B	Std. Error	Beta	t	Sig.
Partner Support	.177	2.099	.008	.084	.933
Attachment	-1.319	.322	-.385	-4.091	.000
Rel. Satisfaction	4.565	2.711	.175	1.684	.095

a. Dependent Variable: HRQOL

Next, individual contributions of the predictor variables were examined. Partner support was inputted into the regression first because it was hypothesized it would account for the greatest amount of variance. Results indicated that partner support alone did not account for a significant amount of variance in HRQOL ($p=.933$). Attachment security was theorized to account for the next greatest amount of variance and was inputted second. Attachment security was found to account for a significant amount of variance in HRQOL ($-.385, p=.000$). Relationship satisfaction was theorized to account for the least amount of variance in HRQOL and was inputted into the hierarchical regression last. It was determined that it did not account for a significant amount of variance in HRQOL ($p=.095$). Thus, hypothesis one was only partially supported. As predicted, lower levels of anxious/avoidant attachment (i.e., higher levels of attachment security) were related to higher HRQOL. However, predicted relationships

between partner support and HRQOL and between relationship satisfaction and HRQOL were not supported by this analysis.

My second hypothesis was that gender differences would be found for relationship satisfaction and HRQOL, and specifically, that female survivors of TBI would have higher levels of relationship satisfaction and HRQOL than male survivors of TBI. A one-way ANOVA was conducted with the independent variable of gender and the dependent variables of relationship satisfaction and health-related quality of life. Results indicated no significant gender differences for either relationship satisfaction or HRQOL. Thus, the second hypothesis was not supported, because no gender differences were found. The ANOVA results are reported in Table 11.

Table 11. *Gender Differences ANOVA*

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Rel. Satisfaction	Between Groups	4.066	1	4.066	.173	.678
	Within Groups	2774.493	118	23.513		
	Total	2778.559	119			
HRQOL	Between Groups	1211.490	1	1211.490	.077	.782
	Within Groups	1786870.935	113	15813.017		
	Total	1788082.425	114			

Discussion

Summary of Major Findings

Hypothesis 1. Partial support was found for the hypothesis that greater attachment security, partner support, and relationship satisfaction would be related to higher HRQOL for survivors of TBI. Specifically, present findings supported the role of greater attachment security in higher HRQOL, but did not support the role of partner support or relationship satisfaction in HRQOL. One potential explanation for this finding is that attachment security may be an especially salient factor influencing quality of life for survivors of TBI. From an attachment theory framework, the construct of attachment is comprised of the principles of the safe haven, the secure base, and proximity seeking (Hazan & Shaver, 1987). The consequences of TBI can be wide-ranging and distressing (Lezak et al., 2012). As such, TBI survivors need their romantic partners to be a safe haven and provide safety and reassurance during times of discomfort. Additionally, TBI can cause personality changes, memory problems, and confusion (Faul et al., 2010). These changes often necessitate that pre-morbid views of others, the self, and the world be reconfigured in light of the TBI. For survivors to successfully achieve this, they need their romantic partner to provide them with a secure base. Finally, proximity seeking is an important issue for survivors of TBI. TBI survivors often require assistance with activities of daily living and this task frequently falls to romantic partners (Dehle, Larsen, & Landers, 2001; Maisel, Rauer, Marshall, & Karney, 2011). As a result, it can be acutely distressing for survivors of TBI when their romantic partner is not accessible. Thus perhaps the variables of partner support and relationship satisfaction were in effect subsumed or eclipsed by overall attachment security.

Another potential explanation for the partial support of Hypothesis 1 is that there is a large amount of variability in the quality and quantity of partner support that is provided to

trauma survivors (Rini, Dunkel-Schetter, Hobel, Glynn, & Sandman, 2006). Other factors such as severity of the injury, religiosity, and neuroticism of the survivor have also been demonstrated to result in higher levels of partner support (Maisel et al., 2011). A second potential explanation for the lack of a significant relationship between partner support and HRQOL in the present study is that TBI survivors may have been reluctant to receive support from their romantic partners. In this study instrumental support was only significantly positively correlated with one of the eight domains of HRQOL, indicating that assistance with daily activities was not strongly correlated with HRQOL. One explanation for this finding is that TBI survivors may have been sensitive to excessive support from their partners. Previous research has suggested that for persons with disabilities, overprotective behaviors (e.g. paternalism) can result in rejections of offered assistance (Batavia, 2001). There is also research that has demonstrated that increased reliance on romantic partners can lead to decreased levels of quality of life for patients (Sixsmith, et al., 2007). Another explanation for the lack of a significant relationship between partner support and HRQOL is that participants in the present study may not require much instrumental support from their romantic partners. It was beyond the scope of the present study to assess participants' TBI-specific needs and limitations, but it is possible that many of them may have returned to their pre-morbid level of functioning and thus did not require instrumental support. Future research studies examining the relationship between partner support and HRQOL for TBI survivors might employ both quantitative and qualitative methodology in order to better understand this interaction.

A final potential explanation for why higher levels of partner support were not associated with higher levels of HRQOL is that the extant literature has demonstrated that increased reliance on romantic partners can lead to higher levels of caregiver strain (Razani et al., 2007).

This increase in caregiver strain could be associated with a deterioration in the level of care provided and with decreased relationship satisfaction for the caregiver. Both of these factors could potentially impact relationship satisfaction and HRQOL for the patient. Previous research has established that there is a reciprocal nature to relationship satisfaction (Galbraith, Pedro, Jaffe, & Allen, 2008). In other words, decreases in caregiver satisfaction could lead to decreases in patient relationship satisfaction and HRQOL. It was beyond the scope of the current study to assess for caregiver strain but it is possible that this variable may have obscured the interactions between relationship satisfaction, partner support, and HRQOL. Future research is needed to evaluate this possibility.

Hypothesis 2. My second hypothesis was that gender differences would be found for relationship satisfaction and HRQOL. Specifically, I hypothesized that female survivors of TBI would have higher levels of relationship satisfaction and HRQOL than male survivors of TBI. The present study did not provide support for this hypothesis. This result is not entirely surprising because there have been mixed findings from previous researchers regarding the effects of gender on HRQOL for survivors of TBI. For example, one previous study determined that women had higher levels of HRQOL subsequent to TBI than did males (Vogenthaler, Smith, & Goldfader, 1989). However, another study concluded that women had lower HRQOL following TBI than did their male counterparts (Lippert-Grüner, Maegele, Haverkamp, Klug, & Wedekind, 2007). One explanation for the inconsistent findings between gender and HRQOL in these two studies is that they were conducted in different countries (e.g. Germany and the United States) and cultural differences could account for the contrasting findings.

Other studies that have examined the relationship between gender and HRQOL in TBI survivors have determined that other variables impact this interaction. One such study concluded

that female survivors of TBI were more likely to sustain additional injuries than were males, and that this propensity was related to decreased HRQOL (Steel et al., 2010). This finding was corroborated by another study which concluded that women report more physical complaints subsequent to TBI, which was correlated to decreased HRQOL (Cantor et al., 2008). Similarly, another experiment concluded that women have lower HRQOL subsequent to TBI because of female reproductive issues (Ripley et al., 2008). These researchers reported that following TBI, many women experienced amenorrhea with the median duration of amenorrhea lasting 61 days (Ripley et al., 2008). These women also experienced more painful menses, with longer PTA times being associated with longer duration of amenorrhea and more painful menses. Ripley and his colleagues (2008) reported that these changes accounted for the decrease in HRQOL for female survivors of TBI. The findings of Ripley and colleagues (2008) are aligned with another study that reported that at six and 12 months post-injury, female TBI survivors had lower HRQOL scores than did their male counterparts when other variables were controlled for (Scholten et al., 2014). Although these findings are compelling, there is still much disagreement in the extant literature about the relationship between gender and recovery from TBI. It is possible that some unanticipated variable obscured the relationship between gender and HRQOL in the present study and more research is needed to identify specific variables that could potentially moderate this interaction.

One potential moderator is mental health. Following TBI, the mental health concerns of PTSD and depression are common (Bombadier et al., 2010; Tanev, Pentel, Kredlow, & Charney, 2014). There have been mixed findings in the extant literature regarding the prevalence rates of these conditions amongst men and women. Some researchers have concluded that following a traumatic event, women are more likely to experience PTSD (Luxton, Skopp, & Maguen, 2010;

Maguen, Luxton, Skopp, & Madden, 2012). Other researchers have reported that following TBI, women are less likely to experience PTSD but are twice as likely to experience depression and report more severe symptomology (Iversen et al., 2011). It is possible that a co-occurring mental health issue (e.g. PTSD, depression) obscured the relationship between gender and relationship satisfaction in the present study.

Although it was hypothesized that female survivors of TBI would have higher levels of relationship satisfaction than male survivors, the findings of the present study did not support this hypothesis. This finding is actually aligned with a sizeable portion of the extant literature which has demonstrated that there are no gender differences in terms of relationship satisfaction. A recent study by Karantzas, Feeney, Goncalves, and McCabe (2014) collected data from 95 romantic couples in an effort to develop a theory of heterosexual relational functioning. These researchers examined interactions between attachment security, partner support, and relationship satisfaction. Like the present study, they found an association between attachment orientation and relationship satisfaction but no gender differences for relationship satisfaction. Potential limitations to the generalizability of the study by Karantzas and his colleagues (2014) are that it was conducted in Australia, had a medium sample size, and the participants did not report any significant health concerns. Despite these limitations, the results of the present study appear to corroborate the findings of the study by Karantzas and his colleagues (2014).

Another study that did not find significant gender differences for relationship satisfaction was conducted by Kurdek (2005). Kurdek utilized a sample of 526 married couples and used longitudinal data collected over a four year period. Her research concluded that there was a reciprocal, interdependent interaction between partners' marital satisfaction but that there were no gender differences for relationship satisfaction. This interdependence of relationship

satisfaction is consistent with previous research (Karney & Bradbury, 1995). In light of the high prevalence rates of caregiver strain, PTSD, SUD, and MDD, future research should examine the nature of interdependent relationship satisfaction for romantic couples impacted by TBI.

Attachment Security

In the present study, participants with greater attachment security were found to have better overall HRQOL and individuals with greater attachment security were also found to have better functioning in six of the eight specific domains within HRQOL: physical functioning, role limitations due to physical health, role limitations due to emotional problems, social functioning, pain, and general health. Findings from the present study are consistent with previous research that has linked attachment security with HRQOL (Ponizovsky & Drannikov, 2013). In their study, Ponizovsky and Drannikov (2013) utilized self-report measures to assess 67 Israeli patients who were between the ages of 18-50. A main effect was found between insecure attachment styles and HRQOL. The researchers determined that insecure attachment style accounted for 21% of the total variance in HRQOL. Although there are differences between the Ponizovsky and Drannikov study and the present study (e.g. cultural differences, no co-occurring health condition), the results of both studies elucidate the unique contribution of attachment security to HRQOL.

The relationship of lower attachment security to higher role limitations due to physical health is aligned with attachment theorists who assert that important attachment figures serve as a safe haven in times of danger and distress (Hazan & Shaver, 1987). From an attachment theory perspective, we can understand that when an individual experiences role limitations due to physical changes associated with TBI, they may receive safety and reassurance from key attachment figures in their lives or may be better able to cope if they have internalized schemas

of secure attachment from earlier supportive relationships. Similarly, within this theoretical framework, attachment security can act as a buffer when a TBI survivor is distressed by role limitations caused by the emotional changes subsequent to TBI. This helps to explain the correlation between attachment security and the role limitations due to emotional problems found in the present study.

The finding from the present study that more securely attached individuals had higher social functioning is congruent with previous literature as well. For example, Gallo, Smith, and Ruiz (2003) administered tests of attachment security, social support, and negative social interaction to 568 undergraduate students. These researchers used canonical correlation analyses to look at the relationships between these variables. Gallo and her colleagues examined men and women separately and concluded that higher levels of attachment security were associated with higher levels of social support and lower levels of negative social interactions for both men and women. This finding also lends support for the attachment theory perspective that secure attachment promotes more positive interpersonal relationship functioning and facilitates exploration of self, others, and the world (Hazan & Shaver, 1987). The finding that securely attached individuals were less likely to experience limitations due to pain and reported lower levels of pain than insecurely attached individuals supports previous research done by Eisenberger and colleagues (2011) who used fMRI technology to demonstrate the activation of certain portions of the brain in response to pain. Eisenberger and her colleagues found that the neurological response to pain was decreased when individuals were presented with a picture of their attachment figure. Similarly, the participants' reported experience of pain was decreased when they were shown a picture of their attachment figure. A final finding of the present study pertaining to attachment was that participants with greater attachment security were also more

likely to have superior health as compared to insecurely attached participants. This finding is in line with a previous study conducted by Taylor, Marshall, Mann, and Goldberg (2012). These researchers examined medically unexplained symptoms (MUS), attachment security, and attendance rates in primary care settings. They conducted a longitudinal study over the course of 16 years and reported that there was a significant association between insecure attachment and frequent attendance in primary care settings. Furthermore, the researchers theorized that the high attendance rates of these individuals was a pathological care-seeking behavior that was a result of their insecure attachment (Taylor, Marshall, Mann, & Goldberg, 2012).

Relationship Satisfaction

Relationship satisfaction was correlated with five of the eight domains of HRQOL: physical functioning, role limitations due to physical health, social functioning, pain, and general health. This finding is consistent with previous research which has demonstrated that relationship satisfaction is strongly correlated with HRQOL (Galbraith et al., 2008). In their study, Galbraith and his colleagues (2008) examined the interaction between relationship satisfaction and HRQOL by assessing both members of a romantic dyad affected by prostate cancer. The researchers found an association between HRQOL and relationship satisfaction and determined that couples' HRQOL and relationship satisfaction were linked. At the present time, there has not been a research study that has examined whether this reciprocal relationship also exists for TBI survivors and their romantic partners. Further research in this area is needed.

The correlation between relationship satisfaction and physical functioning in the present study corroborates previous research that determined there was a significant correlation between these variables (Taylor, Davis, & Zautra, 2013). In their study, Taylor and her colleagues (2013) examined 251 women living with chronic pain. Based on their responses to a measure of

relationship satisfaction, the women were divided into three groups; unpartnered, partnered in an unsatisfying relationship, partnered in a satisfying relationship. The researchers also administered a measure of physical functioning and ran analyses to examine the interaction between relationship satisfaction and physical functioning. The analyses revealed that the women with high levels of relationship satisfaction had less pain-related physical disability and more adaptive responses to pain than did unpartnered women and women with low levels of relationship satisfaction. As a result of these findings, the researchers recommended that psychotherapeutic interventions for chronic pain should include romantic partners whenever possible and should include a psychoeducation piece that emphasizes empathy and relationship-focused coping (Taylor et al., 2013). Although there are differences between the Taylor et al. study (2013) and the present study (e.g. all female study, chronic pain), the results of both studies elucidate the unique contribution of relationship satisfaction to physical functioning.

In the current study, a significant positive correlation was found between relationship satisfaction and role limitations due to physical health. This conclusion is aligned with the findings of Galbraith and colleagues (2008) who examined romantic couples impacted by cancer and found this same correlation. Galbraith and his fellow researchers (2008) collected data from both members of the romantic dyad and also found a reciprocal pattern of influence between romantic partners. Future researchers could study both members of the romantic couple to see if this same reciprocal pattern of influence existed between romantic couples impacted by TBI. Hopefully future research in this area can address this important issue.

The present study also found a positive correlation between relationship satisfaction and social functioning. This finding is in line with research conducted by Green, Wells, and Laakso (2011) that determined that relationship satisfaction was associated with social functioning.

Green and her colleagues (2011) assessed 190 Australian couples affected by prostate cancer. The researchers employed a mixed methods approach and concluded that there were interactions between relationship satisfaction, social functioning, and quality of life (Green et al., 2011). The authors also noted that there was a high level of agreement between romantic partners in both qualitative and quantitative responses. Based on these findings, Green and her colleagues (2011) made the recommendations that romantic partners of cancer patients be involved in psychotherapy and that treatment should emphasize dyadic coping. Although there are significant differences between the study conducted by Green and her colleagues (2011) and the present study, both studies concluded that there is a correlation between relationship satisfaction and social functioning. Further research is needed in this area to elucidate the specific mechanisms of relationship satisfaction that impact social functioning.

In the present study an inverse correlation between relationship satisfaction and pain was found, such that individuals who reported higher levels of relationship satisfaction also reported they experienced lower levels of pain. This finding is congruent with a previous study that determined an inverse correlation existed between these variables such that higher levels of pain were associated with decreased levels of relationship satisfaction (Waxman, Tripp, & Flamenbaum, 2008). The study conducted by Waxman and colleagues (2008) utilized a sample of individuals with chronic low back pain (CLBP). Individuals with CLBP are frequently in physical discomfort and this is similar to the experience of TBI survivors as many of them experience headaches as a result of their head injury.

A final finding of the present study pertaining to relationship satisfaction was the significant positive correlation between relationship satisfaction and general health. This finding supports the research of Didericksen, Edwards, Wetchler, and Walker (2015) who also found a

correlation between relationship satisfaction and general health. Didericksen and her colleagues (2015) assessed 101 first-time mothers who had given birth within the last year. The researchers concluded that higher levels of perceived health were associated with higher levels of relationship satisfaction, with family coping moderating the relationship between these two variables. Although there are differences between the present study and the study done by Didericksen and her colleagues (2015), it is important to note that both studies found a correlation between relationship satisfaction and general health.

Partner Support

Of the eight domains of HRQOL, pain was the only one related to partner support (when emotional and instrumental types of partner support were combined into one variable). This supports previous research that concluded that decreases in partner support led to increases in patient-reported pain (Romano, Jensen, Turner, Good, & Hops, 2000). However, in order to better understand the specific relationship between partner support and HRQOL, the components of partner support (emotional support and instrumental support) were examined separately. Emotional support was significantly correlated with three domains of HRQOL (role limitations due to physical health, social functioning, and pain). In the present study, higher partner emotional support was related to lower role limitations due to physical health. This finding is aligned with previous research that found that emotional support was significantly correlated with role limitations due to physical health (Shyu, Tang, Tsai, Liang, & Chen, 2006). These researchers assessed 126 elderly Taiwanese individuals with hip fractures in an effort to determine the impact of emotional support on functional recovery and HRQOL. Shyu and colleagues (2006) concluded that higher levels of emotional support predicted lower levels of role limitations due to physical health. Thus, the findings of the Shyu et al. (2006) study and the

present study found similar findings despite differences in geographic location and physical concern.

Another finding of the present study was that higher partner emotional support was related to higher social functioning. This finding is consistent with previous research that has demonstrated that increases in emotional support are correlated with increases in social functioning (Barr, Hodge, Leeven, Bowen, & Knox, 2012). In their study, Barr and his colleagues (2012) examined the social functioning of 35 individuals with visual impairment. These researchers theorized that visual impairment was particularly deleterious to social functioning as it can adversely affect leisure activities, it can restrict a person's ability to get to social functions, and it can increase loneliness (Barr et al., 2012). Participants completed self-report measures that assessed social functioning and they received emotional support from a trained counselor. The researchers concluded that increases in emotional support were associated with increases in social functioning (Barr et al., 2012).

A final finding of the current study pertaining to emotional support was that higher partner emotional support was related to lower perceptions of pain. This finding is congruent with a qualitative study conducted by Richardson and colleagues in which participants reported that increases in emotional support led to decreases in perceived pain (Richardson, Ong, & Sim, 2007). In their study, Richardson and her colleagues (2007) conducted serial in-depth interviews with eight individuals (four male, four female) with chronic pain. The researchers stated that their narrative approach enabled them to document the reciprocal nature of partner emotional support. Richardson and her colleagues (2007) reported that the romantic relationships were dynamic partnerships, not a caregiver-care receiver relationship. The researchers stated that couples took turns giving care to one another, allowing each partner's problems to periodically

take priority. This dynamic, reciprocal nature of emotional support is very similar to the interdependent nature of relationship satisfaction discussed in the extant literature (e.g., Kurdek, 2005). These findings lend further credibility to the present study's recommendation that romantic partners should be involved in the therapeutic process for TBI survivors.

In the present study, instrumental support was significantly correlated with one HRQOL domain (pain). The current study's finding that instrumental support was correlated with pain is congruent with a qualitative study conducted by Richardson and colleagues in which participants reported that increases in instrumental support led to decreases in perceived pain (Richardson et al., 2007). In the present study, instrumental support had one significant correlation to HRQOL whereas emotional support had three significant correlations. This finding supports previous research that asserted that emotional support was more significant than instrumental support for persons with medical conditions (Leathers, Kelley, & Richman, 1997; Talley, Molix, Schlegel, & Bettencourt, 2010).

Demographic Variables

To better understand HRQOL for persons in romantic relationships who have survived a TBI, I examined demographic variables in relation to the key variables of the study.

Age. Age was found to be negatively correlated with HRQOL and relationship satisfaction, such that older persons were likely to report less HRQOL and relationship satisfaction than younger persons. The finding that age is negatively correlated with HRQOL is consistent with previous research that has reported that as people age, HRQOL decreases. Some researchers have contended that there is a concave trajectory for HRQOL (Nilsoon, Masud Rana, Luong, Winblad, & Kabir, 2012). Others have argued that HRQOL declines sharply when the

person reaches sixty (Asakawa, Senthilselvan, Feeny, Johnson, & Rolfson, 2012), while still others asserted that HRQOL deteriorates rapidly after age seventy (Orpana et al., 2009).

The current study's finding that age is negatively correlated with relationship satisfaction has mixed support in the extant literature. There are two potential explanations for this finding. First, persons who have survived TBI frequently experience cognitive and relational difficulty (Bush, McBride, Curtiss, & Vanderploeg, 2005; Moreno, Arango Lasprille, Gan, & Mckerral, 2013). These difficulties may exacerbate other factors associated with aging. These factors may take a toll both on the survivor and on their romantic partner, decreasing relationship satisfaction. Thus, relationship satisfaction may be lower for older survivors of TBI. A second explanation for the negative correlation between age and relationship satisfaction is that younger survivors of TBI tend to recover from the injury faster than older individuals (Senathi-Raja, Ponsford, & Schönberger, 2010). As a result, these individuals may experience less TBI symptomology. With fewer symptoms, these individuals have a higher chance for optimal relational functioning and relationship satisfaction. When discussing the interaction between age and relationship satisfaction, it is also important to acknowledge a potential confound. The length of time in the present relationship may have confounded this interaction as the younger participants were most likely in shorter relationships than were older participants.

Loss of consciousness. Loss of consciousness (LOC) was also determined to be significantly negatively correlated with HRQOL. The present study found that as the length of LOC increased, the level of HRQOL decreased. This finding has mixed support in the extant literature. Some research has produced differing results and has concluded that individuals with longer LOC times actually have higher levels of HRQOL than do individuals with shorter LOC times (Brown & Vandergoot, 1998). One possible explanation for this finding is that individuals

with longer LOC times are more grateful and appreciative to be alive than are individuals with shorter LOC times. Another potential explanation is that individuals with shorter LOC times may be more aware of their deficits. These individuals may also have fewer memory problems and might therefore be more able to compare their current level of functioning with their pre-morbid level of functioning. Some have theorized that this may contribute to higher levels of MDD (Jacobsson et al., 2010).

Another study that examined the relationship between LOC and HRQOL concluded that there was not a significant correlation between the variables (Dawson, Levine, Schwartz, & Stuss, 2000). These researchers determined that other variables such as memory ability, employment, and social support predicted changes in HRQOL better than did LOC. In yet another study, the researchers determined that longer LOC times were correlated with decreased HRQOL levels (Hoge et al., 2008). The negative correlation of the Hoge (2008) study aligns with the negative correlation between LOC and HRQOL found by the present study. Hoge and his colleagues (2008) determined that longer LOC times were associated with more pronounced physical and cognitive deficits and that these deficits led to decreases in HRQOL. In conclusion, there is little agreement amongst the extant literature about the relationship between LOC and HRQOL. Further research is needed to elucidate and explain this relationship.

Post-traumatic amnesia. Post-traumatic amnesia (PTA) was determined to be significantly negatively correlated with HRQOL. The present study found that as the length of PTA increased, the level of HRQOL decreased. This finding has mixed support in the extant literature. The present study is congruent with research conducted by Ripley and colleagues (2008) that determined that longer PTA resulted in decreased HRQOL for female survivors of TBI. Other studies that have examined the relationship between PTA and HRQOL have

determined that there was not a significant correlation between the variables (Dawson et al., 2000). In the present study, PTA was also significantly negatively correlated with relationship satisfaction. This finding has mixed support in the research literature. A study by Andelic and colleagues (2009) concluded that as length of PTA increased, relationship satisfaction decreased. These findings are contrasted by another research study which determined that PTA was not related to relationship satisfaction (Kreutzer et al., 2007). Much like with LOC, there is little consensus in the extant literature when it comes to the consequences of PTA. Further research is needed to clarify the impact of PTA on TBI survivors and their romantic partners.

Time since injury. The present study found that there was not a significant correlation between time since injury and any of the main variables. This is partially supported by the extant literature, as there are mixed findings about the relationship between time since injury and recovery from TBI. Andelic and colleagues (2009) reported that survivors of mTBI experienced lower HRQOL as time progressed. These authors hypothesized that this was due to an increase in depression rates over time. These findings are in opposition to results published by Nestvold and Stavem (2009). These researchers did a longitudinal study of TBI survivors over 22 years and concluded that as time since injury progressed, the survivor experienced increases in HRQOL. The findings of Nestvold and Stavem (2009) are partially corroborated by another study which concluded that some of the domains of HRQOL improved significantly over time (Grauwmeijer et al., 2014). Grauwmeijer and his colleagues found that the physical aspects of HRQOL significantly improved over time but that the mental components remained stable. These authors also determined that mood status was a significant predictor of HRQOL and should be frequently assessed during the rehabilitation process (Grauwmeijer et al., 2014).

Time in present relationship. The current study found that length of time in the present relationship was significantly negatively correlated with HRQOL. The extant literature on the correlation between time in present relationship and HRQOL is both limited and varied. One study indicated that time in the present relationship does not correlate with HRQOL (Ponsford et al., 2014). Other researchers concluded that time in the present relationship is correlated with HRQOL, with longer relationships linked to higher levels of HRQOL (Kreutzer et al., 2007). The dissimilar results of these two previous studies make the findings of the current study all the more significant. The findings of the present study indicate that longer lengths of time in the present relationship are significantly correlated with decreased levels of HRQOL. The present study also found a negative correlation between time in present relationship and relationship satisfaction. While this correlation was non-significant, it is interesting to note. One potential explanation for these findings is that individuals who have been in a relationship longer tend to receive more support from their partners (Kreutzer et al., 2007). While this support might initially appear beneficial, it might also be problematic. This support might cause the TBI survivor to be more aware of his/her deficits and it might also cause them to fear being a burden to their partner. Both of these scenarios could lead to decreases in HRQOL and relationship satisfaction. Further research is needed to clarify this very important issue.

Implications for Theory

Few studies have applied attachment theory to understanding quality of life and romantic relationships for TBI survivors. In the present study, attachment security was a significant predictor of HRQOL. This suggests that attachment security may be a particularly salient construct to consider when understanding quality of life for TBI survivors. Kobak and Hazan (1991) stated that the primary aim of attachment was to regulate emotions. This assertion may

be especially true for survivors of TBI, as these individuals often have difficulty with emotion regulation. Irritability, impulsivity, and personality changes are frequently associated with TBI (Rao & Lykestos, 2000) and attachment theory offers a framework for conceptualizing the emotional interplay between romantic partners. Furthermore, it has been speculated that the different attachment styles are a result of attempts (successful and unsuccessful) to control and mitigate negative affect in the primary attachment relationship (Brennan & Shaver, 1995). This aspect of attachment theory also makes it well-suited to the TBI population as these individuals frequently experience depression and relational discord (Bombardier et al., 2010; Moreno et al., 2013). Additionally, it has been theorized that the main function of attachment is to regulate anxiety and anger (Sperling & Berman, 1994). This is another reason why attachment theory can be easily applied to the TBI population, as TBI survivors frequently experience anxiety and anger (McDonald, Hunt, Henry, Dimoska, & Bornhofen, 2010).

Further support for the use of attachment theory with the TBI population comes from the idea that attachment stays constant throughout the lifespan. Previous research has demonstrated that attachment style does not change even after individuals experience medical crises. Additionally, it is possible that attachment security may become even more important to romantic functioning following TBI. This is due to the unique needs of the TBI population. Because of the significant changes and volatility of symptoms subsequent to TBI, survivors need stability and reassurance from their romantic partners during times of distress. Attachment theory uses the construct of the safe haven to conceptualize this need. Another reason why attachment theory is well-suited for use with the TBI population is that it emphasizes the importance of the secure base. The secure base is a launching pad from which the individual feels safe and comfortable to explore the world (Hazan & Shaver, 1987). This concept is

especially relevant for survivors of TBI as they may have to explore, understand, and redefine their world as a result of their TBI. The final argument for adapting Attachment theory for use with the TBI population is that it places heavy emphasis on proximity-seeking and whether or not romantic partners are available when needed. This is a particularly important issue for TBI survivors, many of whom require assistance with activities of daily living and need their romantic partner to be consistently available. Additionally, it can be used to evaluate emotional availability. Due to the strain of TBI, it is common for one or both individuals to withdraw emotionally. Attachment theory provides a lens to conceptualize the accessibility of romantic partners and therefore is well-equipped for use with TBI survivors and their partners.

Implications for Counseling

The findings of the current study have several implications for mental health professionals. First, the present study demonstrated that for survivors of TBI, the variables of partner support, relationship satisfaction, and attachment security are all correlated with HRQOL. These findings suggest that counseling efficacy can be enhanced for survivors of TBI by involving the romantic partner in the therapeutic process. When the romantic partner is included in therapy, this allows for here-and-now conversations about needs, emotions, and stressors. The therapist can observe the interactional style between the partners and can help them address maladaptive patterns. Furthermore, it allows for another perspective and provides a more complex understanding of situations. Another reason why dyadic counseling is recommended is because it allows the therapist to provide psychoeducation about the course of TBI to both partners. This way both partners can receive information and ask questions as a shared experience.

In the present study, attachment security was a significant predictor of HRQOL. These findings suggest that therapy that emphasizes attachment concerns may serve to increase HRQOL for TBI survivors. Therapy can be used to address issues such as partner availability, support, and encouragement. Counseling sessions should also explore how partners respond to one another in times of need. A clinical consideration that counselors need to be mindful of is that survivors of TBI may have difficulty expressing needs to their partners. TBI survivors may have speech problems, memory problems, and/or emotion regulation problems that interfere with their ability to effectively communicate needs to their partner (Bracy & Douglas, 2005). As such, communication skills may need to be a part of the therapeutic process. The extant literature has also demonstrated that TBI survivors may have difficulty describing their emotions and/or identifying the emotions of others (Alexithymia; Williams & Wood, 2013). To address this, interventions that teach perspective-taking can be very helpful for couples impacted by TBI. Additionally, to help TBI survivors identify and express their emotions, it can be beneficial to teach the use of “I” statements (i.e. “I feel”, “I think”, “I am hurt”, etc.).

The findings of the present study demonstrated the salience of attachment security to survivors of TBI. A primary function of attachment is to ensure emotion regulation (Kobak & Hazan, 1991). Emotion regulation is frequently a difficult task for TBI survivors, and as such emotion regulation is an important issue to cover in psychotherapy. Interventions that utilize Mindfulness may help TBI survivors to successfully regulate their emotions. There is a growing body of literature that supports the use of Mindfulness with the TBI community (Bedard et al., 2013; Johansson, Bjuhr, & Ronnback, 2012). Mindfulness has been defined as “The intentional, accepting and non-judgmental focus of one’s attention on the emotions, thoughts and sensations occurring in the present moment” (Zgierska et al., 2009, p. 2). This emphasis on the present is

important for TBI survivors because many of them tend to compare their current level of functioning with their previous abilities. This negative thinking has been linked to Major Depressive Disorder (MDD; Bombadier et al., 2010). Additionally, many TBI survivors have reported high levels of anxiety pertaining to anticipated romantic difficulties (Kreutzer et al., 2007). Thus, the approach of Mindfulness with its emphasis on the acceptance of the present moment is considered to be an optimal approach for TBI survivors.

In addition to benefiting the TBI survivor, dyadic counseling may also benefit the survivor's partner. The extent literature has demonstrated that TBI has many deleterious effects on romantic partners of TBI survivors. Common consequences are role changes, depression, decreased sexual contact, financial stressors, and increased responsibilities. Couple-based therapy can serve as an opportunity for the romantic partner to express their needs, concerns, and frustrations. Additionally, psychoeducation about the symptoms and course of TBI can be included as part of the therapeutic process. Therapists often act as a translator for patients who may be confused about medical information they receive from their doctor. This scenario is especially salient for TBI survivors and their romantic partners as these individuals may have questions and may not know what to expect about the recovery from TBI. Therapists can provide helpful information about TBI symptomology and actions that can be taken to ameliorate deleterious effects. Recommendations designed to improve memory can be made and therapists can help couples address issues such as fatigue and irritability. Therapists can design presentations that teach couples stress management skills like grounding and deep breathing. New and adaptive responses can be learned through learning strategies such as scaffolding and approximations of success. Additionally, coping strategies such as journaling and timeouts can be taught. These new skills can help the couple to make meaning of their TBI-related

experiences. These new ways of responding to adversity can help couples to achieve a warmer, more intimate relationship as well as a greater sense of dyadic strength. Equity theory is another consideration for couples experiencing TBI. Equity theory was developed by Adams (1963) and it is a tool to examine relational satisfaction as it pertains to input and output variables. Equity theory is concerned with roles, balance, and perceived fairness. It attends to distribution of resources and responsibilities and provides a format for individuals to respectfully express their needs. It can help couples to understand that responsibility needs to be shared, but not always equally. Equity theory can be used to help both partners in a relationship find roles and responsibilities that they are comfortable performing and that benefit their partner.

In light of the present study's findings on the significance of partner support and attachment security, another clinical consideration is the utilization of support groups for couples impacted by TBI. By participating in a couples-based TBI support group, both individuals will learn to express their needs so that they are heard, understood, and respected by their partners. Research supports the delineation of partner support into two primary dimensions: instrumental support and emotional support (Declercq, et al., 2007). Instrumental support consists of assistance with activities of daily living such as bathing, eating, and dressing. Emotional support is comprised of advocacy and encouragement. The extant literature demonstrates a strong correlation between both types of partner support and recovery from injury (Molassiotis, et al., 2011). Partner support also has been shown to be highly negatively correlated with depression. When partners are empathic and attentive, this helps to ameliorate feelings of depression in the recipient of the partner support (Stice, et al., 2004). However, when partners are not sensitive to each other's needs this can cause feelings of worthlessness and depression (Karakus & Patton, 2011). Perceptions of instrumental and emotional support were found to be highly correlated

with life satisfaction and well-being, such that higher support was related to higher life satisfaction and well-being (Shakespeare-Finch & Obst, 2011). By participating in a couples-based TBI support group, both individuals can receive encouragement from their peers. Additionally, they can receive training on how best to express their needs to their partner and how to respond to their partner's requests for help.

The findings of the present study elucidate the importance of providing comprehensive, collaborative care. Because of the cognitive deficits frequently associated with TBI, it may be necessary to provide cognitive rehabilitation to TBI survivors. As such, counselors may need to collaborate with neuropsychologists in an effort to provide the highest quality of care. Additionally, counselors should be mindful of the conditions that often co-occur with TBI (e.g. PTSD, MDD, SUD, anger). To address these concerns, therapists may need to coordinate treatment with psychiatrists or physicians and may need to refer their clients to supplemental anger management or substance abuse classes in addition to therapy. Finally, the extant literature has demonstrated that return to employment is one of the variables that is most strongly associated with decreased levels of depression for TBI survivors (Andelic et al., 2009; Dawson et al., 2000). In light of this finding, it is highly recommended that therapists provide career counseling services to their clients. It may also be necessary to collaborate with vocational rehabilitation providers to ensure optimal care is provided to TBI survivors.

Strengths of the Study

The present study is one of the first to examine HRQOL for TBI survivors that are in a romantic relationship within the theoretical framework of Attachment theory. Instrumentation threats to internal validity were controlled by using instruments that have established reliability and validity. The instruments were presented in a counter-balanced order to control for order

effects. Maturity and mortality threats to internal validity were limited by administering the questionnaires to the participants at a single point in time. Data collection was done in an efficient manner as the test battery was relatively brief and the scales were reasonably uncomplicated. This efficiency was an asset working with TBI participants as many of these individuals have memory problems, concentration difficulties, and fatigue issues (Bush et al., 2005). The online accessibility of the test battery was another strength of the current study, as many TBI survivors have mobility/transportation concerns (Faul et al., 2010). Another strength of the current study was that it used a Facebook webpage to reach potential participants. This enabled the study to collect data from TBI survivors in different states and geographical areas. This contributed to the diversity of the sample population and helped to increase its representativeness and external validity. The present study was also grounded in theory and Attachment theory provided a useful lens for conceptualizing strengths and stressors of TBI survivors. A final strength of the present study was that it utilized a power analysis prior to data collection. The present study exceeded the number of participants recommended by the power analysis despite the fact that historically, the TBI population is difficult to access.

Limitations of the Study

As with all research, the present study has limitations. While the online administration of the study is a strength, it can also be considered a limitation because there was no way of controlling/standardizing the test-taking environment. Differences in environmental conditions could have affected participants' response styles. The present study used data that was self-reported and this is also another potential limitation. It is possible that participants may have misremembered or misreported information pertaining to their TBI. There was no corroboration of LOC, PTA, or TBI severity with medical records. The presence of other conditions (i.e.

PTSD, MDD) could have had an impact on the correlations between the variables in the study.

Another potential limitation pertains to the demographics of the study's participants.

Approximately half of the study's participants were 25 years old or younger and the vast majority of participants identified as Caucasian. These factors limit the generalizability of the study's findings. Finally, there was a moderate level of attrition in the present study as 194 individuals began the test battery and 122 completed it. This pattern is not uncommon in the TBI population, as TBI survivors often have difficulty with concentration and prolonged attention. Individuals that did not complete 90% of the test battery were not included in the final data analysis.

Directions for Future Research

More research needs to be conducted to better understand how TBI impacts romantic functioning. The results of previous research have been mixed and there is little understanding about the specific mechanisms of dyadic change caused by TBI. Additionally, there are very few longitudinal studies that have explored the romantic functioning of TBI survivors. A longitudinal design would allow us to see how romantic functioning of TBI survivors changes over time. Another important area for future research would be to examine the mediators and moderators of dyadic functioning for TBI survivors. In the present study, age, LOC, PTA, and length of time in relationship all had significant correlations with the criterion variable of HRQOL. These variables need to be explored to better understand their relationship to romantic functioning subsequent to TBI. Future research studies should also examine the efficacy of TBI support groups for romantic couples. Currently there is little research that has examined the effects of these groups on the survivor, the partner, and the romantic relationship. As previously stated, the current study utilized participants with varying levels of TBI severity. Future studies

could examine one specific type of TBI (i.e. moderate) and examine the correlations between variables for these types of participants. This would allow for greater internal validity.

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Appendix A – Extended Literature Review

Literature Review

Traumatic Brain Injury

TBI has been defined as “An alteration in brain function, or other evidence of brain pathology, caused by an external force” (Menon, Schwab, Wright, & Maas, 2010, p. 1637). Traumatic brain injury is the most frequent cause of brain damage for children and young adults (Summers et al., 2009). Over 1.7 million Americans sustain a TBI every year and TBIs are responsible for over 53,000 deaths each year in the United States alone (Faul et al., 2010). Through medical expenses, rehabilitation, and lost productivity, TBIs cost the United States approximately \$60 billion annually (Finkelstein, Corso, & Miller, 2006). The occurrence of TBI among military personnel in recent years has reached such epidemic proportions that it has been labeled the signature wound of the Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) conflicts (Snell & Halter, 2010). While protective equipment and modern medicine have saved the lives of many accident victims who have sustained head injuries, these individuals are now living with cognitive, emotional, and physical deficits as a result of their experience (Diedler, Hanson, & O’Riley, 2009). Survivors of TBI possess a unique constellation of symptoms, and science and society are still learning how best to meet the needs of this population (Jagannathan et al., 2007). It is estimated that 5.3 million Americans require assistance with activities of daily living (ADL’s) as a result of a TBI (Thurman, Alverson, Dunn, Guerrero, & Sniezek, 1999).

The consequences of TBI vary depending on injury location and severity (Arlinghaus, Shoaib, & Price, 2005). Changes in functioning following a TBI are typically grouped into three categories: cognitive, emotional, and physical (Halstead & Walter, 2010). Typical cognitive

changes are attention deficits, memory problems, and slowed processing speed (Bush, McBride, Curtiss, & Vanderploeg, 2005). Emotional changes frequently manifest as irritability, psychiatric problems (e.g., depression, anxiety), and personality changes (Rao & Lykestos, 2000). Changes in physical functioning are characterized by sensory-motor problems, sleep disturbances, headaches, fatigue, and sensitivity to light and noise (Lezak & O'Brien, 1988). Survivors of TBI may experience changes in one, two, or all three types of functioning (Lezak, Howieson, Bigler, & Tranel, 2012). The duration of changes also depends on location and severity of injury, but it is generally accepted that cognitive recovery stabilizes after 12 months (Brooks, McKinlay, Symington, Beattie, & Campsie, 1987; Kaplan, 1993; Katz, Polyak, Coughlan, Nichols, & Roche, 2009).

The common causes of TBIs include falls, vehicle accidents, and gunshot wounds (Leon-Carrion, Dominguez-Morales, Barroso, Murillo-Cabezas, 2006). The injury can be a closed head injury (CHI) or it can be a penetrating head injury (PHI). Gunshot wounds are the most common cause of PHI (Kraus & Chu, 2005). TBI is more common in urban areas than in rural areas (Gabella et al., 1997). TBIs are most frequently sustained by individuals ages 15-24 (Love et al., 2009). Lower socioeconomic status (SES), unemployment, and lower levels of education are correlated with higher incidence rates of TBI (Lezak et al., 2012). Alcohol and substance abuse have demonstrated high correlations with TBI (Parry-Jones et al., 2006). TBI can produce primary effects that occur at the time of injury and can also cause secondary or delayed injuries that may take weeks to manifest (Lezak et al., 2012). Secondary injuries such as hemorrhage, hypoxia (decreased oxygen), ischemia (decreased blood supply), and intracranial pressure (ICP) can be as detrimental or more detrimental than primary injuries (Maas et al., 2008). TBIs are generally classified by severity (e.g., mild, moderate, and severe; Lezak et al., 2012).

The Glasgow Coma Scale (GCS; Jennett & Bond, 1975) is the most frequently used measure for assessing the presence and severity of TBI (Lezak et al., 2012). The GCS has three domains: eyes, verbal, and motor. Responses to stimuli in each of the three domains are scored on a five point scale. Higher points indicate better functioning in that domain. GCS scores range from three points (coma/death) to fifteen points (fully awake). Loss of consciousness (LOC) is another way of classifying TBI. LOC is assessed and individuals are assigned a TBI severity of mild, moderate, or severe based upon the duration of LOC. Individuals with no LOC or LOC less than one hour are categorized as having mild TBI, LOC of one hour to twenty-four hours is considered moderate TBI, LOC for greater than twenty-four hours is deemed to be severe TBI (Lezak et al., 2012). A final way of categorizing TBI is by presence/duration of post-traumatic amnesia (PTA). PTA is a disoriented state where the person is unable to remember events pertaining to the TBI (Silver, McAllister, & Yudofsky, 2005). PTA can occur without LOC and it can last up to four times the length of LOC (Lezak et al., 2012). No PTA or PTA that lasts for less than one hour is considered mild TBI, PTA that lasts from one hour to twenty-four hours is deemed moderate TBI, and PTA that lasts longer than twenty-four hours is categorized as severe TBI (Silver et al., 2005).

It is estimated that mild TBI (mTBI) accounts for approximately 80% of all TBIs (Rutland-Brown, et al., 2006). This percentage is an approximation because research has shown that a large number of individuals who sustain mTBI do not receive medical attention (Dikmen, et al., 2009). This has led some researchers to conclude that any estimate of mTBI must be considered an underestimate (Bodin, Yeates, & Klamar, 2012). Generally, TBI severity is correlated with functional outcomes (Richardson, 2000). Those that sustain a severe TBI are rarely able to return to their pre-morbid level of functioning (Lezak & O'Brien). Similarly, TBI

severity is strongly correlated with QOL. Persons who sustained a severe TBI were found to have lower appraisals of QOL than were individuals who sustained a moderate or mild TBI (Destailats et al., 2009; Ponsford, 1995).

A study by Corrigan, Whiteneck, and Mellick (2004) found that 40% of patients hospitalized with a TBI experienced memory problems, anxiety, depression, and/or irritability one year after injury. Impulsivity is another problem frequently experienced by survivors of TBI (Hibbard, Uysal, Kepler, Bogdany, & Silver, 1998). TBI often causes a number of changes that significantly impact daily functioning. Depression is particularly salient in this population as a recent study concluded that 53.1% of patients hospitalized for TBI met criteria for major depressive disorder (MDD) during the first year after TBI (Bombardier et al., 2010). There is also an increased risk of suicide subsequent to TBI, as another study reported that 10% of TBI survivors reported suicidal ideation at one year post-TBI, and 15% attempted suicide by five years post-injury (Brooks, Campsie, Symington, Beattie, & McKinlay, 1986).

The extant literature has demonstrated the functional and psychiatric difficulty that is often subsequent to TBI. Commensurate with counseling psychology's emphasis on strengths, resiliency, and individual differences, the proposed study will examine a potential protective factor: partner support, which has been shown to accelerate recovery from injury.

Partner Support

Partner support is a specific type of social support that pertains to the level of perceived assistance an individual receives from his or her romantic partner. Research supports the delineation of partner support into two primary dimensions: instrumental support and emotional support (Declerq, Vanhuele, Markey, & Willemsen, 2007; Semmer, Elfering, Jacobshagen, Beehr, & Boos, 2008). Instrumental support consists of assistance with activities of daily living

such as bathing, eating, and dressing. Emotional support is comprised of advocacy and encouragement. The extant literature demonstrates a strong correlation between both types of partner support and recovery from injury (Molassiotis, Wilson, Blair, Howe, & Cavet, 2011; Scholz, Knoll, Roigas, & Gralla, 2008). Partner support also has been shown to be highly negatively correlated with depression. When partners are empathic and attentive, this helps to ameliorate feelings of depression in the recipient of the partner support (Stice, Ragan, & Randall, 2004). However, when partners are not sensitive to the needs of the individual this can cause feelings of worthlessness and depression (Karakus & Patton, 2011). Perceptions of instrumental and emotional support were found to be highly correlated with life satisfaction and well-being, such that higher support was related to higher life satisfaction and well-being. (Shakespeare-Finch & Obst, 2011).

Although no research was found that examined partner support for persons with TBI, past research has demonstrated the role of partner support in other types of illness or injury. For example, Scholz and colleagues (2008) administered perceived partner support scales and HRQOL measures to patients who had recently undergone major surgery. Scholz and colleagues compared patients that reported high levels of partner support to patients who reported low levels of partner support. The researchers determined that patients who reported high levels of partner support experienced higher HRQOL than did patients who reported low levels of partner support. These same results were found in a six month follow-up study.

A study by Eisenberger et al. (2011) further examined the significance of partner support. The researchers employed Attachment theory and neuroimaging to explore the relationship between perceptions of partner support and pain. Functional magnetic resonance imaging (fMRI) was utilized to examine areas of the brain known to be highly active during the

experience of pain (dorsal anterior cingulate cortex and the anterior insula). The researchers also used fMRI to examine the neural activity of the ventromedial prefrontal cortex (VMPFC), which is known to be more active in response to conditions that signify safety. The VMPFC correlates negatively with stress, fear, and pain responses. Participants in the study agreed to be subjected to varying levels of pain. While experiencing pain, they were shown pictures of an attachment figure, a stranger, and an inanimate object (a chair). The researchers had three hypotheses for the study. They theorized that viewing pictures of attachment figures would reduce pain ratings. This hypothesis was supported, with the effects being most pronounced during the experience of high-pain trials. A second hypothesis was that viewing partner pictures during the experience of pain would reduce pain-related neural activity. This was supported, and again the results indicated that the effects were most pronounced during the high-pain trials. Finally, Eisenberger and colleagues theorized that viewing partner pictures during the experience of pain would result in feelings of safety as indicated by increased neural activity in the VMPFC. The findings supported this third hypothesis. The study conducted by Eisenberger et al. (2011) utilized modern medical technology to further demonstrate the significance of perceived partner support. Having outlined the significance of partner support, the present paper will now examine the interaction between TBI and HRQOL.

HRQOL

HRQOL has been defined as an individual's perception of their physical health and emotional well-being which includes health risks, social functioning, and functional status (Center for Disease Control and Prevention, 2000). Different characteristics of TBI as well as associated considerations will be presented for their relationship to HRQOL.

TBI severity. A number of studies have examined the effects of TBI severity on HRQOL. Each of the studies used the labels mild, moderate, and severe. However, two studies (Bombardier et al., 2010; Brown & Vandergoot, 1998) combined the moderate and severe group to have a “mild” group and a “severe” group. While the authors did not explain why this occurred, it is theorized that there were fewer participants in the latter group and the researchers attempted to balance the study. The results were mixed. Andelic et al. (2009) concluded that mTBI resulted in higher reported HRQOL than did severe TBI. The authors theorized that survivors of mTBI were more grateful that they were spared from serious injury and therefore they better adjusted and more content than were individuals with severe TBI. This finding was in contrast to results reported by Jacobsson et al. (2010). Jacobsson and colleagues reported mTBI produced lower HRQOL rates than did severe TBI. These authors postulated that survivors of mTBI were more cognizant of their deficits and were therefore more likely to experience lower HRQOL. The results of both of these studies are different from those found by Brown and Vandergoot (1998). These authors determined that there were not significant differences between groups. However, these authors acknowledged a limitation in that they assessed HRQOL rather infrequently. It is theorized that if they had measured more often, they might have been able to detect differences between groups.

Time since injury. Results for the impact of time since injury on HRQOL were also mixed. Andelic and colleagues (2009) reported that survivors of mTBI experienced lower HRQOL as time progressed. These authors hypothesized that this was due to an increase in depression rates over time. The researchers noted that there was a high depression rate subsequent to TBI (53.1% during the first year) and they theorized that after the individual recovered from the initial blow of their injury, they began to experience greater depression and

lower HRQOL. These findings are in opposition to results published by Nestvold and Stavem (2009). These researchers did a longitudinal study of TBI survivors over 22 years and concluded that as time since injury progressed, the survivor experienced increases in HRQOL. One possible reason for the mixed findings of these two studies is that Nestvold and Stavem (2009) measures participants over the course of 22 years while Andelic and colleagues looked at survivors for only ten years post-injury. It is possible that if Andelic et al. continued to examine participants for 12 more years, they may have found results similar to those of Nestvold and Stavem.

Depression. Bombardier and colleagues (2010) examined rates of major depressive disorder (MDD) in survivors of TBI. The authors reported prevalence rates for MDD at one month post-injury and one year post-injury. The authors determined that 20% of TBI survivors experienced MDD at some point during their first month following TBI. They also reported that 53.1% of TBI survivors experienced depression at one time during the first year post-injury. This rate is higher than previous studies and the authors theorized that they observed higher rates of MDD because they assessed for MDD more frequently than did previous researchers and therefore may have been able to be sensitive to transient episodes of MDD. The authors also reported that suicidal ideation was particularly pronounced in survivors of TBI that experienced depression. The authors reported that 10% of TBI survivors that had MDD also had co-morbid suicidal ideation. Additionally, the authors reported that individuals who experienced MDD subsequent to TBI reported lower HRQOL than did TBI survivors that did not experience MDD.

Gender differences. The effects of gender on HRQOL for survivors of TBI were mixed. A study by Lippert-Gruner and colleagues (2007) reported that women had higher rates of depression and lower reported HRQOL than did male survivors of TBI. These findings are

contrasted to those of Vogenthaler, Smith, and Goldfader (1989) who concluded that women had better recovery and HRQOL subsequent to TBI than did males.

Epilepsy. Andelic and colleagues (2009) explored the relationship between TBI and epilepsy. The researchers reported that one in five survivors of severe TBI developed epilepsy as a result. The authors reported that post-traumatic epilepsy significantly decreased the individual's HRQOL. The authors reported that individuals who experienced severe TBI were more likely to experience post-traumatic epilepsy than were individuals who experienced mild or moderate TBI. Additionally, Andelic et al. (2009) reported that individuals who developed post-traumatic epilepsy were less likely to be employed, and were more likely to have co-morbid anxiety and depression than were survivors of TBI that did not develop post-traumatic epilepsy.

Employment. Results were mixed for the effects of employment on HRQOL. Andelic and colleagues (2009) concluded that employment increased HRQOL for survivors of TBI regardless of severity. They theorized that employment was one of the ways that individuals stayed connected to the community and increased the survivor's feelings of self-efficacy. In contrast to this study, Tomberg et al. (2007) found no differences between groups for survivors of TBI that were employed versus those that were unemployed. Additionally, Tomberg and colleagues reported that employment deteriorated with time. They theorized that this was due to the increase of depression over time.

The present paper has explored the impact TBI can have on psychological well-being and HRQOL. The interaction between TBI and relationship satisfaction will now be examined.

Relationship Satisfaction

Partner stressors. Role changes are some of the most commonly experienced effects for partners of TBI survivors (Gan & Schuller, 2002). Partners often have additional responsibilities

thrust upon them such as financial provider, caretaker, and provider of transportation. With these new roles can come confusion, sadness, anger, and resentment (Kreutzer, Marwitz, Hsu, Williams, & Riddick, 2007). These emotions can lead to caregiver strain (Gosling & Oddy, 1999). In a qualitative piece to a study conducted by Kreutzer et al. (2007) several partners of TBI survivors reported that they felt like they “lost” their spouse. Others in this same study stated that they felt like they were no longer a spouse to the survivor but that they were more like a parent to them (Kreutzer et al., 2007). With this role change can come other consequences. Gosling and Oddy (1999) reported that TBI had a pronounced effect on couples’ sexual relations. These researchers reported that decreased sexual frequency, decreased sexual enjoyment, and erectile dysfunction (ED) were common consequences in male survivors of TBI. Gosling and Oddy (1999) further reported how these consequences affected the spouses of the survivor. The authors reported that wives of TBI survivors often felt neglected, sad, and sexually undesirable as a result of their partner’s sexual changes subsequent to TBI.

Patient stressors. As already stated, TBI can have a number of cognitive, emotional, and physical consequences for survivors. These consequences will now be examined in the context of a romantic relationship. Oftentimes, TBI can be co-morbid with post-traumatic stress disorder (PTSD). As a result, these symptoms often impact romantic functioning. Individuals who have survived TBI can be avoidant of their partner, can have difficulty sleeping, and can re-experience the traumatic event (Lezak et al., 2012). All of these can have a significant impact on a relationship. Additionally, personality changes can accompany TBI. Sometimes individuals can become more impulsive and/or more hostile. Emotional lability is a frequent consequence of TBI (Faul et al., 2010). Some survivors may even become paranoid and suspect their partner of infidelity (Kreutzer et al., 2007). Other associated problems for survivors of TBI are feelings of

guilt and resentment towards the caretaker (Gosling & Oddy, 1999). Couples may also fight over differences in parenting styles as a result of TBI (Landau & Hissett, 2008). Another common point of contention amongst couples is the financial strain that frequently results from TBI (Gan & Schuller, 2002). Due to this constellation of symptoms, major depressive disorder (MDD) is high in survivors of TBI. Bombardier and colleagues (2010) reported that 53% of TBI survivors experienced MDD at some point during the first year after injury. These authors also reported that TBI survivors were at an increased risk for suicide. These consequences can place a very heavy burden on romantic relationships. Having presented the adverse effects of TBI for survivors of TBI and their partners, the present paper will now examine the divorce and separation rates for these couples.

Divorce and separation rates. Some researchers have concluded that TBI can lead to a dramatic increase in marital breakdown. Some studies have reported divorce rates as high as 50-80% for couples affected by TBI (Andelic et al., 2009; Tomberg et al., 2007). These results certainly are alarming. And while it is undeniable that TBI can add strain to a romantic relationship, a closer examination of these studies reveals a number of potential limitations. First of all, a number of studies that have found high divorce rates for TBI couples have utilized small sample sizes. This affects the generalizability of results. Second, many of these studies have only included participants that had experienced severe TBI. This is actually a small part of the TBI community as it is estimated that up to 80% of TBIs are mTBI (Faul et al., 2010). Third, a number of these studies have been conducted in foreign countries and the applicability of findings to an American population is unknown. Bearing these limitations in mind, encouraging findings were reported by Kreutzer and colleagues in 2007 when their study concluded that

couples affected by TBI did not have higher marital breakdown rates than the general public. This study will be examined more closely for a discussion of reported risk and protective factors.

Risk factors. Kreutzer and colleagues (2007) identified a number of risk factors that correlated with marital breakdown. They reported length of consciousness subsequent to TBI was related to increased rates of divorce and separation. The authors concluded that couples that experienced a LOC for greater than three days were at an increased risk for divorce. Additionally, the researchers reported that when the cause of TBI was violent (gunshot wound, assault, car accident) there was a correlation with increased divorce rates. The authors did not speculate why violence correlated with higher divorce rates but it is possible that individuals that suffered violence that led to TBI might be at an increased risk for PTSD. The co-morbidity of TBI symptoms and PTSD may lead to greater marital discord.

Protective factors. Kreutzer et al. (2007) also concluded that there were protective factors that buffered against the experience of TBI. One of these factors was length of marriage prior to injury. The researchers concluded that couples that had been together longer pre-injury were less likely to divorce. Specifically, the authors reported that couples that had been married at least ten years pre-injury had significantly lower marital breakdown than did couples that had been married for shorter amounts of time. Age at time of injury was also reported to be a protective factor against the deleterious effects of TBI on marriage. Kreutzer et al. (2007) reported that couples that were over the age of 60 had significantly lower divorce rates subsequent to TBI than did younger couples. The authors did not speculate why this finding existed but it is possible that couples over the age of 60 may have other health concerns and TBI may just be considered part of the aging process. Similarly, commitment, fidelity, and routine of these couples may enable them to weather the difficulty associated with TBI. Having now

discussed the risk and protective factors associated with TBI, the current paper will now discuss some of the clinical implications when working with couples experiencing TBI.

Attachment Theory

Attachment theory was first presented in 1969 by John Bowlby. It originally described the interaction between infants and their caregivers. Bowlby defined attachment as affectional bonds between infant and caregiver. The theory maintained that affectional bonds were the result of the infant's need for safety, security, and proximity. Attachment theory described these needs as essential for biological survival and psychological well-being (Bowlby, 1969). Bowlby maintained that the caregiver's response style to these needs created one of three primary emotions in the infant. Bowlby theorized that this primary emotion came to represent the nature of the attachment and the relationship itself. The three types of attachment were secure, avoidant, anxious/ambivalent.

Many researchers have emphasized the similarities between the attachment styles of children and the attachment patterns of adults (Hazan & Shaver, 1987; Miessen, 1992; Pietromonaco & Barrett, 2000; Shaver & Mikulincer, 2002). Bowlby (1982) noted that the attachment drive was similarly activated in both children and adults. Situations that posed a threat and situations that pertained to the accessibility of the attachment figure both activated attachment needs in children and adults. When adults experienced separation from their spouses, their responses were very similar to those of infants who were separated from their mothers (Feeney & Kirkpatrick, 1996). A series of studies by Miesen (1992, 1993, 1998) also found similarities between attachment styles in infants and adults. In these studies Miesen examined the needs of infants and the needs of chronically ill adults. These two populations demonstrated

very similar attachment patterns. A review of romantic love as conceptualized by adult attachment theory will now be presented.

Adult attachment theory. The principles of attachment theory have been generalized to romantic relationships. Hazan and Shaver (1987) presented a model of adult attachment that built upon Bowlby's original findings. Adult attachment theory shared the same attachment patterns; secure, avoidant, anxious/ambivalent. About 60% of adults were found to be securely attached, approximately 25% of adults had an avoidant attachment style, and about 15% of adults had anxious/ambivalent attachment patterns (Hazan & Shaver, 1987). These rates were very similar to those found in infants (Campos, Barrett, Lamb, Goldsmith, Stenberg, 1983). Pietromonaco and Barrett (2000) theorized that this similarity was due to inner working models; ways of viewing self and society. These inner working models were developed in response to early caregivers and were generalized to other significant relationships.

Hazan and Shaver (1987) determined that there were four central aspects to adult attachment. The first was that the attachment needed to provide a safe haven. In times of danger or distress, the attachment needed to provide safety and reassurance. The second aspect was that the attachment needed to provide a secure base. This facilitated exploration of self, others, and the world. Hazan and Shaver (1987) determined that a third essential aspect of adult attachment was proximity seeking. This pertained to the availability of the romantic partner and the ability to feel safe in the presence of the romantic partner. The final aspect of adult attachment related to separation anxiety. Hazan and Shaver (1987) determined that absence from a romantic partner resulted in discomfort and distress. These findings were very similar to an earlier study which assessed separation anxiety in infants (Ainsworth, Blehar, Waters, & Wall, 1978).

Shaver and Mikulincer (2002) found further support for romantic love as an attachment process. Their research supported Bowlby's assertion that maintaining closeness to an attachment figure resulted in protection, support, and relief of distress. Other research provided additional evidence for the adaptation of Bowlby's infant attachment styles to adults. Hazan and Shaver (1987) identified beliefs and behaviors that accompanied each of the attachment patterns. They concluded that securely attached adults tended to view themselves, their partners, and their relationships positively. These individuals balanced intimacy and independence. Adults with an avoidant attachment style were found to be distrusting of and disinterested in romantic relationships. These individuals often suppressed their feelings and viewed themselves as self-sufficient. Adults with an anxious/ambivalent attachment style were found to be worrisome and impulsive. These individuals tended to have negative views of themselves and their partners.

Attachment theory identifies individual differences in people's mental schemas of the self and others. These schemas evolve out of experiences with close relationships (e.g. maternal figures). These experiences are most significant during times of need. Bretherton (1985) determined that these experiences were instrumental in the regulation of distress and the search for security. These schemas, or working models, organized experiences and guided social interaction and relationships (Bretherton & Munholland, 1999). Bowlby theorized that internal working models were "present and active throughout the life cycle" (Bowlby, 1980, p. 39). He argued that this system of interacting exerted influence "from the cradle to the grave" (Bowlby, 1979, p. 129).

Kobak and Hazan (1991) posited that the primary aim of adult attachment was emotion regulation. Different attachment styles are indicative of different attempts to regulate, control, and mitigate negative affect in primary attachment relationships (Brennan & Shaver, 1995).

Sperling and Berman (1994) concluded that adult attachment primarily served to regulate anxiety and anger. These researchers determined that “once a relationship is identified as an attachment relationship, with the set goal of an optimal level of proximity, attachment is activated by behaviors that convey threat and/or unavailability, or the primary ‘attachment’ emotions of anxiety and anger” (Sperling & Berman, 1994, p. 215). Scharfe and Bartholomew (1994) concluded that these adult attachment styles remained stable over time.

Accessibility. Attachment theory is based upon the principle of accessibility (Ainsworth, 1990; Bowlby, 1982). This principle holds true for both infant and adult attachment. Both styles of attachment are characterized by three primary behaviors (Ainsworth, 1990). First, stressful situations produce high levels of proximity-seeking. Second, the relationship provides security and comfort. Third, the inaccessibility of the attachment figure creates discomfort. Weiss (1991) determined that for both children and adults, the attachment was to a specific person. Substitutes did not provide the same level of comfort as did the individual’s primary attachment. Main (2000) concluded that attachment relationships differed from other types of relationships because attachment figures represented safety and security in times of distress.

Studies have shown that secure romantic attachment is positively correlated to measures of relationship quality and satisfaction (Collins & Read, 1990; Feeney & Noller, 1990). Couples who reported a secure romantic attachment had longer lasting relationships than did couples that reported an insecure attachment (Kirkpatrick & Davis, 1994). Individuals in enduring, committed romantic relationships have longer, healthier, and happier lives than unmarried individuals (Ryff, Singer, Wing, & Love, 2001). These researchers determined that this effect could not be attributed to overall social interaction. Ryff et al. (2001) concluded that individuals’ most intimate relationships appeared to promote health and well-being above and

beyond generalized social support. Similarly, Ross (1995) concluded that an enduring, emotionally intimate affectional bond led to higher levels of life satisfaction.

Caregiving. Caregiving has been defined as “The willingness to accept (rather than turn away) the dependency of others and to respond in ways that either reduce their distress or enhance their safety” (Simpson & Rholes, 2000, p. 116). According to Bowlby (1969), people have an innate caregiving system. This system is designed to support and protect those who are dependent or temporarily in need. This is guided by altruism and a desire to alleviate another’s distress. However, when one’s personal security is threatened, the caregiving system becomes inhibited. People become focused on their own attachment needs and distress, and this impedes the ability to act altruistically (Mikulincer et al., 2001). This self-focus is likely to affect the caregivers’ ability to perceive their partners’ support-seeking cues and may adversely affect the provision of support.

Bowlby (1969, 1982) theorized that attachment and caregiving were two separate but closely related behavioral systems. He posited that these systems operated in a reciprocal manner. Ainsworth and her colleagues (1978) provided empirical support for this notion. Ainsworth verified the links between infants’ attachment behaviors and mothers’ sensitivity as caregivers. This same reciprocal pattern of behavior can be seen in adults in romantic relationships. Proximity-seeking and support provision, as well as distress and reassurance in adults evidence the separate but complementary natures of attachment and caregiving. As Bowlby theorized, this pattern is first exhibited in infancy and is continued throughout the lifecycle.

Kirkpatrick (1998) argued that caregiving was just as important as the attachment element in romantic love. He reported that kissing, cuddling, and hand holding took place both

in adult and in infant relationships. However, he noted that some actions like putting one's arm around a person related more to caregiving than to care receiving. Additionally, all of these behaviors clearly originate in caregivers long before they are reciprocated in infants. Therefore it would seem that caregiving is a primary force in the development of a relationship. In a similar finding, Wright, Hickey, Buckwalter, & Clipp (1995) argued that attachment and caregiving were the central issues for adults facing a chronic illness. Despite its centrality in the attachment theory framework, caregiving in romantic relationships has received little attention in the extant literature. Some have even described it as the "forgotten element" of attachment theory (Simpson & Rholes, 2000, p. 114).

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Appendix B – Recruitment Letter

Dear Student,

You are invited to participate in a dissertation study of traumatic brain injury (TBI) and partner support. If you choose to participate in this study you will be asked to respond to questions about your relationship satisfaction, health-related quality of life, partner support, attachment style, TBI, and demographic information (e.g., race/ethnicity, age, etc.). While some information may be considered sensitive, your honest response to all questions is requested. In order to participate you must be at least 18 years old and must be in a romantic relationship of at least six months' duration. Your participation in this study is expected to take 30 to 40 minutes. Participants can choose to receive research participation toward the CPSY requirement OR have a \$2 donation made The Brain Trauma Foundation. The survey will be open from 2/26/2014 to 9/31/2014.

The online survey can be found at:

https://jfe.qualtrics.com/form/SV_0NBkga2MX8K6KBn?q_sm=Facebook

By completing this survey you will help to further understanding of TBI, which will allow counselors to be better informed when working with survivors of TBI and their partners.

Sincerely,

Ryan A. Hess, M.A.

Principal Investigator

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Appendix C – Informed Consent

This study is titled *Quality of Life for Individuals with Traumatic Brain Injury: The Influence of Attachment Security and Partner Support* and is meant to increase knowledge of how attachment style and perceptions of partner support and are related to relationship satisfaction and health-related quality of life for survivors of traumatic brain injury (TBI). In order to participate you must be at least 18 years old and must be in a romantic relationship of at least six months' duration. Those who are not 18 or who are not currently in a romantic relationship of at least 6 months are not eligible to participate.

If you choose to participate in this study, you will be asked to complete an online survey honestly and completely; the survey will take about 30 minutes to complete. If you are enrolled in a BSU CPSY course you may receive partial course credit for participation in this study. If you are not enrolled in a BSU CPSY course, the researcher will make a \$2 donation to The Brain Trauma Foundation for your participation.

You will not be asked for your name or any other information that would make it possible to identify your answers as belonging to you (i.e., your participation in this study is anonymous). There is a small possibility that answering some of the questions on the survey may evoke some feelings of anxiety. If this should occur, you are encouraged to visit your university counseling center. Counseling services can be obtained from Ball State University's counseling center (765-285-1376) if you develop uncomfortable feelings during your participation in this research project. Individuals who are not affiliated with Ball State University cannot use the BSU Counseling Center. These individuals are encouraged to procure counseling services from a local provider. You will be responsible for the costs of any care that is provided. It is understood that in the unlikely event that treatment is necessary as a result of your participation in this research project that Ball State University, its agents and employees will assume whatever responsibility is required by law. For questions about your rights as a research participant, please contact the Office of Research Integrity, Ball State University, Muncie, IN 47306, (765) 285-5052, irb@bsu.edu.

Your participation in this study is completely voluntary and you are free to withdraw from the study at any time for any reason without penalty or prejudice from the investigator. Information from this project may be used in follow-up studies, so data will be kept indefinitely. Please feel free to contact the investigator with any questions you may have regarding this study.

To participate in the study, click "I agree" below. By clicking on "I agree", you are agreeing to participate in this research study and agreeing that the study has been explained to you and your questions have been answered to your satisfaction. If you have any additional questions at any time before, during, or after the study you can e-mail the researcher or his doctoral chair.

Thank you for your time and participation!

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Appendix D – Debriefing Information

Shown on the last screen after each participant has submitted responses to the survey:

The study you just participated in was designed to assess health-related quality of life (HRQOL), partner support, relationship satisfaction, and attachment style in survivors of traumatic brain injury (TBI). Past research has indicated that partner support may be related to HRQOL and relationship satisfaction. The goal of the study was to determine the relationship of attachment style and partner support to HRQOL and relationship satisfaction in survivors of TBI. If you would like to read more about this topic or this study please e-mail the primary investigator for a reference list.

TRAUMATIC BRAIN FOUNDATION

Participants who are not enrolled in a BSU CPSY course may contact the researcher by email and request he make a \$2 donation to the Traumatic Brain Foundation. Participants enrolled in a BSU CPSY course have the option of either receiving partial research credit or having a \$2 donation made to The Traumatic Brain Foundation. Participants are not required to select either form of compensation if they do not desire.

COURSE CREDIT

If you are a student in a CPSY class at Ball State University you may receive one hour of research credit for having completed the survey. Because no identifying information was collected during the survey you must e-mail rahess@bsu.edu with your name and the instructor to whom you would like sent notification of participation. If you do not e-mail the researcher you will not receive credit for any CPSY class by completing this survey.

THANK YOU FOR YOUR PARTICIPATION!

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Appendix E – Demographic Questionnaire

1. What is your age?
 - A. 25 or under
 - B. 26-40
 - C. 41-55
 - D. 56 or older
2. What is your gender?
 - A. Female
 - B. Male
3. What is your primary language?
 - A. Arabic
 - B. English
 - C. French
 - D. Italian
 - E. Spanish
 - F. Other
4. What is the highest level of education you have completed?
 - A. Grammar school
 - B. High school or equivalent
 - C. Vocational/technical school (2 year)
 - D. Some college
 - E. Bachelor's degree
 - F. Master's degree
 - G. Doctoral degree
 - H. Professional degree (MD, JD, etc.)
 - I. Other
5. How would you classify yourself?
 - A. Arab
 - B. Asian/Pacific Islander
 - C. Black
 - D. Caucasian/White
 - E. Hispanic
 - F. Indigenous or Aboriginal
 - G. Latino
 - H. Multiracial
 - I. Would rather not say
 - J. Other
6. Which of the following best describes the area you live in?
 - A. Urban
 - B. Suburban
 - C. Rural
7. What is your current relationship status?
 - A. Married
 - B. Living with romantic partner
 - C. Dating
8. How long have you been involved with your romantic partner?
 - A. Less than six months
 - B. Six months to 12 months
 - C. 1 year to 2 years
 - D. 2 years to 4 years
 - E. 4 years to 6 years
 - F. 6 years to 10 years
 - G. 10 years to 15 years
 - H. 15 years to 20 years
 - I. More than 20 years
9. What is your current household income in U.S. dollars?
 - A. Under \$10,000
 - B. \$10,000 - \$19,999
 - C. \$20,000 - \$29,999
 - D. \$30,000 - \$39,999
 - E. \$40,000 - \$49,999
 - F. \$50,000 - \$74,999
 - G. \$75,000 - \$99,999
 - H. \$100,000 - \$150,000
 - I. Over \$150,000
 - J. Would rather not say
10. How long ago did you sustain a traumatic brain injury (TBI)?
 - A. Less than 6 months ago
 - B. 6 months to 12 months ago
 - C. 1 year to 2 years ago
 - D. 2 years to 4 years ago
 - E. 4 years to 6 years
 - F. 6 years to 10 years
 - G. 10 years to 15 years
 - H. 15 years to 20 years
 - I. More than 20 years
11. When you sustained a TBI, how long did you lose consciousness for?
 - A. I did not lose consciousness
 - B. Less than one hour
 - C. One hour to 24 hours
 - D. More than 24 hours
 - E. I do not remember
12. When you sustained a TBI, how long did you experience post-traumatic amnesia (PTA) for?
 - A. I did not experience PTA
 - B. Less than one hour
 - C. One hour to 24 hours
 - D. More than 24 hours
 - E. I do not remember

Appendix F
The Experiences in Close Relationships-Revised Questionnaire (ECR-R)

Instructions: The statements below concern how you feel in emotionally intimate relationships. We are interested in how you generally experience relationships, not just what is happening in a current relationship. Respond to each statement by clicking a circle to indicate how much you agree or disagree with the statement.

The following 7-point Likert type scale is used for and listed after each item:

Strongly Agree (1) ○ ○ ○ ○ ○ ○ ○ Strongly Disagree (7)

1. I'm afraid I will lose my partner's love.
2. I often worry that my partner will not want to stay with me.
3. I often worry that my partner doesn't really love me.
4. I worry that romantic partners won't care about me as much as I care about them
5. I often wish that my partner's feelings for me were as strong as my feelings for him or her.
6. I worry a lot about my relationships.
7. When my partner is out of sight, I worry that he or she might become interested in someone else.
8. When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.
9. I rarely worry about my partner leaving me. (R)
10. My romantic partner makes me doubt myself.
11. I do not often worry about being abandoned. (R)
12. I find that my partner(s) don't want to get as close as I would like.
13. Sometimes romantic partners change their feelings about me for no apparent reason.
14. My desire to be very close sometimes scares people away.
15. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.
16. It makes me mad that I don't get the affection and support I need from my partner.
17. I worry that I won't measure up to other people.
18. My partner only seems to notice me when I'm angry.
19. I prefer not to show a partner how I feel deep down.
20. I feel comfortable sharing my private thoughts and feelings with my partner. (R)
21. I find it difficult to allow myself to depend on romantic partners.
22. I am very comfortable being close to romantic partners. (R)
23. I don't feel comfortable opening up to romantic partners.
24. I prefer not to be too close to romantic partners.
25. I get uncomfortable when a romantic partner wants to be very close.
26. I find it relatively easy to get close to my partner. (R)
27. It's not difficult for me to get close to my partner. (R)
28. I usually discuss my problems and concerns with my partner. (R)
29. It helps to turn to my romantic partner in times of need. (R)
30. I tell my partner just about everything. (R)
31. I talk things over with my partner. (R)
32. I am nervous when partners get too close to me.

- 33. I feel comfortable depending on romantic partners. (R)
- 34. I find it easy to depend on romantic partners. (R)
- 35. It's easy for me to be affectionate with my partner.
- 36. My partner really understands me and my needs. (R)

Note. (R) Indicates a reverse-scored item. Items 1-18 comprise the anxiety subscale. Lower scores on this subscale indicate higher attachment anxiety. Items 19-36 comprise the avoidance subscale. Lower scores on this subscale indicate higher attachment avoidance. Therefore, lower scores on the total scale indicate greater attachment insecurity and higher scores on the total scale indicate greater attachment security.

Appendix G – Kansas Marital Satisfaction Scale

Please answer the following questions about your romantic partner and your relationship.

Item	Extremely Dissatisfied	Very Dissatisfied	Somewhat Dissatisfied	Mixed	Somewhat Satisfied	Very Satisfied	Extremely Satisfied
How satisfied are you with your partner as a romantic companion?	1	2	3	4	5	6	7
How satisfied are you with your romantic relationship?	1	2	3	4	5	6	7
How satisfied are you with your relationship with your romantic partner?	1	2	3	4	5	6	7

Appendix H - Berlin Social Support Scale

Think about the person who is closest to you, such as your spouse/partner.
How did this person react to you during the past week?

Question	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
1. The person showed me that he/she loves and accepts me.				
2. This person comforted me when I was feeling bad.				
3. This person left me alone.				
4. This person did not show much empathy for my situation.				
5. This person criticized me.				
6. This person made me feel valued and important.				
7. This person expressed concern about my condition.				
8. This person assured me that I can rely completely on him/her.				
9. This person encouraged me not to give up.				
10. This person was there when I needed him/her.				
11. This person took care of many things for me.				
12. This person took care of things I could not manage on my own.				
13. This person helped me find something positive in my situation.				
14. This person suggested activities that might distract me.				

Appendix I

SF-36© Health Survey

Instructions for completing the questionnaire: Please answer every question. Some questions may look like others, but each one is different. Please take the time to read and answer each question carefully by filling in the bubble that best represents your response.

1. In general, would you say your health is:

- Excellent
- Very good
- Good
- Fair
- Poor

2. Compared to one year ago, how would you rate your health in general now?

- Much better now than a year ago
- Somewhat better now than a year ago
- About the same as one year ago
- Somewhat worse now than one year ago
- Much worse now than one year ago

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

- a. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.
 - Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.
- b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?
 - Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.
- c. Lifting or carrying groceries.
 - Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.
- d. Climbing several flights of stairs.
 - Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.
- e. Climbing one flight of stairs.
 - Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.
- f. Bending, kneeling or stooping.
 - Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.
- g. Walking more than one mile.
 - Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.

- h. Walking several blocks.
- Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.

- i. Walking one block.
- Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.

- j. Bathing or dressing yourself.
- Yes, limited a lot.
 - Yes, limited a little.
 - No, not limited at all.

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

- a. Cut down the amount of time you spent on work or other activities?
 Yes No
- b. Accomplished less than you would like?
 Yes No
- c. Were limited in the kind of work or other activities
 Yes No
- d. Had difficulty performing the work or other activities (for example, it took extra time)
 Yes No

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

- a. Cut down the amount of time you spent on work or other activities?
 Yes No
- b. Accomplished less than you would like
 Yes No
- c. Didn't do work or other activities as carefully as usual
 Yes No

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

- Not at all
- Slightly
- Moderately
- Quite a bit
- Extremely

7. How much bodily pain have you had during the past 4 weeks?

- Not at all
- Slightly
- Moderately
- Quite a bit
- Extremely

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

- Not at all
- Slightly
- Moderately
- Quite a bit
- Extremely

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks.

a. did you feel full of pep?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

b. have you been a very nervous person?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

c. have you felt so down in the dumps nothing could cheer you up?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

d. have you felt calm and peaceful?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

e. did you have a lot of energy?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

f. have you felt downhearted and blue?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

g. did you feel worn out?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

h. have you been a happy person?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

i. did you feel tired?

- All of the time
- Most of the time
- A good bit of the time
- Some of the time
- A little of the time
- None of the time

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

- All of the time
- Most of the time
- Some of the time
- A little of the time
- None of the time

11. How TRUE or FALSE is each of the following statements for you?

a. I seem to get sick a little easier than other people

- Definitely true
- Mostly true
- Don't know
- Mostly false
- Definitely false

b. I am as healthy as anybody I know

- Definitely true
- Mostly true
- Don't know
- Mostly false
- Definitely false

c. I expect my health to get worse

- Definitely true
- Mostly true
- Don't know
- Mostly false
- Definitely false

d. My health is excellent

- Definitely true
- Mostly true
- Don't know

- Mostly false
- Definitely false