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Addressing Posttraumatic Stress Among Iraq and Afghanistan Veterans and Their Significant Others: An Intervention Utilizing Sport and Recreation

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An Intervention Utilizing Sport and Recreation

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Master of Science

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ABSTRACT

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The purpose of the study was to provide evidence-based outcomes related to a couples adaptive sports event intended to facilitate posttraumatic growth, increase marital satisfaction, leisure satisfaction, feelings of competence in sports, and reduce symptoms of posttraumatic stress disorder (PTSD) for veterans with PTSD and their significant others. The sample consisted of three groups of couples, experimental Group A had five couples, experimental Group B had six couples, and the Control Group had six couples. ANCOVA analysis indicated significant differences between Group A and the Control Group for overall PTSD and the subscale of hyperarousal. There were also significant increases in marital satisfaction, leisure satisfaction, significant decreases in the symptoms of posttraumatic stress overall, and in all three subscales: re-experiencing, avoidance/emotional numbing, and hyperarousal. Findings supported Kleiber's, Hutchinson's, and Williams' (2002) four functions of leisure in transcending negative life events. Findings indicated participation in a couple's adaptive sports program has positive impacts on the veteran's and their significant other's marital satisfaction and reduces symptoms of PTSD. It is recommended that recreation providers facilitate couple adaptive sports programs for veterans and their significant others to reduce symptoms of PTSD and increase marital satisfaction.

Keywords: couple leisure, marital satisfaction, PTG, PTSD, veteran, significant other.

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Abstract

The purpose of the study was to provide evidence-based outcomes related to a couples adaptive sports event intended to facilitate posttraumatic growth, increase marital satisfaction, leisure satisfaction, feelings of competence in sports, and reduce symptoms of posttraumatic stress disorder (PTSD) for veterans with PTSD and their significant others. The sample consisted of three groups of couples, experimental Group A had five couples, experimental Group B had six couples, and the Control Group had six couples. ANCOVA analysis indicated significant differences between Group A and the Control Group for overall PTSD and the subscale of hyperarousal. There were also significant increases in marital satisfaction, leisure satisfaction, significant decreases in the symptoms of posttraumatic stress overall, and in all three subscales: re-experiencing, avoidance/emotional numbing, and hyperarousal. Findings supported Kleiber's, Hutchinson's, and Williams' (2002) four functions of leisure in transcending negative life events. Findings indicated participation in a couple's adaptive sports program has positive impacts on the veteran's and their significant other's marital satisfaction and reduces symptoms of PTSD. It is recommended that recreation providers facilitate couple adaptive sports programs for veterans and their significant others to reduce symptoms of PTSD and increase marital satisfaction.

Keywords: couple leisure, marital satisfaction, PTG, PTSD, veteran, significant other.

Addressing Posttraumatic Stress among Iraq and Afghanistan Veterans and Significant Others: An Intervention Utilizing Sport and Recreation

Since October 2001, approximately 1.6 million men and women have been deployed for Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) (Tanielian & Jaycox, 2008). The war in Iraq and Afghanistan is said to be one of the most damaging wars psychiatrically and physically (Aronson, 2005; Warden, 2006). The Research and Development (RAND) Center for Military Health Policy Research recently found that 18.5% of returning service members from OIF/OEF meet the criteria for posttraumatic stress disorder (PTSD) or depression (approximately 300,000 veterans) and only slightly more than half of those have sought and received "minimally adequate treatment" (Tanielian & Jaycox, p. 108). Also, survival from traumatic brain injuries (TBI) and other serious physical injuries are more predominant in this war because of enhanced body armor, improved medical care, and evacuation procedures (Friedman, 2006; Gawande, 2004; Warden). It has also been found that being wounded in war has a positive relationship with experiencing symptoms of PTSD (Hoge et al., 2004; Klein, Caspi, & Gil, 2003; Kulka et al., 1990).

Veterans with PTSD in previous wars had lower family functioning and more conflict in their relationships than veterans without PTSD (Evans, McHugh, Hopwood, & Watt, 2003; Friedman, 2006; Jordan et al., 1992). Veterans with PTSD were also less expressive, less cohesive, more violent, and twice as likely to have been divorced than veterans without PTSD (Carroll, Rueger, Foy, & Donahoe, 1985; Jordan et al.; Kulka et al., 1990; Solomon, Mikulincer, Fried, & Wosner, 1987). In 2005, *USA Today* reported divorces for OIF/OEF enlisted personnel increased 28% from 2003 and 53% from 2000 (Zoroya, 2005). This implies the need for services in reestablishing healthy family and marital relationships among veterans returning from combat.

In spite of the evidence that veterans with PTSD experience negative outcomes, researchers have started to find compelling support for positive life changes resulting from their traumatic combat experience. This positive change is known as posttraumatic growth (PTG) (Dekel, 2007; Jennings, Aldwin, Levenson, Spiro III, & Mroczek, 2006; Maguen, Vogt, King, King, & Litz, 2006; Solomon & Dekel, 2007). Tedeschi, Park, and Calhoun (1998) stated, "posttraumatic growth is the antithesis of posttraumatic stress disorder, emphasizing that growth outcomes are reported even in the aftermath of the most traumatic circumstances, and even though distress coexists with this growth" (pp. 3). No studies have looked at recreation and PTG after a traumatic military experience.

The question arose, what could help veterans with the symptoms of PTSD adjust to the changes in their lives and in their families? Scholars have consistently reported a positive relationship between couple leisure involvement and aspects of family strength such as marital satisfaction, family adaptability and cohesion, and better family functioning (Hawks, 1991; Holman & Epperson, 1989; Orthner & Mancini, 1991; Zabriskie, 2001). Couchman (1988) suggested that the single most important force in developing cohesive, healthy relationships between parents and their children, and between husbands and wives, was joint leisure involvement (as cited in Canadian Parks/Recreation Association, 1997). Kleiber, Hutchinson, and Williams (2002) explained how leisure had four functions to transcending negative life events. Participation in a couple leisure event could provide help to returning soldiers suffering from symptoms of PTSD. Serving veterans is also a growing trend in parks and recreation services (National Recreation and Park Association, 2008), but little research is being done on the effectiveness or outcomes of the services being offered. Hence, the purpose of this study was to provide evidence-based outcomes related to a couple adaptive sport and recreation event

intended to facilitate posttraumatic growth, increase marital satisfaction, increase leisure satisfaction, increase feelings of competence in sports, and reduce symptoms of PTSD for veterans with PTSD and their significant others.

Review of Literature

Researchers have just begun to examine the effects of OIF/OEF on U.S. military personnel. They have examined areas of divorce rate, mental health, the effects of combat exposure, and TBI (Friedman, 2006; Hoge et al., 2004; Tanielian & Jaycox, 2008; Warden, 2006). During deployment in OIF/OEF about 320,000 soldiers have experienced a TBI (Tanielian & Jaycox). Klein et al. (2003) suggested that a person with a mild TBI had a greater risk of developing PTSD than someone with longer periods of unconsciousness or severe brain injuries. TBI is only one of the many injuries experienced during OIF/OEF.

In addition to TBIs, veterans are returning from OIF/OEF with physical disabilities including visual impairments, amputations, and others. Research reports amputations occur twice as often in OIF than any other war in the past century (Weisskopf, 2007) and visual impairments have significantly increased (Zoroya, 2007). The increase in TBIs and other physical disabilities were attributed to enhanced military armor, an increase in the use of explosive devices, and better medical care and evacuation procedures (Friedman, 2006; Gawande, 2004; Warden, 2006). A few studies have examined the relationship between being wounded in war and PTSD. Not surprisingly, they found the rates of PTSD were positively related to being wounded or injured during OIF/OEF and previous wars (Hoge et al., 2004; Kulka et al., 1990). Wounded/injured veterans of OIF/OEF have an increased need for interventions that can reduce symptoms of PTSD so they can function better in everyday life.

Research over the past three decades examined veterans of past U. S. military operations, mainly Vietnam veterans with PTSD, and the impact of their war experience on their intimate relationships. Veterans with PTSD were found to have considerable relationship problems including marital and family adjustment issues, less satisfaction with intimate relationships, parenting skills problems, decreased levels of self-disclosure, affection, sociability, intimacy, cohesion, and increased levels of violence and conflict (Beckham et al., 1996; Card, 1987; Carroll, Rueger, Foy, & Donahoe, 1985; Jordan et al., 1992; Lasko, Gurvits, Kuhne, Orr, & Pitman, 1994; Riggs, Byrne, Weathers, & Litz, 1998; Waysman, Milkulincer, Solomon, & Weisenberg, 1993). Veterans needed help with their relationships, especially when 18.5% of veterans who returned from OIF/OEF had symptoms of PTSD (approximately 300,000) (Tanielian & Jaycox, 2008). Posttraumatic stress disorder negatively affected veterans' relationships with their significant others and family when they returned home.

Significant others of veterans with PTSD also reported more issues compared to significant others of veterans without PTSD. They mentioned less satisfaction with their lives, more relationship distress, intimacy difficulties, psychiatric symptoms, impaired social relations, and problems in their relationships resulting in more steps toward separation (Jordan et al., 1992; Riggs et al., 1998; Waysman et al., 1993). More research is needed to examine veterans of OIF/OEF with symptoms of PTSD and relationships with their significant other.

Linley and Joseph (2004) argued that focusing only on the negative and adverse effects of trauma in research, leads to a biased understanding of posttraumatic responses. They suggested that in order to understand responses to trauma and adversity, and to be considered comprehensive, research needs to examine the potential for positive as well as negative changes.

PTG

Only recently have researchers begun to examine positive changes after adversity. Tedeschi and Calhoun (2004) referred to the positive psychological change experienced after a struggle with an exceedingly stressful life event as PTG. The struggle with trauma is a crucial element for PTG (Tedeschi & Calhoun). Individuals experience PTG in five major domains: (a) greater appreciation of life refers to individuals having radically different priorities and appreciating the smaller things in life, (b) more intimate relationships with others refers to how people use their social supports to help them not only cope with the situation but create strong and more meaningful relationships with them, (c) greater sense of personal strength is a growth in knowledge that bad things happened and the individual could now handle the situation, (d) new possibilities for one's life is when individuals identified new opportunities or a new path in life, and (e) spiritual development refers to becoming more religious or existential growth (Tedeschi & Calhoun). These five domains of PTG represent the paradox: out of loss there is gain (Tedeschi & Calhoun). Posttraumatic growth has been examined in a wide variety of populations ranging from the bereaved (Calhoun & Tedeschi, 1989-1990) to veterans and combat exposure (Fontana & Rosenheck, 1998).

PTG and traumatic combat experience. Soldiers are being exposed to stressors and traumatic events in greater magnitude and frequency in OIF/OEF (Aronson, 2005; Friedman, 2006). Although there is abundant evidence that the experience of combat had harmful psychological effects (e.g., Clipp & Elder, 1996; Hoge et al., 2004; Kulka et al., 1990; Tanielian, & Jaycox, 2008), there is evidence of positive effects as well (Aldwin, Levenson, & Spiro, 1994; Elder & Clipp, 1989; Elder, Gimbel, & Ivie, 1991; Gade, 1991; Jennings et al., 2006; Maguen et al., 2006). For example, Sledge, Boydstum, and Rabe (1980) found over 90% of American air-

force officers that were POWs in the Vietnam War viewed their changes following captivity as favorable; this included a clearer concept of priorities in life and a greater understanding of self and others. In addition, Solomon and Dekel (2007) found ex-POWs had higher levels of PTSD and PTG than the control group. Solomon, Waysman, and Neria (1999) found no correlation between PTSD measures and positive changes among the POWs. This indicated PTSD and PTG occurred in the same person concurrently and they were not mutually exclusive (Solomon & Dekel; Solomon et al.).

One major factor promoting PTG in veterans was a strong social support (Maguen et al., 2006). The OIF/OEF veterans relationships with their significant others need to be healthy for growth to happen when they return home. Tedeschi and Calhoun (2004) also explained when social supports remained stable and consistent over time they played a strong role in posttraumatic growth development. Maguen et al. believed these findings had implications for veterans with PTSD and called for studies to explore the relationship between PTSD, PTG, and strong social support. Leisure participation is one method that could provide growth from negative life events and increase marital satisfaction (Johnson, Zabriskie, & Hill, 2006; Kleiber et al., 2002).

Leisure and PTG. Leisure can be used in a variety of ways to adjust or cope with stressful situations, “some of which may even be growth-producing” (Kleiber et al., 2002, p. 219). As stated earlier, PTG brought about changes in perception of self and changed interpersonal relationships (Tedeschi & Calhoun, 2004). Posttraumatic growth was also likely to reflect a greater appreciation of the smaller things in life and to make the most of every moment. Kleiber et al. believed leisure could “be an important context for such transformative

experiences" (p. 221). Little attention has been given to the dynamics of positive reappraisal in leisure and leisure's ability to create growth.

Studies done on the relationship between leisure and stress placed leisure as a buffer between stressful situations, the propensity to give into that stress, and develop symptoms of both physical and psychological illness (see Iwasaki & Smale, 1998, for review of this literature). There is some support that leisure involvement does indeed moderate the impact of traumatic events on various symptoms to help endure and manage stress (Coleman & Iso-Ahola, 1993; Wheeler & Frank, 1988). Leisure based friendships moderate the effect of life stress on psychological health (depressive symptoms), physical health (illness-related symptoms), and these individuals are less affected by the daily disturbances that negatively affected the mental health of others (Iso-Ahola & Park, 1996; Iwasaki & Mannell, 2000).

Kleiber et al. (2002) proposed "four functions of leisure in transcending negative life events" (p. 225). These leisure functions include: (a) to distract, (b) generate optimism about the future, (c) aid in the reconstruction of a life story with a connection to the past, and (d) a vehicle for personal transformation or PTG (Kleiber et al.).

Leisure activities are used as a distraction to offer individuals, who are overwhelmed by negative emotion, a break from those emotions to refresh, regroup, better handle the problem, and increase psychological well-being (Iwasaki, 2001; Iwasaki & Mannell, 2000; Kleiber et al., 2002). Distracting an individual from negative feelings through leisure gives them temporary relief from the negative life event, thus enabling them to start distancing themselves from the losses associated with the event (Folkman & Moskowitz, 2000). Leisure is also used as a mood enhancer to increase positive moods and decrease negative moods while under stress (Bennett, Lundberg, & Smith, 2009; Iwasaki).

According to Kleiber et al. (2002), the second function of leisure is generating optimism about the future. By first creating a distraction, leisure makes room for the individual to take control and envision alternative possibilities in life (Kleiber et al.). Leisure has the power to regain hope for one's future even though their life was in grim circumstances (Lazarus, Kanner, & Folkman, 1980). Positively-toned leisure experiences generate both emotional strengthening and an opening up for cognitive revision (Kleiber et al.).

The third function of leisure is to aid in the reconstruction of a life story that is continuous with the past (Kleiber et al., 2002). Individuals can maintain interests they had prior to the injury by using adaptive technology to participate in their favorite pastimes and feel competent in something again (Deci & Ryan, 2000; Williams & Deci, 1996; Williams, Freedman, & Deci, 1998). Leisure offers a way for people to get back to normal. The main priority is to establish a connection with the individuals' identity from their past.

The fourth function of leisure is a vehicle for personal transformation or posttraumatic growth (Kleiber et al., 2002). The first three functions of leisure to transcend negative life events make it possible for personal transformation. Posttraumatic growth suggests a reconstruction of self occurred because one's life is disturbed in a significant way (Tedeschi & Calhoun, 2004). Reconstructing a future through leisure can be both pleasurable and meaningful. Assuming people are intentional beings capable of restoring their life, a traumatic experience allows a rewrite of their story rather than just fixing it (Brock & Kleiber, 1994). Transformation implies a change and leisure often played a leading role in this development (Kleiber et al.). Further studies are needed to look at leisure's ability to generate positive transformation that could assist in transcending traumatic events.

Only a few studies examined the connection between leisure and PTG. Chun and Lee (2007) found leisure contributed to PTG for people with spinal cord injury (SCI) in four ways: (a) provided opportunities to experience success and achievement, (b) built meaningful relationships, (c) made sense of traumatic experience and found meaning in everyday life, and (d) generated positive emotions. Although the Chun and Lee studies (2007, 2008) and Kleiber et al. (2002) provided empirical support for leisure as a tool to facilitate PTG, there is still a need for more research on the role of leisure in experiencing PTG.

Couple Leisure

As stated earlier, couples including veterans with PTSD and other disabilities are at a greater risk for instability, marital dissatisfaction, and divorce (Card, 1987; Carroll et al., 1985; Jordan et al., 1992; Riggs et al., 1998; Waysman et al., 1993; Zoroya, 2005). Also discussed earlier, one of the key features in predicting PTG is strong social supports, and one of the most important social supports for veterans returning home from combat is their significant other (Maguen et al., 2006). Veterans returning home from OIF/OEF need a way to strengthen social supports and reduce the negative marital side effects of PTSD.

Marital satisfaction and leisure participation has been studied extensively (Crawford, Houts, Huston, & George, 2002; Holman & Epperson, 1989; Holman & Jacquart, 1988; Johnson et al., 2006; Orthner, 1975; Orthner & Mancini, 1990). Researchers examining marital relationships found positive associations between couple leisure participation and family life and/or marital satisfaction (Holman, 1981; Holman & Jacquart; Miller, 1976; Orthner; Smith, Snyder, & Monsma, 1988; Zabriskie & McCormick, 2003).

Couples who participate in joint leisure together tend to have more satisfaction in their marriages and increased spousal understanding (Baldwin, Ellis, & Baldwin, 1999; Holman &

Jaquart, 1988; Orthner, 1975; Orthner & Mancini, 1990; 1991; Smith et al., 1988). Couple participation in enjoyable leisure contributes to developing joint interests and identities (Fincham, Beach, & Kemp-Fincham, 1997). Hill's (1988) research found when couple leisure time increased from 1.7 hours per week to 4.9 hours per week, on average; it reduced the probability of marital dissolution by half. Another benefit of joint leisure participation was enhanced couple communication (Baldwin et al.; Orthner & Mancini; Shaw, 2001). A high degree of communication happened during joint leisure activities that facilitated higher marital satisfaction (Baldwin et al.).

Researchers examined the relationship between couples spending time together, couple leisure involvement, and satisfaction with couple leisure involvement with marital satisfaction. Johnson et al. (2006) concluded marital satisfaction was not related to the increased time, satisfaction with increased time, or type of leisure involvement. Overall quality or satisfaction with couple leisure involvement was the major factor in marital satisfaction (Johnson et al.).

According to Orthner (1975), if couples experienced difficulties in their marriage they had a reduction in a desire to participate in activities together; this increased the conflict in their relationship. Increased couple leisure participation could help reduce the negative side effect of difficulties in marriage. Overall, past research acknowledges a link between positive couple leisure participation and marital satisfaction. These studies endorse couple leisure involvement for a veteran with PTSD and their significant other as a way to increase their marital satisfaction.

The park and recreation field has started to create programs for veterans returning from OIF/OEF. Hundreds of programs, nationwide, ranging from introductory recreation programs to competitive recreation programs exists for veterans and their families (National Recreation and Park Association, 2008; "Recreation & Sports," n.d.). The recreation field recognizes veteran

programs as a current need but there is little to no empirical evidence of the effectiveness or outcomes for these programs. Theoretically, recreation participation could reduce the symptoms of PTSD and increase marital satisfaction for veterans with PTSD and their significant others (Crawford et al., 2002; Holman & Epperson, 1989; Holman & Jacquart, 1988; Johnson et al., 2006; Kleiber et al., 2002; Orthner, 1975; Orthner & Mancini, 1990). Research is needed to examine the outcomes of veteran recreation programs. Sun Valley Adaptive Sports designed a program for veterans with PTSD and their significant others to participate in couple leisure.

Higher Ground. Sun Valley Adaptive Sports (SVAS) is a non-profit organization that provides people with disabilities the opportunity to participate in sports and recreation. Higher Ground is an adaptive sports program for individuals who are severely wounded in OIF/OEF and their significant others. This study examined two SVAS Higher Ground five-day therapeutic winter adaptive sports programs; the first group focused more on the recreation experience for the couples while the second group added more of a focus on improving communication skills and improving relationships through recreation.

The veterans and their significant other arrived on a Sunday. That night they had dinner with the group including the staff and all the other couples. At dinner the couples were introduced to the program, the staff, and each other. Monday, Tuesday, and Thursday started with couple stretching. They went skiing or snowboarding from mid-morning to early afternoon and had lunch at the ski area with the entire group (staff, snowsports instructors, and couples). Each evening they participated in an activity planned for the couples to do together and then the staff and couples went to dinner. Wednesday started with couple stretching. Then the men went snowmobiling and the women went snowshoeing. They came back together to have dinner as a group. One of the major difference in the program plan between the two groups occurred during

this dinner. The first group's couples were assigned to sit separately to continue emphasizing the importance of taking time to participate in individual leisure. The second group's couples sat together for dinner as a date night to emphasize improving their relationship by participating in activities together that they both enjoyed.

Each day had a specific theme and the theme was discussed several times throughout the day. The participants were informed about the theme of the day in the morning. The staff was prepared with conversation starters based on the theme. The dinner discussion questions were answered out loud by the couples and the staff. In the evening, the veterans and their significant others had journal questions to answer that were directed towards the theme. The journal questions were also focused on the challenges or needs faced specifically by the significant other or the veteran.

Sunday's theme was to improve relationships with peers and significant others and to identify expectation for the event. At the opening dinner, the participants were informed the purpose of the trip was to have a great time, meet new people, learn ways to improve relationships with significant others, learn new recreation skills, learn coping strategies for stress, and develop confidence in these skills to use when they returned home. Monday's theme was to improve stress management skills through recreation. The discussions with the participants focused on how they cope with stress, if they could use recreation as a tool to overcome the stress of the day and in life, and to notice if challenges become successes with the right attitude. Tuesday's theme was to learn or relearn recreation activities and how participation in recreation improves your life. The discussions focused on learning how to ski/snowboard, how it feels to learn something new, and how this experience would affect their future. Wednesday's theme for the first group was the need for individual leisure time. Wednesday's theme for the second group

was also the need for individual leisure time and how to improve relationships through recreation. The discussions focused on the need for taking personal time to recharge, how it was easier to talk to the significant other when both are having fun, and how this trip created an environment to connect with the significant other. Thursday's theme was to reflect on the application of what they learned and how to apply it to their lives. Discussions revolved around their goals for the future, if snowsports could help them accomplish their goals, the impact this week had on their lives, and what they learned about themselves this week.

SVAS wanted to study their Higher Ground program to see what the specific outcomes were for both the veterans and their significant others. As stated earlier, researchers have not examined the outcomes of recreation programs on veterans and their significant others. Therefore, the purpose of the study was to provide evidence-based outcomes related to a couple adaptive sport and recreation event intended to facilitate posttraumatic growth, increase marital satisfaction, increase leisure satisfaction, increase feelings of competence in sports, and reduce symptoms of PTSD for veterans with PTSD and their significant others.

Methods

Study Design

Data were collected over a four-month period from January, 2010 to April, 2010. The sample consisted of three groups of couples, two experimental and one control. Experimental Group A had five couples, experimental Group B had six couples, and the Control Group had six couples. Experimental Group A and B participated in the five-day winter adaptive sports program. Group A and B completed an online pretest questionnaire before they began participating in the program. On the last night of the program, the participants completed an online posttest questionnaire with similar questions. The Control Group also completed a pretest

and a posttest questionnaire one week apart from each other. The Control Group was recruited from potential future participants.

Sample

Group A veterans had an average age of 37, mostly married (60%), Caucasian (60%), African American (20%), Hispanic (20%), and unemployed (80%) with an average household income of $30,000-$39,999. All of Group A veterans were visually impaired and most identified themselves as having PTSD (80%) and/or a TBI (60%). Group A reported that it had been between one and three years since their disability (60%) or more than five years since their disability (40%). The Level of Support Scale indicated Group A's support needed in daily activities ranged from 1 to 4 (1 = intermittent, 2 = limited, 3 = extensive, 4 = pervasive) with a mean of 2.41 (*SD* = .787; see Table 3). The majority of Group A veterans served in the Army (80%) and averaged 15.25 years in the service. Group A significant others were Caucasian (60%), African American (20%), Hispanic (20%), worked full time (60%), and had an average age of 33.

Group B veterans had an average age of 35, mostly married (67%), and evenly split between Caucasian (33%), African American (33%), and Hispanic (33%). Half were unemployed with an average household income of $30,000-$39,999. All of Group B veterans identified themselves as having PTSD and a TBI. Group B reported that it had been between three and four years since their disability (50%) or more than five years since their disability (50%). The Level of Support Scale indicated Group B's support needed in daily activities ranged from 1 to 3 (1 = intermittent, 2 = limited, 3 = extensive, 4 = pervasive) with a mean of 1.82 (*SD* = .678; see Table 3). The majority of Group B veterans served in the Army (80%) and averaged 12.7 years in the service. Group B significant others were also split between Caucasian

(50%), African American (17%), and Hispanic (33%). Half were employed full time and had an average age of 32.

The Control Group veterans and their significant others had an average age of 41, everyone was married, and had an average household income of $40,000-$49,999. The Control Group veterans were Caucasian (67%), African American (17%), Other (17%), unemployed (83%), and identified themselves as having PTSD (67%), hearing impairment (67%), and/or a TBI (50%). Control Group reported that it had been between three and five years since their disability (67%) or more than five years since their disability (33%). The Level of Support Scale indicated the Control Group's support needed in daily activities ranged from 1 to 4 (1 = intermittent, 2 = limited, 3 = extensive, 4 = pervasive) with a mean of 1.8 (*SD* = .662; see Table 3).The majority of the Control Group served in the Army (83%) and averaged 17 years in the service. The Control Group significant others were Caucasian (50%), African American (17%), Hispanic (17%), and Other (17%). Half were employed either full time (33%) or part time (17%).

Descriptively the differences between the three groups included: the Control Group were slightly older on average, served more years in the military on average, and all were married. Group A had slightly higher scores on their Level of Support Scale but they were not significantly different from the other two groups ($F(2, 15) = 1.10$, $p = .362$; see Table 6). Complete demographics are provided on Group A, Group B, and the Control Group (see Tables 1 and 3).

Measures

The research questionnaire included six sections a) the Revised Dyadic Adjustment Scale (RDAS), used to measure marital satisfaction (Busby et al., 1995), b) Posttraumatic Stress

Disorder Checklist, Military/Civilian Version (PCL-M/C), used to measure PTSD (Weathers et al., 1993), c) Posttraumatic Growth Inventory (PTGI), used to measure the positive outcomes following traumatic events (Tedeschi & Calhoun, 1996), d) Perceived Competence Scale (PCS), used to measure the level of perceived competence in sports (Williams & Deci, 1996; Williams et al., 1998), e) Leisure Satisfaction Scale (LSS), used to measure the role of recreation in satisfying specific needs (Beard & Ragheb, 1980), and f) relevant sociodemographic questions.

Revised Dyadic Adjustment Scale (RDAS). The RDAS was used to measure the couple's level of relationship satisfaction (Busby et al., 1995). The RDAS consisted of 15 items. The RDAS generated a total score ranging from 15 to 90; higher scores signified more marital satisfaction. They were asked to rate the extent of agreement or disagreement between them and their partner for each item. Their answers were measured on a 6-point Likert-type scale ranging from one (Always Disagree) to six (Always Agree). The scores were calculated by summing all 15 items for the total score (Busby et al.). The Cronbach's alpha for the RDAS has been reported as .90 for the total scale (Busby et al.). The Cronbach's alpha in this study for all three groups was .87 for the total scale (see Table 2).

Posttraumatic Stress Disorder Checklist, Military/Civilian Version (PCL-M/C). The PCL-M/C measured PTSD as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV*; American Psychiatric Association, 1994; Weathers et al., 1993). The PCL-M/C consisted of 17 items. Respondents rated the degree they were bothered by symptoms of PTSD within the last week. The PCL-M/C generated a total score and three subscale scores: re-experiencing, avoidance/emotional numbing, and hyperarousal. The scores were calculated by summing all 17 items for the total score and then summing questions 1-5 for re-experiencing, 6-12 for avoidance/emotional numbing, and 13-17 for hyperarousal (Weathers

et al.). Their answers were measured on a 5-point Likert-type scale ranging from one (not at all) to five (extremely). The scores ranged from 17 to 85 for the total score, one to 25 for re-experiencing, one to 35 for avoidance/ emotional numbing, and one to 25 for hyperarousal. Higher scores signified more posttraumatic stress. An example of a re-experiencing item asked, "Repeated, disturbing memories, thoughts, or images of a stressful military experience from the past." An avoidance/emotional numbing example item asked, "Feeling distant or cut off from other people." Hyperarousal was measured by items such as, "Being super alert of watchful on guard." The PCL has reported a Cronbach's alpha of .97 for the total scale, .93 for re-experiencing and .92 for both avoidance/emotional numbing and hyperarousal (Weathers et al.). The Cronbach's alpha in this study for all three groups was .96 for the total scale, .93 for re-experiencing, .90 for avoidance/emotional numbing, and .93 for hyperarousal (see Table 2).

Posttraumatic Growth Inventory (PTGI). The PTGI (Tedeschi & Calhoun, 1996) measured the positive outcomes following traumatic events. The PTGI was scored on a 6-point Likert-type scale ranging from zero (no change) to five (change to a very great degree). The PTGI was scored by summing all the responses to obtain a total growth score. The PTGI total scores ranged from zero to 50; higher scores signified more growth. Respondents rated the degree of positive change in their life as a result of combat experience. This 21 item measure was reduced to 10 items due to space limitations in the overall questionnaire. Sun Valley Adaptive Sports was concerned with the overall length of the questionnaire. They did not want to overwhelm the participants with a lengthy questionnaire and wanted to minimize feelings of a clinical experience for the participants. Two items from each of the five subscales were used. The items used in this study were selected by researchers familiar with recreation services for veterans based on the questions' face validity (see Table 7). The five areas of growth measured

by the PTGI included: (a) appreciation of life, (b) relating to others, (c) new possibilities, (d) personal strength, and (e) spiritual development. The PTGI had a Cronbach's alpha of .90 (Tedeschi & Calhoun). The Cronbach's alpha in this study for all three groups was .92 (see Table 2).

Perceived Competence Scale (PCS). The PSC measured the level of perceived competence in an activity or domain (Williams & Deci, 1996; Williams et al., 1998). The PCS consisted of four items directed at feelings of sports competency (e.g., "I feel confident in my ability to participate in sports"). The PCS was scored on a 7-point Likert-type scale ranging from one (not true at all) to seven (very true). The PCS was scored by summing the responses to obtain a total score. The PCS scores ranged from four to 49; higher scores signified more perceived competence. Respondents rated how true the statements about competence in sports were for them. The PCS had a Cronbach's alpha of .80 (Williams & Deci; Williams et al.). The Cronbach's alpha in this study for all three groups was .95 (see Table 2).

Leisure Satisfaction Scale (LSS). The LSS measured the perceived role of recreational activities had on satisfying personal needs (Beard & Ragheb, 1980). The LSS in this study was reduced from 24 items to 10 items due to space limitations in the overall questionnaire. These items were also selected by researchers familiar with recreation services for veterans based on the questions' face validity (see Table 8). Two items were used from each of the five areas of personal need as identified in the scale. The five areas of personal needs included: (a) psychological, (b) educational, (c) social, (d) relaxation, and (e) physiological. The LSS was scored on a 7-point Likert-type scale ranging from one (not true at all) to seven (very true). The LSS was scored by summing the responses to obtain a total score. The LSS scores ranged from 10 to 70; higher scores signified more leisure satisfaction. Respondents rated how true the

statements about recreational activities were for them. The LSS had a Cronbach's alpha of .96 (Beard & Ragheb). The Cronbach's alpha in this study for all three groups was .96 (see Table 2).

Demographics. Sociodemographic data were included to compare the three groups on relevant characteristics. Items included family income, gender, time since disability, disabilities, age, ethnicity, needed level of support, and satisfaction with the program.

The level of support needed by the veteran with disabilities was determined by the Level of Support Scale adapted from Dyches (2000). The scale consisted of 11 items directed for adults with disabilities. The scale asked questions about the level of support needed in various areas of life (e.g., self-care, communication, leisure, social skills, mobility, etc.). The support scale had four levels of support: (a) intermittent, (b) limited, (c) extensive, and (d) pervasive. The intermittent level was determined by support provided on an as needed basis, temporary, or infrequent in a few settings. The limited level was determined by support provided on a regular basis for a short period of time, in several settings. The extensive level was support needed regularly in several settings, potentially extending over a long period of time. The pervasive level was constant support, intense in all settings, and life sustaining. The LSS was scored on a 4-point Likert-type scale ranging from one (intermittent) to four (pervasive). The Level of Support Scale was scored by averaging the scores from all 11 items. The scores ranged from 1 to 4; higher scores signified higher level of support needed. The Cronbach's alpha in this study for all three groups was .91 (see Table 2).

The satisfaction with the program was assessed by asking five questions about the program. It was scored on a 6-point Likert-type scale ranging from one (terrible) to six (excellent). The satisfaction with the program was scored by summing the responses to obtain a total score for each participant and then averaged to find a mean score for Group A and Group B

individually. Scores could range from six to 36; higher scores signified greater satisfaction with the program.

Analysis

The data were analyzed using Statistical Analysis Software (SAS). The data were examined for outliers and missing responses. Descriptive statistics were performed to examine the characteristics of the three groups. Preliminary analyses were performed before hypothesis testing. An analysis of variance (ANOVA) was run to examine the differences between the three groups for the Level of Support Scale. Analysis of covariance (ANCOVA) was run to examine the interaction and differences between the veterans and their significant others in all three groups. No significant interactions were found between the veterans and their significant others for any of the dependent variables. Indicating the veterans scores and their significant others scores showed similar patterns relative to the dependent variables. There were also no significant differences found for the mean difference scores between the veterans and their significant others on any of the dependent variables (p = .85 to .45; see Table 4). Since no interaction or differences were found between the veterans and their significant others, the rest of the analyses were run on each group made up of 10 or 12 individuals known to be couples. The ANCOVA alpha level was set at the $p < .05$ to test the hypotheses. The pretest scores were used as covariates and posttest scores were examined for differences between the three groups on the following variables: (a) RDAS total, (b) PCL total, (c) PCL subscales, (d) PTGI total, (e) PCS total, and (f) LSS total. Descriptive statistics were performed on the posttest scores to examine the characteristics of all the variables in this study for all three groups. As part of the ANCOVA, differences between the pretest scores and posttest scores were examined for all three groups on

all of the variables. Tukey's HSD post hoc tests were run to determine specific differences between groups.

Results

The Revised Dyadic Adjustment Scale posttest scores for Group A ranged from 37 to 54 (M = 45.5, SD = 6.536). Posttest scores for Group B ranged from 30 to 51 (M = 41.17, SD = 6.807). Posttest scores for the Control Group ranged from 30 to 68 (M = 45.58, SD = 12.638; see Table 3). The RDAS test results from the ANCOVA indicated there were no significant differences between the three groups for marital satisfaction ($F(2, 15) = 1.50$, $p = .254$; see Table 4). However, Group B did significantly increase their marital satisfaction from the pretest to the posttest (M = 3.93, SE = 1.30, $t(15) = 3.02$, $p = .009$), while no significant changes in marital satisfaction were found for Group A (M = .58, SE = 1.42, $t(15) = .41$, $p = .689$) or the Control Group (M = 2.41, SE = 1.30, $t(15) = 1.86$, $p = .082$; see Table 5).

The Posttraumatic Stress Disorder Checklist posttest scores for Group A ranged from 18 to 48 (M = 34.6, SD = 9.454). Posttest scores for Group B ranged from 18 to 77 (M = 41.75, SD = 19.278). Posttest scores for the Control Group ranged from 21 to 72 (M = 49.42, SD = 21.623; see Table 3). The PCL test results from the ANCOVA indicated there were significant differences between the groups ($F(2, 15) = 4.40$, $p = .031$) for symptoms of PTSD (see Table 4). The post-hoc Tukey's HSD test indicated Group A (M = -15.6, SE = 4.24) was significantly different from the Control Group (M = 1.19, SE = 3.89). Group B (M = -9.20, SE = 3.88) did not significantly differ from the Control Group or Group A. The Control Group's symptoms of PTSD increased and did not significantly change from the pretest to the posttest ($t(15) = .31$, $p = .763$). Group A ($t(15) = -3.68$, $p = .002$) and Group B ($t(15) = -2.37$, $p = .032$)

significantly decreased their symptoms of PTSD after participating in the adaptive sports program (see Table 5).

The PCL had three subscales: re-experiencing, hyperarousal, and avoidance/emotional numbing. The re-experiencing subscale posttest scores for Group A ranged from five to 14 (*M* = 9.1, *SD* = 3.446). Posttest scores for Group B ranged from five to 20 (*M* = 11.67, *SD* = 5.466). Posttest scores for the Control Group ranged from five to 22 (*M* = 14.42, *SD* = 7.28; see Table 3). The re-experiencing subscale ANCOVA was not significantly different between the groups ($F(2, 15) = 2.74$, $p = .097$; see Table 4). Group A (*M* = -4.17, *SE* = 1.54, $t(15) = -2.70$, $p = .017$) and B (*M* = -3.33, *SE* = 1.41, $t(15) = -2.36$, $p = .032$) both significantly decreased their re-experiencing symptoms by participating in the adaptive sports program while the Control Group increased and did not significantly change (*M* = 0.30, *SE* = 1.4, $t(15) = .21$, p = .834; see Table 5).

The avoidance/emotional numbing subscale posttest scores for Group A ranged from seven to 19 (*M* = 14.1, *SD* = 4.254). Posttest scores for Group B ranged from seven to 33 (*M* = 17.58, *SD* = 8.565). Posttest scores for the Control Group ranged from eight to 32 (*M* = 19.75, *SD* = 7.899; see Table 3). The avoidance/emotional numbing subscale ANCOVA was not significantly different between the groups ($F(2, 15) = 3.23$, $p = .068$; see Table 4). Group A significantly decreased their avoidance/emotional numbing symptoms (*M* = -5.58, SE = 2, $t(15) = -2.79$, $p = .014$). Group B (*M* = -2.79, *SE* = 1.84, $t(15) = -1.51$, $p = .151$) and the Control Group (*M* = 1.27, SE = 1.85, $t(15) = 2.52$, $p = .024$) did not significantly change their avoidance/emotional numbing symptoms (see Table 5).

The hyperarousal subscale posttest scores for Group A ranged from five to 17 (*M* = 11.4, *SD* = 3.836). Posttest scores for Group B ranged from five to 24 (*M* = 12.5, *SD* = 5.839). Posttest

scores for the Control Group ranged from five to 23 (M = 15.25, SD = 7.187; see Table 3). The hyperarousal subscale ANCOVA was significantly different between the groups (F(2, 15) = 4.59, p = .028; see Table 4). The post-hoc Tukey's HSD test indicated Group A (M = -5.75, SE = 1.27) was significantly different from the Control Group (M = -.54, SE = 1.14). Group B (M = -3, SE = 1.15) was not significantly different from Group A or the Control Group. Hyperarousal symptoms significantly decreased for Group A (t(15) = -4.52, p < .001) and B (t(15) = -2.61, p = .012), whereas the Control Group did not significantly change (t(15) = .48, p = .642; see Table 5).

The Posttraumatic Growth Inventory posttest scores for Group A ranged from 19 to 55 (M = 42.3, SD = 10.52). Posttest scores for Group B ranged from 12 to 60 (M = 38.83, SD = 14.721). Posttest scores for the Control Group ranged from 10 to 51 (M = 36.25, SD = 13.212; see Table 3). The PTGI test results from the ANCOVA indicated there was no significant differences between the three groups for posttraumatic growth (F(2, 15) = 0.35, p = .711; see Table 4). Also, no significant changes were found from the pretest to the posttest for Group A (M = -.37, SE = 3.76, t(15) = -.10, p = .922), Group B (M = -2.64 , SE = 3.43, t(15) = -.77, p = .453), or the Control Group (M = -4.63, SE = 3.43, t(15) = -1.35, p = .197; see Table 5).

The Perceived Competence Scale posttest scores for Group A ranged from 13 to 28 (M = 19.7, SD = 4.832). Posttest scores for Group B ranged from 6 to 28 (M = 19.83, SD = 7.107). Posttest scores for the Control Group ranged from 4 to 28 (M = 14.83, SD = 8.494; see Table 3). Similar results were found from the ANCOVA for the PCS with no significant differences between the groups (F(2, 15) = 1.05, p = .374; see Table 4) for perceived competence in sports. Also, no significant changes were found from pretest to posttest in any of the groups but the Control Group's perceived competence in sports decreased (M = -.46, SE = 2.17, t(15) = -.21,

p = .835) while perceived competence in sports increased for Group A (M = 4.07, SE = 2.34, t(15) = 1.74, p = .102) and Group B (M = 1.40, SE = 2.26, t(15) = .62, p = .544; see Table 5).

The Leisure Satisfaction Scale posttest scores for Group A ranged from 41 to 69 (M = 57.2, SD = 10.528). Posttest scores for Group B ranged from 40 to 70 (M = 59.42, SD = 9.615). Posttest scores for the Control Group ranged from 10 to 68 (M = 48.92, SD = 17.997; see Table 3). The LSS ANCOVA was not significantly different between the groups (F(2, 15) = 1.97, p = .174; see Table 4) for leisure satisfaction. Group A (M = 14.84, SE = 4.14, t(15) = 3.59, p = .003) and B (M = 11.37, SE = 3.81, t(15) = 2.99, p = .009) significantly increased their leisure satisfaction and the Control Group did not (M = 4.35, SE = 3.68, t(15) = 1.18, p = .256; see Table 5).

Scores were computed on the satisfaction with the program for Group A and B. The satisfaction with the program scores for Group A ranged from 24 to 36 (M = 32.7, SD = 3.97) and Group B ranged from 28 to 36 (M = 34.58, SD = 3.09) with a maximum score of 36 (see Table 3).

Discussion

The intent of this study was to examine the outcomes of an adaptive sports program on veterans with PTSD and their significant others' marital satisfaction, symptoms of posttraumatic stress disorder, posttraumatic growth, perceived competence in sports, and leisure satisfaction. There were three key findings from this study. First, couple leisure participation had positive impacts and reduced the negative impacts of a traumatic military experience. Second, these findings started to provide evidence for the four functions of leisure to transcend negative life events (Kleiber et al., 2002). Finally, the findings provided evidence that couple leisure participation improves marital satisfaction for veterans with PTSD and their significant others.

The first key finding was couple leisure participation reduced the negative impacts of a traumatic military experience and had positive impacts for both the veterans with PTSD and their significant others. The reductions in negative impacts were indicated by the significant decrease in the symptoms of PTSD, while the Control Group, though not significant, increased. The positive impacts were indicated by the significant increase in marital satisfaction, a significant increase in leisure satisfaction, and the trend of increased perceived competence in sports while the Control Group's perceived competence in sports decreased. Veterans with PTSD from OIF/OEF could use recreation with their significant others to reduce the symptoms of PTSD, improve their relationships, and in the long run should improve their overall quality of life. This is critical for OIF/OEF veterans and their significant others when approximately 300,000 veterans are returning with PTSD or depression, and only slightly more than half are receiving minimally adequate treatment (Tanielian & Jaycox, 2008), and PTSD impacts veterans' and their significant others' relationship in negative ways (Beckham et al., 1996; Card, 1987; Carroll et al., 1985; Jordan et al., 1992; Lasko et al., 1994; Riggs et al., 1998; Waysman et al., 1993; Zoroya, 2005). Hundreds of recreation programs around the country are being developed for OIF/OEF veterans with the purpose of helping wounded veterans heal (National Recreation and Park Association, 2008; "Recreation & Sports," n.d.). This study helps to provide empirical evidence that recreation participation improves the lives of veterans with PTSD and their significant others by reducing the symptoms of PTSD and increasing marital satisfaction. Kleiber et al. (2002) discussed how recreation participation assists on multiple levels with traumatic experiences.

The second key finding from this study was starting to provide evidence for Kleiber et al.'s (2002) four functions of leisure to transcend negative life events. The four functions are

distraction, increased optimism about the future, aide in the reconstruction of a life story, and a vehicle for personal transformation (Kleiber et al.). Distraction from negative emotions was indicated in this study by the significant decrease in the overall posttraumatic stress scale and in particular the reduction in re-experiencing symptoms. Re-experiencing symptoms includes flashbacks, traumatic day dreams, or nightmares about the traumatic experience (American Psychiatric Association, 1994). The positive experience of couple recreation participation, indicated by the high satisfaction with the program scores in this study, appears to indicate a distraction from the negative emotions associated with re-experiencing negative military events.

Veterans with PTSD and their significant others need to be distracted from their negative emotions with positive experiences together to give them the opportunity to rebuild a positive relationship. Findings from this study suggest joint participation in adaptive sports distracts veterans and their significant others from their negative emotions, allowing them to begin to rebuild a positive relationship. Rebuilding of a positive relationship was indicated by the avoidance/emotional numbing subscale's significant decrease while the overall marital satisfaction increased in this study. The distraction created by participation in the adaptive sports program may have produced the space necessary for optimism about the future to occur.

The second function, increased optimism about the future, was observed in this study by increased leisure satisfaction, increased marital satisfaction, and high satisfaction with the program, as well as decreased hyperarousal and avoidance/emotional numbing scores. Hyperarousal symptoms include hypervigilance, extreme startle response, and always being on alert. Avoidance/emotional numbing symptoms include feelings of disconnection from people, avoidance of places or people and numbing of emotions (American Psychiatric Association, 1994). The positive experience of the adaptive sports participation reduced the stress of

hyperarousal and avoidance/emotional numbing for both the veterans and their significant others and in turn made it possible for them to enjoy their recreation experience, enjoy each other more, and increase optimism about the future (Johnson et al., 2006; Kleiber et al., 2002). Findings from this study support recreation as a tool to reduce stress (Iwasaki & Smale, 1998), increase positive emotion (Bennett et al., 2009; Chun & Lee, 2007; Iwasaki, 2001), and increase marital satisfaction (Crawford et al., 2002; Holman & Epperson, 1989; Holman & Jacquart, 1988; Johnson et al., 2006; Orthner, 1975; Orthner & Mancini, 1990). The findings also support recreation as a way to improve connectedness between couples (Chun & Lee, 2007) as evidenced by the reduced feelings of avoidance/emotional numbing. Increased optimism about the future is an important function for veterans' relationship with their significant others because the divorce rates have steadily increased over the course of OIF/OEF wars (Zoroya, 2005). Kleiber et al.'s second function of leisure, increased optimism about the future, was accomplished by these veterans and their significant others by participating in the adaptive sports program.

The third function, reconstruction of life story, was determined through the Perceived Competence Scale. Individuals have a need to feel competent before they can pursue life goals (Deci & Ryan, 2000). Before soldiers leave for war they are highly trained and good at their job; when injured soldiers come home they are not able to pursue their military career in the way they had planned (Friedman, 2006). They lose their sense of self and have a need to feel competent in something again (Deci & Ryan; Friedman). Even though there was not a significant difference between the pretest and the posttest, the Control Group's average mean score decreased while Group A's and B's increased. The length of the program could help explain why competence did not significantly change. Most people may not feel completely competent in a recreation activity after only one week of lessons. If the veterans and their significant others continued to participate

in adaptive sports they could increase their competence over time and start to reconstruct their life story through recreation (Kleiber et al., 2002; Deci & Ryan; Williams & Deci, 1996; Williams, Freedman, & Deci, 1998). Leisure could provide an avenue for veterans and their significant others to experience success, achievement, and regain confidence when other aspects of their lives were not succeeding (Chun & Lee, 2007).

If the four functions are looked at as sequential, it is not surprising the fourth function of personal transformation was also not significant. The findings indicated posttraumatic growth had not occurred yet for these veterans; again this could be due to the length of the program and not having feelings of competence yet. This program was set up to be an introductory experience for winter adaptive sports to show the veterans and their significant others activities they could do together, with the intention for them to continue pursuing activities together when they return home. Posttraumatic growth is a lifelong process and not usually realized until years after a veteran's traumatic military experience. Vietnam veterans experienced PTG 20 years after the war (Jennings et al., 2006). If the veterans and their significant others in this study continue to participate in adaptive sports together they may experience PTG sooner. Findings from this study support Kleiber et al.'s four functions of leisure transcending negative life events. The other main focus of this study was marital satisfaction.

The final key finding from this study was couple leisure participation improves marital satisfaction for veterans with PTSD and their significant others. This finding was indicated by the significant increase in marital satisfaction for Group B. The main interest of this study was the impact of adaptive sports programs on veterans with PTSD and their significant others, but this study was two-fold. The other piece of the study was a program evaluation. Sun Valley Adaptive Sports modified their program between the experimental groups. The experimental

groups were different because Group A was more focused on the recreation experience for the couples while Group B added a focus on communication skills and improving relationships through recreation. The finding that Group B increased their marital satisfaction and Group A did not, supports findings from previous research. Baldwin et al. (1999) and Holman and Jacquart (1988) both examined the relationship between joint leisure participation, communication, and marital satisfaction. They came to the conclusion that communication was needed in joint leisure activities to increase marital satisfaction. Communication skills are a key component for martial satisfaction and joint leisure participation can be used as a tool to teach positive communication skills. The findings from this study could be used by recreation professionals to improve the outcomes of programs intended to enhance relationships.

Practical Implication

Findings from this study have valuable implications for veterans with PTSD and their significant others and those who work with these couples. This study provided empirical evidence that adaptive couple leisure participation reduces symptoms of PTSD, increases marital satisfaction when communication skills are focused on, and increases leisure satisfaction. These findings provide support for recreation programs to include veterans with PTSD into their programs to help them decrease the negative impacts of PTSD and increase positive outcomes from participation.

Also, this study provided empirical evidence for Kleiber et al.'s (2002) four functions of leisure to transcend negative life events. Practitioners should keep these four functions in mind when programming for veterans with PTSD. Recreation professionals could use this model to teach veterans and their significant others with PTSD the importance of recreation. This model could also give direction to program planners who want the outcome of PTG through recreation.

Furthermore, if practitioners and couples want to use recreation to transcend negative life events, longer programs are needed. This is very similar to taking medication. Most posttraumatic stress disorder medications take several weeks to take effect and have side effects (tolerance, suicide, abuse, etc.; Ravindran & Stein, 2009). Participating in recreation programs does not have the side effects these medications do. Recreation could be used to compliment medications to overcome PTSD and increase PTG.

In addition, practitioners implementing adaptive sports programs for veterans with PTSD should consider involving the significant other and focus on communication skills to have more of an impact on marital satisfaction and decrease both the veterans and their significant others symptoms of PTSD. According to this and previous studies (Baldwin et al., 1999; Holman & Jacquart, 1988), if practitioners want to improve marital satisfaction they need to focus on communication skills during joint leisure participation. This study also expanded the research examining recreation and marital satisfaction to include veterans with PTSD and their significant others (Crawford et al., 2002; Holman & Epperson, 1989; Holman & Jacquart, 1988; Johnson et al., 2006; Orthner, 1975; Orthner & Mancini, 1990). More research is still needed to examine the outcomes of recreation programs for veterans.

Limitations and Recommendations for Future Research

Overall, findings from this study indicated that participating in an adaptive sports program increased marital satisfaction, increased leisure satisfaction, and decreased symptoms of PTSD for both the veteran and their significant other. Limitations, however, must be recognized in the current study. The sample for this study was convenient and small. Results cannot be generalized beyond this sample. The small sample size made it difficult to find significant results between the groups. It was also not possible to look at the different demographics because of the

sample size to see if certain groups responded better than others. Future research should consider a larger randomized sample and control group. Future research should consider communication as an integral part of increasing marital satisfaction and examine how recreation influences communication and marital satisfaction.

This study used a p-value of .05 even though there were several dependent variable examined. The rationale behind this decision was few studies had been done on this topic so we wanted to look at several different variables to better pin point areas for future research. By dividing the significance level by the number of dependent variables, the p-value would be reduced so greatly that there would be no significant findings. Future studies should consider a lower p-value when examining similar variables found in this study. Another limitation of this study was the length restriction on the questionnaire.

We were not able to use the entire PTGI due to space limitation in the overall questionnaire by SVAS. This may have affected the results of the PTGI. Future studies should consider examining leisure participation and PTG longitudinally using the entire scale because PTG occurs over the life span (Jennings et al., 2006) and leisure may or may not increase the rate of PTG. Also, future research should consider looking at the connection between leisure participation and reduction of PTSD symptoms. These could be looked at concurrently to see the interaction between leisure participation rates, PTSD symptoms and PTG. Such research may help policy makers recognize recreation as a viable therapy for veterans with PTSD and their significant others. Future studies could also examine the subscale of avoidance/emotional numbing separately. If veterans and their significant others were using recreation to distract themselves from a negative experience this could increase the symptoms of avoidance. While emotional numbing could decrease because leisure participation increased their connectedness to

each other (Baldwin et al., 1999; Fincham et al., 1997; Hill, 1988; Holman & Jaquart, 1988; Johnson et al., 2006; Orthner, 1975; Orthner & Mancini, 1990; 1991; Smith et al., 1988).

Additionally, future research should examine different demographics than those found in this study. The participants in this sample had a moderate disability level determined by the Level of Support Scale. Future researchers need to examine veterans who are not physically disabled and those who are severely disabled to see if recreation participation impacts them differently. The veterans in this study were able bodied for the most part, and this may have an impact on the perceived competence scores. Those who are more severely disabled may have a greater increase in perceived competence because they have fewer opportunities to feel competent in physical aspects of their life. Gender should also be considered in future research. Female veterans may have different results compared to male veterans. Other demographic areas that may have different impacts on the results could be time since disability, type of disability, and age. Such research could contribute to the body of knowledge regarding veterans with PTSD and their significant others and the impact recreation has on their lives.

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Table 1

Demographics for the Sample in Each Group

	Group A	Group B	Control Group
Veteran Age*	37	35	41
SO Age*	33	32	41
Caucasian	6	5	7
African American	2	3	2
Hispanic	2	4	1
Other	0	0	2
Married	6	8	12
Single	1	3	0
Separated or Divorced	3	1	0
Full time	3	4	3
Part time	1	4	1
Unemployed	6	4	8
Income*	30-39K	30-39K	40-49K
PTSD	4	7	4
TBI	4	7	3
Amputation (arm)	1	0	0
Amputation (leg)	0	1	1
Hemiplegic	1	0	0
Epilepsy	1	0	0
Depression	0	1	0
VI	6	0	2
Hearing Loss	0	0	4
Other	0	2	4
Army	4	4	5
Air Force	1	1	1
Marines	0	1	0
Years Served*	15.3	12.7	17.0
Time Since Disability			
1-2 yrs	1	0	0
2-3 yrs	2	0	0
3-4 yrs	0	3	3
4-5 yrs	0	0	1
5+ yrs	2	3	2

Note. Counts for veterans and significant others together unless specified.
*Denotes an average score

Table 2

Cronbach Alpha for Dependent Variables in Each Group and All Groups Combined

Dependent Variable	Group A	Group B	Control Group	All Groups
	α	α	α	α
RDAS	.684	.850	.920	.866
PCL	.902	.971	.974	.960
Re-experience	.734	.941	.969	.933
Avoidance/ Emotional Numbing	.859	.933	.901	.903
Hyperarousal	.858	.936	.963	.928
PTGI	.814	.940	.932	.915
PCS	.913	.957	.956	.952
LSS	.971	.926	.955	.960
Level of Support	.892	.915	.939	.905

Table 3

Posttest Descriptive Statistics for Dependent Variables in Each Group

Dependent Variable	Group A			Group B			Control Group		
	M	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
RDAS	45.5	6.536	17	41.17	6.807	21	45.58	12.638	38
PCL	34.6	9.454	30	41.75	19.278	59	49.42	21.623	51
Re-experience	9.1	3.446	9	11.67	5.466	15	14.42	7.28	17
Avoidance/ Emotional Numbing	14.1	4.254	12	17.58	8.565	26	19.75	7.899	24
Hyperarousal	11.4	3.836	12	12.5	5.839	19	15.25	7.187	18
PTGI	42.3	10.52	36	38.83	14.721	48	36.25	13.212	41
PCS	19.7	4.832	15	19.83	7.107	22	14.83	8.494	24
LSS	57.2	10.528	28	59.42	9.615	30	48.92	17.997	58
Level of Support	2.41	.787	19	1.82	.678	21	1.8	.662	20
Satisfaction Program	32.7	3.97	12	34.58	3.088	8	NA	NA	NA

Table 4

Analysis of Covariance Summary

Dependent Variable	Differences Between all Groups[b]		Differences Between Veteran and SO[a]	
	F	*p*	F	*p*
RDAS	1.50	.25	.14	.71
PCL	4.40	.03*[t]	.04	.84
Re-experience	2.74	.10	.04	.85
Avoidance/ Emotional Numbing	3.23	.07	.08	.77
Hyperarousal	4.59	.03*[t]	.57	.46
PTGI	.35	.71	.18	.68
PCS	1.05	.37	.54	.47
LSS	1.97	.17	.27	.61

Note. [a] df = 1,15
[b] df = 2,15
[t] Tukey's test indicated Group A significantly different from Control Group.
*$p < .05$

Table 5

Average Mean Difference From Pretest to Posttest for the Dependent Variables in the Control Group, Group A, Group B, Veterans, and Significant Others

Dependent Variable	Control Group		Group A		Group B		Veteran		Significant Other	
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
RDAS	2.42	1.30	.58	1.42	3.93*	1.30	2.05	1.04	2.57*	1.04
PCL	1.19[a]	3.89	-15.60*[a]	4.24	-9.20*	3.88	-8.46*	3.64	-7.27	3.63
Re-experience	.30	1.40	-4.17*	1.54	-3.33*	1.41	-2.24	1.14	-2.55*	1.15
Avoidance/ Emotional Numbing	1.27	1.85	-5.58*	2.00	-2.79	1.84	-2.74	1.69	-1.99	1.69
Hyperarousal	-.54[a]	1.14	-5.75*[a]	1.27	-3.00*	1.15	-2.48*	1.07	-3.71*	1.06
PTGI	-4.63	3.43	-.37	3.76	-2.64	3.43	-2.21	2.20	-2.89	2.20
PCS	-.46	2.17	4.07	2.34	1.40	2.26	2.67	1.86	.67	1.84
LSS	4.35	3.68	14.84*	4.14	11.37*	3.81	11.30*	3.08	9.07*	3.05

Note. $*p < .05$ Significant difference between pretest and posttest for that particular variable in the group.

[a] Significant difference between the Control Group and Group A.

Table 6

Analysis of Variance for Support Scale

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	130.104	2	65.052	1.101	.362
Within Groups	767.833	13	59.064		
Total	897.938	15			

Table 7

Posttraumatic Growth Inventory Questions

Subscale	Question
Appreciation of Life:	I can better appreciate each day. I changed my priorities about what is important in life.
Relating to Others:	I more clearly see that I can count on people in times of trouble. I put more effort into my relationships.
New Possibilities:	I established a new path for my life. I am more likely to try to change things which need changing.
Personal Strength:	I know better that I can handle difficulties. I discovered that I'm stronger than I thought I was.
Spiritual Development:	I have a stronger religious faith. I have a better understanding of spiritual matters.

Table 8

Leisure Satisfaction Scale Questions

Subscale	Question
Psychological:	My recreational activities give me self-confidence. My recreational activities give me a sense of accomplishment.
Educational:	My recreational activities help me learn about myself. My recreational activities help me learn about other people.
Social:	I have social interaction with others through recreational activities. My recreational activities have helped me to develop close relationships with others.
Relaxation:	My recreational activities help me to relax. My recreational activities help relieve stress.
Physiological:	I do recreational activities which develop my physical fitness. My recreational activities help me to stay healthy.

Appendix A

Prospectus

Chapter 1

Aronson (2005), a reporter for Frontline, reported on a soldier's combat experience saying:

> U.S. Marine Rob Sarra had been in the military for eight years when the war in Iraq began. A sergeant in charge of a unit of 32, he was considered part of the "tip of the spear" among the first troops to reach Baghdad. In late March 2003, Sarra opened fire on an Iraqi woman in a black burqa he suspected was a suicide bomber, prompting others in his unit to begin firing as well. Her body torn apart by bullets, the woman fell quickly to the ground. It was only then that Rob saw she held a small white flag. "Right then and there I was just like, what the hell happened? I was crying, hysterical…this woman got killed by my actions," Sarra tells FRONTLINE. "I wasn't going to talk to anyone about it. But little did I know it kind of worked itself back up to the surface when I came home." Sarra is one of thousands of U.S. soldiers returning from Iraq free from physical injury but haunted by memories from the battlefield (para. 1-3).

The war in Iraq and Afghanistan is said to be one of the most damaging wars psychiatrically (Aronson). Jim Dooley, a former soldier who fought in Vietnam, and has counseled combat veterans for the last 20 years explains, "you have no protection anywhere at all times. And therefore you're in constant death threat. And you're also witnessing death at an incredibly close range" (Aronson, para. 4). These types of experiences are most likely going to create psychological problems for the soldiers. As Sarra stated above, the memories of these experiences continue even after these soldiers leave the battlefield. Dooley states that in most cases soldiers do not start struggling with their experiences until they return home (Aronson).

Colonel Thomas Burke, the director of health policy for the Department of Defense, explains, “nobody returns from combat unchanged” (Aronson, 2005 para. 9). Burke witnesses that soldiers have expectations about what their families are going to be like, and their families have expectations of what their returning soldiers are going to be like (Aronson). Burke states, “the one thing that is absolutely true about all of those expectations is all of them are going to be wrong” (Aronson, para. 9). Burke’s assumptions about returning soldiers and their families imply that families can expect challenges to their family relationships. Current literature points out veterans with symptoms of posttraumatic stress disorder (PTSD) are likely to have lower family functioning and quality of relationships (Carroll, Rueger, Foy, & Donahoe, 1985; Evans, McHugh, Hopwood, & Watt, 2003; Jordan et al., 1992; Riggs, Byrne, Weathers, & Litz, 1998; Solomon, Mikulincer, Fried, & Wosner, 1987). Since the war started in October 2001, approximately 1.6 million men and women have been deployed for Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) (Tanielian & Jaycox, 2008), many of them will be returning home and the number of soldiers with symptoms of PTSD is most likely going to increase. This implies the real possibility that more couples and families will be struggling as a positive functional unit.

These soldiers will have been exposed to multiple combat traumas (Friedman, 2006). For the most part, these troops are not going to be physically injured but many could be considered psychological casualties of OIF/OEF (Friedman). The Research and Development (RAND) Center for Military Health Policy Research recently found that 18.5% of returning service members from OIF/OEF meet the criteria for PTSD or depression (approximately 300,000 veterans) (Tanielian & Jaycox, 2008). Posttraumatic stress disorder is defined as an anxiety disorder that occurs after going through a traumatic event such as combat or military exposure

(National Center for PTSD, 2009). For the purposes of this research, the focus will be on PTSD because the symptoms are identifiable and there is serious growing concern for our returning troops with PTSD (Aronson, 2005).

With our fast paced media, the American public realizes the sacrifices that American troops and their families have made on their behalf. Therefore, there is a desire of the American public to be supportive of them. This can be seen through reports of communities, individuals, and businesses financially, emotionally, and materialistically supporting their returning veterans. With the prospect of more soldiers returning with the symptoms of PTSD and adjusting to the changes in their lives and in their families the question arises how we can help them with their adjustment.

Scholars have consistently reported a positive relationship between couple leisure involvement and aspects of family strength such as marital satisfaction, family adaptability and cohesion, and better family functioning (Hawks, 1991; Holman & Epperson, 1989; Orthner & Mancini, 1991; Zabriskie, 2001). Scholars have also suggested that the single most important force in developing cohesive, healthy relationships between parents and their children, and between husbands and wives, is joint leisure involvement (Couchman, 1988, as cited in Canadian Parks/Recreation Association, 1997). Therefore, a possible avenue to help returning soldiers suffering from symptoms of PTSD cope with their return home may be through participating in a couple leisure event. The purpose of this study is to see if positive posttraumatic growth, PTSD, and relationship adjustment for veterans with PTSD can be influenced by a couple adaptive sports and recreation event. Posttraumatic Growth (PTG), according to Tedeschi and Calhoun (2004), is a “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (p. 1).

Problem Statement

The problem of this study is to examine the effects of an adaptive sport and recreation program developed for couples, where one individual has recently returned from combat in OIF/OEF. Differences between a control group and treatment groups will be identified on the variables of PTG, symptoms of PTSD, and relationship adjustment of veterans with PTSD and their significant others.

Purpose of Study

The purpose of the study is to provide evidence-based outcomes related to the couple adaptive sport and recreation event participation that may justify the advocacy of couple adaptive sport and recreation involvement to facilitate posttraumatic growth, increase relationship adjustment, and reduce symptoms of PTSD for veterans with posttraumatic stress disorder and their significant others.

Significance of the Study

As was previously mentioned, 18.5% of returning service members from Iraq and Afghanistan meet the criteria for PTSD or depression (approximately 300,000 veterans) and only slightly more than half of those have sought treatment and received “minimally adequate treatment” (Tanielian & Jaycox, 2008, p. 108). Research has examined the impact of PTSD on the family. United States Vietnam veterans with PTSD were found to be less expressive, less cohesive, more violent, and more conflictual in their relationships than were veterans without PTSD (Carroll et al., 1985; Jordan et al., 1992; Solomon et al., 1987). Furthermore, PTSD among Australian Vietnam veterans was negatively correlated with lower family functioning (Evans et al., 2003). The National Vietnam Veterans Readjustment Survey (NVVRS) found that male Vietnam veterans with PTSD were twice as likely to have been divorced than non-PTSD

veterans (Jordan et al.; Kulka et al., 1990). Similar findings have been seen in the divorce rates among Iraq and Afghanistan troops in combat zones. In 2005, *USA Today* reported that divorces for enlisted personnel increased 28% from 2003 and 53% from 2000 (Zoroya, 2005). Joyce Wessel Raezer, the government relations director for the National Military Family Association (NMFA), summed it up when she said, "at the end of the day, wounded service members have wounded families" (Shane, 2005, "Alcohol, divorce among troops," para. 4).

In spite of the evidence that veterans with PTSD experience negative outcomes, researchers have started to find compelling evidence of positive life changes resulting from their traumatic combat experience (Dekel, 2007; Jennings, Aldwin, Levenson, Spiro III, & Mroczek, 2006; Maguen, Vogt, King, King, & Litz, 2006; Solomon & Dekel, 2007). These positive life changes are conceptualized as posttraumatic growth (PTG). Tedeschi, Park, and Calhoun (1998) stated, "posttraumatic growth is the antithesis of posttraumatic stress disorder, emphasizing that growth outcomes are reported even in the aftermath of the most traumatic circumstances, and even though distress coexists with this growth" (p. 3). Few empirical studies have examined the relationship of leisure and posttraumatic growth (Kleiber, Hutchinson, & Williams, 2002; Kleiber, Reel, & Hutchinson, 2008). Moreover, no empirical study has examined the relationship of leisure and posttraumatic growth for veterans with PTSD.

Based upon the evidence cited in the previous paragraphs, it appears that current veterans with symptoms of PTSD are likely to have lower couple satisfaction. However, these veterans could also experience posttraumatic growth from combat trauma. So what makes the difference between a veteran experiencing PTSD and their family relationships falling apart and PTG? Scholars have consistently reported a positive relationship between couple leisure involvement and aspects of family strength such as marital satisfaction, family adaptability and cohesion, and

better family functioning (Hawks, 1991; Holman & Epperson, 1989; Orthner & Mancini, 1991; Zabriskie, 2001). Scholars have also suggested that the single most important force in developing cohesive, healthy relationships between parents and their children, and between husbands and wives, is joint leisure involvement (Couchman, 1988, as cited in Canadian Parks/Recreation Association, 1997). While no studies have examined the relationship between posttraumatic growth and couple leisure involvement among couples that include veterans with PTSD, couple leisure may help create posttraumatic growth for veterans with symptoms of PTSD.

Delimitations

The scope of the study is delimited to the following:

1. This study will include 28 OIF/OEF veterans with symptoms of posttraumatic stress disorder and their 28 significant others (21 veteran couples for the three experiment groups and 7 veteran couples for the control group).
2. Responses will be collected from OIF/OEF veterans and his or her significant other.
3. Posttraumatic stress disorder will be measured with Posttraumatic Stress Disorders Checklist, Military Version (PCL-M) or Civilian Version (PCL-C) **(**Weathers, Litz, Henmin, & Keane, 1993)
4. Posttraumatic Growth will be measured with Posttraumatic Growth Inventory (PTGI) (Tedeschi & Calhoun, 1996).
5. Couple's level of relationship adjustment will be measured with the Revised Dyadic Adjustment Scale (RDAS) (Busby, Christensen, Crane, & Larson, 1995).
6. Data will be collected, beginning in January, 2010, until April, 2010.

Limitations

This study will be limited by the following factors:

1. Subjects who participate in this study will be volunteers who comply with the requirements of this investigation. Therefore, this study will use a convenience sample. As a result, the generalizability of the study's findings will be limited to the tested sample only.
2. Each questionnaire will be self-reported and may be influenced by social desirability in some respondents.

Assumptions

This study will be conducted based upon the following assumptions:

1. Valid and reliable inferences can be made from the PCL-M/C scale regarding symptoms of posttraumatic stress disorder.
2. Valid and reliable inferences can be made from the PTGI regarding posttraumatic growth.
3. Valid and reliable inferences can be made from the RDAS regarding adjustment in relationships.
4. Participants will be honest when completing the questionnaire.

Hypotheses

This study is designed to test the following null hypotheses:

H_{01}: Following completion of the therapeutic recreation program, Higher Ground, there will be no significant differences between the control group and the treatment groups for marital adjustment in veterans with PTSD and their significant others.

H_{02}: Following completion of the therapeutic recreation program, Higher Ground, there will be no significant differences between the control group and the treatment groups for PTG in veterans with PTSD and their significant others.

H_{03}: Following completion of the therapeutic recreation program, Higher Ground, there will be no significant differences between the control group and the treatment groups for symptoms of PTSD in veterans with PTSD and their significant others.

Definition of Terms

Couple. Couple in this study will refer to the veteran with PTSD and their significant other.

Operation Enduring Freedom. Operation Enduring Freedom in this study refers to the official name used by the U.S. Government for its military campaign in Afghanistan.

Operation Iraqi Freedom. Operation Iraqi Freedom refers to the military campaign in Iraq lead by troops in the United States and United Kingdom.

Posttraumatic growth. Posttraumatic growth, in this study, is defined as positive life changes in the aftermath of a traumatic event that occurred in combat (Tedeschi et al., 1998).

Posttraumatic stress disorder. For the purposes of this study, posttraumatic stress disorder is defined as an anxiety disorder after being exposed to a traumatic event such as combat or military exposure that results in three main symptoms: (a) re-experiencing, (b) avoidance and numbing of emotion, and (c) hyper arousal (National Center for PTSD, 2009).

Significant other. In this study, significant other refers to a person in the veteran's life that has an important influence in their lives, typically this will considered a spouse.

Veteran. In this study, veteran refers to a former soldier in OIF/OEF. Veterans from other wars will be referred to as a veteran from their specific war.

Chapter 2

Review of Literature

The problem of this study is to examine the effects of an adaptive sport and recreation program developed for couples, where one individual has recently returned from combat in OIF/OEF. Differences between a control group and treatment groups will be identified on the variables of PTG, symptoms of PTSD, and relationship adjustment of veterans with PTSD and their significant others. The literature related to veterans with PTSD, PTG, and couple leisure involvement will be presented in this chapter and will include the following topics: (a) PTSD, disability, and veterans, (b) PTG, (c) leisure and PTG, and (d) couple leisure.

PTSD, Disability, and Veterans

Researchers are just beginning to examine the effects of OIF/OEF on U.S. military personnel. They are examining areas of divorce rate, mental health, the effects of combat exposure, and traumatic brain injury (TBI) (Friedman, 2006; Hoge et al., 2004; Tanielian & Jaycox, 2008; Warden, 2006). During deployment in OIF/OEF about 320,000 soldiers have experienced a TBI (Tanielian & Jaycox). Among the findings concerning OIF/OEF veterans, there is an increase in TBIs. Warden believes that “possible reasons for an increase in closed TBI include the effectiveness of body armor in saving those who would have been killed previously, increased identification of closed TBI due to increased understanding of the potential sequelae of mild and moderate closed brain injury, and the prominence of blast as an injury mechanism” (p. 401). Klein, Caspi, and Gil (2003) suggest that a person with a mild TBI has a greater risk of developing PTSD than someone with longer periods of unconsciousness or severe brain injuries. TBIs are only one of the many injuries experienced during OIF/OEF.

In addition to TBIs, veterans are returning from OIF/OEF with physical disabilities including visual impairments, amputations, and others. Research reveals amputations occur twice as often in OIF than any other war in the past century (Weisskopf, 2007) and visual impairments have significantly increased (Zoroya, 2007). Only a few studies have examined the relationship between being wounded in war and PTSD. Not surprisingly, Hoge et al. (2004) found that the rates of PTSD were significantly positively related to being wounded or injured during OIF/OEF. The same findings were established for veterans of the Vietnam War. Injury in the Vietnam War increased the risk for PTSD two to threefold (Kulka et al., 1990). Wounded/injured veterans of OIF/OEF are experiencing PTSD at a greater rate than soldiers who are not wounded. Wounded/injured veterans have an increased need for interventions that can reduce symptoms of PTSD so they can function better in everyday life.

Friedman (2006) reported that symptoms of PTSD in military personnel have been found to affect their family relationships. He discussed a case where a father experienced great difficulty transitioning from a combat environment to the environment of home and civilian life. The father's combat environment was one of continual threat to his life by surprise attacks and deaths of colleagues. He had difficulties completing his civilian job responsibilities and household duties because he thought these activities were unimportant in comparison to just surviving each day in Iraq. He also had difficulty emotionally relating to his wife and children. He had experienced something most people in his civilian life will never experience or understand. This case demonstrates just some of the difficulties soldiers with symptoms of PTSD may have when they return to civilian life after being in combat.

Walsh (1998) reported that emotional expression, responsiveness, and regulation of emotion are the major features of close relationships. Symptoms of PTSD make the expression

of emotion challenging (Freidman, 2006). Emotional numbing (i.e., restricted affect, detachment from others, loss of interest in activities), a symptom of PTSD, has been shown to contribute to difficulties with intimate and family relationships (Friedman; Riggs et al., 1998). For example, they isolate themselves by becoming emotionally inaccessible and they are unable to experience loving feelings (Freidman). Thus, PTSD makes it difficult to reenter family life if they cannot share emotions with their family, especially their significant other.

Research over the past three decades has examined veterans of past U. S. military operations, mainly Vietnam veterans with PTSD, and the impact of their war experience on their intimate relationships. Veterans with PTSD were found to have considerable relationship problems (Card, 1987; Carroll et al., 1985; Jordan et al., 1992; Riggs et al., 1998; Waysman, Milkulincer, Solomon, & Weisenberg, 1993). For example, male Vietnam veterans had problems with marital and family adjustment, with parenting skills, decreased levels of self-disclosure, affection, sociability, intimacy, and cohesion, and increased levels of violence and conflict (Beckham et al., 1996; Carroll et al.; Jordan et al.; Lasko, Gurvits, Kuhne, Orr, & Pitman, 1994). They were also less satisfied with their intimate relationships (Carroll et al.; Jordan et al.; Riggs et al.). Veterans need help with their relationships, especially because 18.5% of veterans returning from OIF/OEF have symptoms of PTSD (approximately 300,000) (Tanielian & Jaycox, 2008). Posttraumatic stress disorder negatively affects veterans' relationships with their significant others and family when they return home.

Findings from Jordan et al. (1992) on significant others of Vietnam veterans suffering from PTSD compared to significant others of Vietnam veterans without PTSD indicated that they also reported significantly less satisfaction with their lives. In addition, Riggs et al. (1998) reported that these significant others experienced more relationship distress, more intimacy

difficulties, more problems in their relationships, and they took more steps toward separation. The Riggs et al. findings are substantiated, when examining wives of Israeli veterans with PTSD. Waysman et al. (1993) found that wives of Israeli veterans with PTSD had more psychiatric symptoms and impaired social relations when compared to wives of veterans without PTSD. They accredited this to rigid and conflictual family interactions. While the existing literature has provided useful information about the family functioning of veterans with PTSD and their spouses, it has done so primarily from the individual's point of view and mostly looking at veterans of previous wars. More research needs to be done to examine veterans of OIF/OEF with symptoms of PTSD and relationships with their significant other.

There is also a lack of research being done on the positive side of traumatic combat experiences from the veteran and significant other perspective. Focusing only on the negative and adverse effects of trauma can lead to a biased understanding of posttraumatic responses (Linley & Joseph, 2004). To understand responses to trauma and adversity, and to be considered comprehensive, research must examine the potential for positive as well as negative changes (Linley & Joseph).

PTG

These positive changes, after adversity, have only recently been examined by researchers. Tedeschi and Calhoun (2004) refer to positive psychological change, experienced after a struggle with an exceedingly stressful life event, as PTG. Posttraumatic growth refers to a change that occurs in people that goes beyond the ability to oppose and not be hurt by highly stressful circumstances (Tedeschi & Calhoun). Tedeschi and Calhoun explain, "posttraumatic growth is not simply a return to baseline-- it is an experience of improvement that for some persons is

deeply profound" (p. 4). The struggle with trauma is the crucial element for PTG (Tedeschi & Calhoun).

There are five major domains where individuals use this struggle with trauma to experience PTG: (a) greater appreciation of life, (b) more intimate relationships with others, (c) greater sense of personal strength, (d) recognition of new possibilities for one's life, and (e) spiritual development (Tedeschi & Calhoun, 2004). These five domains differentiate PTG from coping.

The first domain, a greater appreciation for life, refers to individuals having radically different priorities and appreciating the smaller things in life. According to Tedeschi and Calhoun (2004), the perspective of appreciating life more is a common element in people who have struggled with traumatic events. The second domain, more intimate relationships with others, refers to how people use their social supports to help them not only cope with the situation but create strong and more meaningful relationships with them (Tedeschi & Calhoun). The third domain, an increased sense of strength, is a growth in knowledge that bad things happen and the individual can now handle the situation (Tedeschi & Calhoun). The fourth domain explains how individuals identify new possibilities or a new path in life to create PTG (Tedeschi & Calhoun). The fifth domain refers to spiritual development that can be a religious or existential matter of growth (Tedeschi & Calhoun). These five domains of PTG represent the paradox: "that out of loss there is gain" (Tedeschi & Calhoun, p. 6). Posttraumatic growth has been examined in a wide variety of populations ranging from the bereaved (Calhoun & Tedeschi, 1989-1990) to veterans and combat exposure (Fontana & Rosenheck, 1998).

PTG and traumatic combat experience. As stated earlier, soldiers are being exposed to stressors and traumatic events in great magnitude and frequency in OIF/OEF (Aronson, 2005;

Friedman, 2006). Although there is abundant evidence that the experience of combat can have harmful psychological effects (e.g., Clipp & Elder, 1996; Hoge et al., 2004; Kulka et al., 1990; Tanielian, & Jaycox, 2008), there is evidence of positive effects as well (Aldwin, Levenson, & Spiro, 1994; Elder & Clipp, 1989; Jennings et al., 2006; Maguen et al., 2006).

According to Maguen et al. (2006), "soldiers, especially those who serve abroad during conflict, are exposed to a wide range of stressors, from generic low-magnitude stressors (e.g., being away from home) to high-magnitude stressors associated with war-zone experiences (e.g., death of a friend on the battlefield, injury to self, exposure to atrocities)" (p. 347). In spite of these traumatic experiences, there is evidence that military participation can often lead to enormous growth and maturity, becoming an important developmental milestone for soldiers (Dohrenwend et al., 2004; Elder, Gimbel, & Ivie, 1991; Gade, 1991). For example, Sledge, Boydstum, and Rabe (1980) found that over 90% of American air-force officers that were POWs in the Vietnam War viewed their changes following captivity as favorable, including a clearer concept of priorities in life and a greater understanding of self and others.

Maguen et al. (2006) found, "relating to others, personal strength, and PTG as a whole were best predicted by the post-deployment variable of social support" (p. 383). A strong social support is necessary for soldiers when they return home in order for them to grow in these ways. They also found that the strongest predictor for appreciation of life was perceived threat to their life while deployed. Maguen et al. believe these findings could have implications for veterans with PTSD and call for studies to explore the relationship between PTSD and PTG.

Solomon and Dekel (2007) surveyed Israeli POWs and found that ex-POWs had higher levels of PTSD and PTG than the control group. Solomon, Waysman, and Neria (1999) found no correlation between PTSD measures and positive changes among Israeli POWs. This shows that

PTSD and PTG can both occur in the same person concurrently (Solomon et al.). The distress veterans with PTSD experience is not necessarily indicative of an absence of psychological growth and they are not mutually exclusive (Solomon & Dekel). These findings "indicate that even when a person is able to grow and experience positive changes following trauma, this does not undo the ongoing suffering that the event has created" (Solomon & Dekel, p. 309). Psychological development and growth is, in many cases, not interfered with by negative posttraumatic effects (Solomon & Dekel).

Jennings et al. (2006) studied 615 men from the Normative Aging Study. The impact of combat exposure and the perception of benefits from military experience earlier in life, assessed in 1990, were associated with the development of wisdom later on in life, assessed in 2001. A higher level of wisdom later in life was associated with moderate levels of combat (Jennings et al.). Wisdom was predicted by the perception of benefits and coping (Jennings et al.). Jennings et al. believe, "how one appraises and copes with problems may be more important in the prediction of positive adaptation than the simple occurrence of stress" (p. 115).

Veterans demonstrated positive psychological outcomes from combat exposure according to the studies previously cited. However, a need to examine positive influences on PTG in veterans and their significant others is critical for further progress. Leisure participation is one method that can provide growth from negative life events (Kleiber et al., (2002).

Leisure and PTG

Leisure can be used in a variety of ways to adjust or cope with stressful situations, "some of which may even be growth-producing" (Kleiber et al., 2002, p. 219). As stated earlier, PTG brings about changes in perception of self and changed interpersonal relationships (Tedeschi & Calhoun, 2004). Posttraumatic growth also is likely to reflect a greater appreciation of the

smaller things in life and to make the most of every moment. Kleiber et al. believe leisure would "be an important context for such transformative experiences" (p. 221).

Researchers on PTG have concentrated research primarily on the personality traits that influence a person to positive reappraisal or with the differences in the individual as a result of the event (Tedeschi et al., 1998). Little attention has been given to the dynamics of positive reappraisal in leisure and leisure's ability to create growth.

Studies done on the relationship between leisure and stress generally places leisure as a buffer between stressful situations and the propensity to give into that stress and develop symptoms of both physical and psychological illness (see Iwasaki & Smale, 1998, for review of this literature). Leisure has been mostly seen as a way to cope with stressful events. There is some support that leisure involvement does indeed moderate the impact of traumatic events on various symptoms (e.g., Wheeler & Frank, 1988). Just how this happens is uncertain.

Coleman and Iso-Ahola (1993) believe activity participation gives a kind of inoculating competence and when participation is social it provides the support necessary to endure and manage stress. Iso-Ahola and Park (1996) also discovered that leisure based friendships moderated the effect of life stress on psychological health (depressive symptoms) and that leisure companionship moderated the effect of life stress on physical health (illness-related symptoms). Specifically, for those people who reported higher levels of leisure companionship, illness and depression symptoms did not increase as much with high levels of life stress. Iwasaki and Mannell (2000) found that those who usually saw the worth of leisure for empowerment and friendship were less affected by the daily disturbances that negatively affected the mental health of others.

Kleiber et al. (2002) propose “four functions of leisure in transcending negative life events” (p. 225). Leisure activity functions are: (a) to distract, (b) generate optimism about the future, (c) aide in the reconstruction of a life story that is continuous with the past, and (d) a vehicle for personal transformation (Kleiber et al.).

Kleiber et al. (2002) explain that leisure activities can be used as a distraction to offer individuals, who are overwhelmed by negative emotion, a break from those emotions. Diverting an individual from negative feelings through leisure gives them temporary relief from the negative life event, thus enabling them to start distancing themselves from the losses associated with the event (Folkman & Moskowitz, 2000). Kleiber et al. state, “the vulnerability experienced in the wake of a negative life event is thus mitigated by diversionary activities” (p. 226). In particular, leisure coping is “a temporal break through leisure which allows people to feel refreshed and regroup to better handle problems” (Iwasaki, 2001, p. 131) and leisure mood enhancement is “the enhancement of positive mood or the reduction of negative mood through leisure to regulate emotions/moods of individuals under stress” (Iwasaki, p. 131) are reflective of the ways leisure can be considered a source of emotion-focused coping. Iwasaki and Mannell (2000) found that students who used leisure when they are stressed academically, for purposes of escape and distraction showed higher levels of psychological well-being.

The second function of leisure is generating optimism about the future (Kleiber et al., 2002). By first creating a distraction, leisure can make room for the individual to take control, to some extent, and envision alternative possibilities in life. Humor, a leisure catalyst, creates the kind of diversion that is comforting in a way that allows the restructuring of the experience of stressful events (Williams, 2000). Humor helps people gain a new perspective on otherwise upsetting situations. Leisure can have the power to regain hope for one’s future even though their

life is in grim circumstances. As Lazarus, Kanner, and Folkman (1980) stated, “positively toned emotions reinforce successful new activities and, by virtue of their intrinsic pleasurable nature, help put the person in a different, more optimistic ‘state of mind’” (p. 212). Positively-toned experiences generate both emotional strengthening and an opening up for cognitive revision.

The third function of leisure is aiding in the reconstruction of a life story that is continuous with the past (Kleiber et al., 2002). Individuals can maintain interest they had prior to the injury by using adaptive technology to participate in their favorite pastimes. Leisure, in this function, offers a way for people to get back to normal. The main priority is to establish a connection with the individuals’ identity from their past.

The fourth function of leisure is a vehicle for personal transformation (Kleiber et al., 2002). This function connects with posttraumatic growth well. The first three functions of leisure to transcend negative life events make it possible for this fourth function: personal transformation. Without the first three functions accomplished, transformation or PTG cannot occur. Posttraumatic growth suggests a reconstruction of self that occurred because one’s life was disturbed in a significant way. Reconstructing a future through leisure can be both pleasurable and meaningful. Assuming people are intentional beings, capable of restoring their life, a disruption can allow for a rewrite of their story rather than just fixing it (Brock & Kleiber, 1994). Transformation applies to a change, and leisure often plays a leading role in this development (Kleiber et al.). Further studies need to be done to look at leisure’s ability to generate positive emotions that could assist in transcending traumatic events.

Chun and Lee (2007) found that leisure contributed to PTG for people with spinal cord injury (SCI) in four ways: (a) providing opportunities to experience success and achievement, (b)

building meaningful relationships, (c) making sense of traumatic experience and finding meaning in everyday life, and (d) generating positive emotions.

Chun and Lee (2007) found that leisure promoted PTG by providing people with SCI an avenue to experience success and achievement in their lives when other aspects of their lives were not succeeding. They would approach leisure activities more seriously than they did before their SCI and find unique abilities and hidden potential through participation in leisure activities. Leisure involvement helped them regain confidence that they had lost because of their SCI (Chun & Lee, 2008)

The second way Chun and Lee (2007) found leisure to help with PTG was by building meaningful relationships. Leisure provided a way for the patients with SCI to experience emotional intimacy, gaining trust in others, and mutuality in relationships (Chun & Lee, 2008). Chun and Lee (2008) believe, “emotionally intimate relationships appear to be a critical PTG experience because they not only allow the participants to experience a sense of belonging and attachment but give them a reason to live well” (p. 881). Tedeschi and Calhoun (2004) also explain, “social support[s] may play a strong role in the development of posttraumatic growth when [they] remain stable and consistent over time” (p. 11). Leisure provides a way for patients with SCI to connect more intimately with others and produce strong social supports. Development of “posttraumatic growth may mutually influence one another” (Tedeschi & Calhoun, p. 12).

Leisure was seen to facilitate PTG by helping to make sense of the traumatic experience and finding meaning in everyday life (Chun & Lee, 2007). Participating in activities allowed people with SCI to reevaluate their traumatic experience and realize their accidents occurred by

chance (Chun & Lee). Volunteering, according to Chun and Lee, was one of the most meaningful activities the patients with SCI did that contributed to finding meaning in their lives.

The last way Chun and Lee (2007) found leisure to contribute to PTG was by generating positive emotion. These emotions were interest, enjoyment, excitement, fun, self-worthiness, and relaxation (Chun & Lee). According to Lazarus et al. (1980), positive emotions provide three psychological functions to coping: as breathers from stress, as sustainers of coping effort and commitment, and as restorers. A breather can free one temporarily from a stressful experience and also engage in enjoyable diversionary activities (Lazarus et al.). Positively-toned emotions, such as hope, challenge, or excitement, also serve to sustain coping efforts. Lastly, positively-toned emotions may have an effect of restoring self-esteem or hope by facilitating the individual's renewal of damaged or depleted resources and/or developing new ones (Lazarus et al.). Lazarus et al. think that pleasurable experiences that do not require much risk may serve to stop a depressive mind set. This will remind the person of alternative, more enjoyable ways to participate and appraise his or her world. These studies propose that the probability of leisure to produce positive emotion may assist in effective coping and adjustment to negative life events or PTG (Chun & Lee; Lazarus et al.).

The Chun and Lee studies (2007, 2008) and Kleiber et al. (2002) provides empirical support for leisure as a tool to facilitate PTG. There is still a need for more research on the role of leisure in experiencing PTG. More research would only help to expand the understanding of leisure in the context of PTG. One avenue for research could be couple leisure involvement.

Couple Leisure

As stated earlier, couples including veterans with PTSD and other disabilities are at greater risk for marital dissolution, instability, and dissatisfaction (Card, 1987; Carroll et al.,

1985; Jordan et al., 1992; Riggs et al., 1998; Waysman et al., 1993). Leisure participation and marital satisfaction has been extensively studied (Crawford, Houts, Huston, & George, 2002; Holman & Epperson, 1989; Holman & Jacquart, 1988; Johnson, Zabriskie, & Hill, 2006; Orthner, 1975; Orthner & Mancini, 1990). Researchers examining marital relationships have found positive associations between couple leisure participation and family life and/or marital satisfaction (Holman, 1981; Holman & Jacquart; Miller, 1976; Orthner; Smith, Snyder, & Monsma, 1988; Zabriskie & McCormick, 2003).

Orthner stated in 1975, “overall, the data support the conclusion that the leisure factor is the most critical in determining marital satisfaction” (p. 101). Orthner has continued this line of research with several other studies. Orthner and Mancini (1990) stated that greater quantity of shared leisure time increases spousal understanding. Orthner and Mancini (1990; 1991) found joint couple leisure involvement to be influential in marital satisfaction. Other researchers have examined couple leisure and marital outcomes.

Couples that participate in joint leisure together tend to have more satisfaction in their marriages (Baldwin, Ellis & Baldwin 1999; Holman & Jaquart, 1988). Couple participation in enjoyable leisure contributes to developing joint interests and identities (Fincham, Beach, & Kemp-Fincham, 1997). The Hill (1988) research demonstrated when couple leisure time increased from 1.7 hours per week to 4.9 hours per week on average it reduced the probability of marital dissolution by half. Also Smith et al. (1988) found their study “confirms the importance of couples’ use of discretionary time as a predictor of overall relationship satisfaction” (p. 11).

Researchers have examined the relationship between couples spending time together, couple leisure involvement, and satisfaction with couple leisure involvement with marital satisfaction. Johnson et al. (2006) concluded “it was not the level or amount of couple leisure

involvement or the satisfaction with the amount of time spent together, but the satisfaction with couple leisure that contributes to marital satisfaction" (p. 83). In other words, marital satisfaction was not related to the increased time, satisfaction with increased time, type of leisure involvement, or satisfaction with the type of leisure involvement. It appears overall quality or satisfaction with couple leisure involvement is the major factor in marital satisfaction.

According to Orthner (1975), if couples are experiencing difficulty in their marriage, they have a reduction in a desire to participate in activities together; this could increase the conflict in their relationship. Increasing couple leisure participation may help reduce the negative side effect of difficulties in marriage. Overall, past research acknowledges a link between couple leisure participation and marital satisfaction. These studies validate couple leisure involvement for couples with a veteran with PTSD may have a positive relationship to their marital satisfaction. Sun Valley Adaptive Sports has designed a program for veterans with PTSD and their significant others to participate in couple leisure.

Higher Ground. Sun Valley Adaptive Sports (SVAS) is a non-profit organization that provides people with disabilities the opportunity to participate in sports and recreation. The SVAS has winter and summer programs for children, teens, adults, and wounded warriors. Participants have a wide range of disabilities: physical, developmental, emotional, and learning. The SVAS's wounded warrior program is called Higher Ground.

Higher Ground is an adaptive sports program for individuals who have been severely wounded in OIF/OEF, and their significant others. It is a five-day therapeutic recreation program where they participate, as a couple, in a variety of adaptive sports including water skiing, kayaking, river rafting, canoeing, fly-fishing, skiing/snowboarding, ice skating, and Nordic skiing depending on the season they participate in the program. Higher Ground is using couple

adaptive sports participation as a means of healing and therapy. The goals of Higher Ground are to build sports skills and confidence, improving personal relationships, and increase ability to cope and grow from combat related stress. A pilot study was done on three Higher Ground programs looking at outcomes related to quality of life, mood states, and sports related competence in veterans, significant reductions were found in total mood disturbance, tension, depression, and anger and significant increases were found in vigor and sports related competence (Bennett, Lundberg, & Smith, 2009). The Higher Ground programs need to specifically study the goals of the program (relationship adjustment, decrease in PTSD, and PTG) for both the veteran and their significant other.

The Higher Ground programs in this study will be all winter therapeutic recreation programs that give the veterans a choice of participating in skiing, snowboarding, ice skating, snowshoeing, or Nordic skiing. Each day will have a theme that directs the veterans and their significant other to the different goals of the Higher Ground program. The themes will be communication, improve relationships through recreation, identifying stress triggers and how to manage stress through recreation, and building on the positives of the week and growing from them. They will have a question at dinner to discuss and a journal question to write about each night that goes along with the theme of the day. Researchers have not examined the outcomes of a specific couple leisure event and its impact on veterans and their significant others.

Due to the cited research on PTSD and PTG, their effects on emotions and relationships, it is likely that a connection may exist between PTSD, PTG, and couple participating in a therapeutic leisure event. Therefore, the purpose of this study is to examine the differences between treatment groups, who participate in the Higher Ground therapeutic recreation program, and a control group in regards to PTG, symptoms of PTSD, and relationship adjustment among

veterans with PTSD from OIF/OEF and their significant others. Significant results from this study may be able to help veterans and their significant others have better relationships, less symptoms of PTSD, and grow from their combat experiences.

Chapter 3

Methods

The problem of this study is to examine the effects of an adaptive sport and recreation program developed for couples, where one individual has recently returned from combat in OIF/OEF. Differences between a control group and treatment groups will be identified on variables including PTG, symptoms of PTSD, and relationship adjustment of veterans with PTSD and their significant others. This chapter is organized as follows: (a) selection of subjects, (b) instrumentation, (c) design of study, (d) data collection, and (e) data analysis.

Selection of Subjects

A convenience sample of veterans with symptoms of posttraumatic stress disorder and their significant others who are attending a camp at Sun Valley Adaptive Sports (SVAS) for veterans with disabilities from Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF) will be selected to participate. The SVAS is an organization that offers adaptive sports and recreation programs to people of all abilities in Sun Valley, Idaho. There will be a control group and three treatment groups consisting of approximately seven couples in each of the four groups. Each couple participating in the treatment groups will consist of one veteran with symptoms of posttraumatic stress disorder (PTSD) and /or other disabilities (i.e. traumatic brain injury, amputation, visual impairment, spinal cord injury, etc.) and one significant other (n = 42). The control group will be selected from veteran couples that will be participating in future SVAS program. If this does not produce enough couples then we will get the remainder of the veteran couples from the Wade Park VA Hospital in Cleveland, OH. These couples will also consist of one veteran with symptoms of PTSD and other similar disabilities to the treatment groups and one significant other for the control group (n = 14).

Instrumentation

The research questionnaire will include the following instruments: (a) the 14-item Revised Dyadic Adjustment Scale (RDAS) measures couple's level of relationship satisfaction (see Appendix A), (b) the 17-item Posttraumatic Stress Disorder Checklist, Military Version (PCL-M) or Civilian Version (PCL-C) measures PTSD as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV*; American Psychiatric Association, 1994) (see Appendix B), and (c) the 21-item Posttraumatic Growth Inventory (PTGI) measures the growth across the dimensions of relating to others, new possibilities, personal strength, spiritual change, and appreciation of life (see Appendix C). Sociodemographic data such as family income, gender, time lapsed from traumatic experience, physical disabilities, age, and ethnicity will be included (see Appendix E).

Revised Dyadic Adjustment Scale. The RDAS measures couple's level of relationship satisfaction. It is a 14-item self-report instrument. The RDAS generates a total score and three subscale scores: Consensus, Satisfaction, and Cohesion. Consensus measures the amount of agreement or disagreement in the couple's decision making, affection, and values. Satisfaction is assessed with the stability and level of conflict of the couple. Cohesion is measured by the degree couples engage in discussions and activities with each other. They are asked to rate the extent of agreement or disagreement between them and their partner for each item. Their answers are measured on a 6-point Likert-type scale ranging from 0 (*never*) to 5 (*always*). Busby et al. (1995) stated, "the reliability coefficients are within acceptable ranges and demonstrate that the RDAS has internal consistency" (p. 303) with a Chronbach's Alpha of 0.90.

Posttraumatic Stress Disorder Checklist, Military/Civilian Version. The PCL-M/C measures posttraumatic stress disorder symptoms **(**Weathers et al., 1993). It is a 17-item self

report instrument. Respondents rate the degree they have been bothered by symptoms of PTSD, as defined by the *DSM-IV* (American Psychiatric Association, 1994), within the last week. Their answers are measured on a 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*extremely*).

Scores for the PCL-M/C will be calculated by summing all the items for a total severity score. Research supports the screening classification of PTSD in a combat veteran population using a global cut-off score of 50 or greater (Forbes, Creamer, & Biddle, 2001). The instrument's scores ranging from 35 to 49 were categorized as subthreshold PTSD. Those who scored less than 35 were categorized as non-PTSD (i.e., bothered no more than *a little bit* on any of the items).

The PCL-M/C has demonstrated good psychometric properties. The test-retest reliability is .96 and .97 for internal consistency for all 17 symptoms. A .85 convergent validity was demonstrated by a strong correlation between PCL-M and the Mississippi Scale (Weathers et al., 1993).

Posttraumatic Growth Inventory. The PTGI (Tedeschi & Calhoun, 1996) measures positive outcomes following traumatic events. This 21-item measure is scored on a 6-point ordinal scale (0 = no change, 1 = a very small degree, 2 = a small degree, 3 = a moderate degree, 4 = a great degree, 5 = a very great degree). The PTGI total scores range from 0 to 105; higher scores signify more growth. The PTGI consists of five factors: (a) appreciation of life (e.g., "A greater appreciation for the value of my own life"), (b) relating to others (e.g., "a greater sense of closeness with others"), (c) new possibilities (e.g., "Developed new interests"), (d) personal strength (e.g., "a greater feeling of self-reliance"), and (e) spiritual change (e.g., "a stronger religious faith"). The internal consistency for the entire scale was $\alpha = .90$ and the subscale reliabilities are $\alpha = .67$ for appreciation of life, $\alpha = .85$ for relating to others, $\alpha = .84$

for new possibilities, $\alpha = .72$ for personal strength, and $\alpha = .85$ for spiritual change (Tedeschi & Calhoun). The PTGI has a test-retest reliability of $r = .71$ (Tedeschi & Calhoun). The PTGI will be scored by summing all the responses to obtain a total growth score. The five factors are scored by summing the corresponding items to each factor.

Design of Study

Participants will be recruited from all couples attending the SVAS Higher Ground program for veterans with PTSD from the OIF/OEF. Those couples, who choose to participate in the research study, will sign a consent form (see Appendix D) and complete the pretest before the beginning of the program. Data will be collected over a four-month period, from the January of 2010 to April of 2010. The camps will last 5 days. The couples participating in the camps will choose from activities including ski/snowboard, ice skating, snowshoeing, and Nordic skiing. The control group will participate in their normal daily activities. After completing the program, both the participants of the program and the control group will take a posttest with similar questions as the pretest. The pretest and posttest will be administered by the facility's staff that has been trained in how to administer this questionnaire. Posttest will be linked to the corresponding individual's pretest. Completed submissions will be entered into a password protected email account accessible by the researchers only.

Data Collection

There will be separate questionnaires given to the veteran and the significant other. Each questionnaire will be assigned a subject number that will allow the researcher to keep the responses grouped by couples. The subject numbers will be assigned randomly, and any information that ties subject numbers to specific couple will be accessible only by the

researchers. The instruments in this study do not require any confidential personal identification information such as social security number.

The principle researcher will be the only person with access to responses. Data will be kept in a locked file cabinet, in a locked office on Brigham Young University campus. After all necessary information and responses are gathered, analyzed, and reported, all questionnaires will be shredded.

Data Analysis

The data will be collected by paper questionnaires and the following steps will be used in the analysis process. First, the paper questionnaires will be entered into the statistical package SPSS spreadsheet by the researcher so that all data is organized in the same fashion. Second, the data will be thoroughly cleaned by reviewing the data for any missing entries during data entry or outliers. Outliers will be examined, if any, to be sure they fit within the sample parameters and deleted if necessary. Third, all reverse items will be recoded and individual variables will be tabulated in the statistical software. Fourth, demographic questions will have descriptive statistics executed, that will describe the characteristics of the research sample. Fifth, an Analysis of Co Variance (ANCOVA) set at an α-level of .05, adjustments will be made to the α-level if needed, will be used to test the null hypotheses, where pretest scores will be used as covariates and posttest scores will be examined for differences between all groups on the following variables: (a) PTG totals, (b) PTGI subscales, (c) PTSD totals, (d) PCL subscales, (e) relationship adjustment, and (f) RDAS subscales for the veterans with PTSD and their significant others separately. Finally, the results will be interpreted and written up in an official research document.

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Appendix A-1

Revised Dyadic Adjustment Scale (RDAS)

Revised Dyadic Adjustment Scale (RDAS)

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list.

	Always Agree	Almost Always Agree	Occasionally Agree	Frequently Disagree	Almost Always Disagree	Always Disagree
Religious matters						
Demonstration of affection						
Making major decisions						
Sex relations						
Conventionality (correct or proper)						
Career decisions						

	All the Time	Most of the Time	More Often than Not	Occasionally	Rarely	Never
How often do you discuss or have you considered divorce, separation, or terminating your relationship?						
How often do you and your partner quarrel?						
Do you ever regret that you married (or lived together)?						
How often do you and your mate “get on each other’s nerves”?						

	Every Day	Almost Every Day	Occasionally	Rarely	Never
Do you and your mate engage in outside interests together?					

	Never	Less than once a month	Once or twice a month	Once or twice a week	Once a day	More often
Have a stimulating exchange of ideas						
Work together on a project						
Calmly discuss something						

Appendix A-2

Posttraumatic Stress Disorder Checklist, Military Version (PCL-M)

Posttraumatic Stress Disorder Checklist, Civilian Version (PCL-C)

Posttraumatic Stress Disorder Checklist, Military Version (PCL-M)

INSTRUCTIONS: Below is a list of problems and complaints that veterans sometimes have in response to stressful military experiences. Please read each one carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

	Not at all (1)	**A little bit (2)**	**Moderately (3)**	**Quite a bit (4)**	**Extremely (5)**
1. Repeated, disturbing *memories, thoughts, or images* of a stressful military experience ?					
2. Repeated, disturbing *dreams* of a stressful military experience?					
3. Suddenly *acting* or *feeling* as if a stressful military experience *were happening* again (as if you were reliving it)?					
4. Feeling *very upset* when *something reminded* you of a stressful military experience?					
5. Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of a stressful military experience?					
6. Avoid *thinking about* or *talking about* a stressful military experience or avoiding *having feelings* related to it?					
7. Avoid *activities* or *situations* because they *remind you* of a stressful military experience?					
8. Trouble *remembering important parts* of a stressful military experience?					
9. Loss of *interest in things that you used to enjoy?*					
10. Feeling *distant* or *cut* off from other people?					

11. Feeling *emotionally numb* or being unable to have loving feelings for those close to you?					
12. Feeling as if your *future* will somehow be *cut short*?					
13. Trouble *falling* or *staying asleep*?					
14. Feeling *irritable* or having *angry outbursts*?					
15. Having *difficulty concentrating*?					
16. Being *"super alert"* or watchful on guard?					
17. Feeling *jumpy* or easily startled?					

Posttraumatic Stress Disorder Checklist, Civilian Version (PCL-C)

Instruction to patient: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, put an "X" in the box to indicate how much you have been bothered by that problem *in the last month*.

	Not at all (1)	**A little bit (2)**	**Moderately (3)**	**Quite a bit (4)**	**Extremely (5)**
1. Repeated, disturbing *memories, thoughts, or images* of a stressful experience from the past?					
2. Repeated, disturbing *dreams* of a stressful experience from the past?					
3. Suddenly *acting* or *feeling* as if a stressful experience *were happening* again (as if you were reliving it)?					
4. Feeling *very upset* when *something reminded* you of a stressful experience from the past?					
5. Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of a stressful experience from the past?					

6. Avoid *thinking about* or *talking about* a stressful experience from the past or avoid *having feelings* related to it?					
7. Avoid *activities* or *situations* because they *remind you* of a stressful experience from the past?					
8. Trouble *remembering important parts* of a stressful experience from the past?					
9. Loss of *interest in things that you used to enjoy?*					
10. Feeling *distant* or *cut* off from other people?					
11. Feeling *emotionally numb* or being unable to have loving feelings for those close to you?					
12. Feeling as if your *future* will somehow be *cut short*?					
13. Trouble *falling* or *staying asleep*?					
14. Feeling *irritable* or having *angry outbursts*?					
15. Having *difficulty concentrating*?					
16. Being *"super alert"* or watchful on guard?					
17. Feeling *jumpy* or easily startled?					

Appendix A-3

Posttraumatic Growth Inventory (PTGI)

Posttraumatic Growth Inventory

Indicate for each of the following statements the degree to which the change reflected in the question is true in your life as a result of your combat experience, using the following scale:

0 = I did not experience this change as a result of my combat experience.
1 = I experienced this change to a very small degree as a result of my combat experience.
2 = I experienced this change to a small degree as a result of my combat experience.
3 = I experienced this change to a moderate degree as a result of my combat experience.
4 = I experienced this change to a great degree as a result of my combat experience.
5 = I experienced this change to a very great degree as a result of my combat experience.

1. I changed my priorities about what is important in life. _____
2. I have a greater appreciation for the value of my own life. _____
3. I developed new interests. _____
4. I have a greater feeling of self-reliance. _____
5. I have a better understanding of spiritual matters. _____
6. I more clearly see that I can count on people in times of trouble. _____
7. I established a new path for my life. _____
8. I have a greater sense of closeness with others. _____
9. I am more willing to express my emotions. _____
10. I know better that I can handle difficulties. _____
11. I am able to do better things with my life. _____
12. I am better able to accept the way things work out. _____
13. I can better appreciate each day. _____
14. New opportunities are available which wouldn't have been otherwise. _____
15. I have more compassion for others. _____
16. I put more effort into my relationships. _____
17. I am more likely to try to change things which need changing. _____
18. I have a stronger religious faith. _____
19. I discovered that I'm stronger than I thought I was. _____
20. I learned a great deal about how wonderful people are. _____
21. I better accept needing others. _____

Appendix A-4

Perceived Competence Scale (PCS)

Perceived Competence Scale

	Not at all true (1)	(2)	(3)	Somewhat True (4)	(5)	(6)	Very True (7)
I feel confident in my ability to participate in sports.	☐	☐	☐	☐	☐	☐	☐
I feel capable of participating in sports.	☐	☐	☐	☐	☐	☐	☐
I am able to independently participate in sports.	☐	☐	☐	☐	☐	☐	☐
I am able to meet the challenges of participating in sports.	☐	☐	☐	☐	☐	☐	☐

Appendix A-5

Leisure Satisfaction Scale (LSS)

Leisure Satisfaction Scale

	Not at all true (1)	(2)	(3)	Somewhat True (4)	(5)	(6)	Very True (7)
My recreational activities give me self-confidence.	☐	☐	☐	☐	☐	☐	☐
My recreational activities give me a sense of accomplishment.	☐	☐	☐	☐	☐	☐	☐
My recreational activities help me learn about myself.	☐	☐	☐	☐	☐	☐	☐
My recreational activities help me learn about other people.	☐	☐	☐	☐	☐	☐	☐
I have social interaction with others through recreational activities.	☐	☐	☐	☐	☐	☐	☐
My recreational activities have helped me to develop close relationships with others.	☐	☐	☐	☐	☐	☐	☐
My recreational activities help me to relax.	☐	☐	☐	☐	☐	☐	☐
My recreational activities help relieve stress.	☐	☐	☐	☐	☐	☐	☐
I do recreational activities which develop my physical fitness.	☐	☐	☐	☐	☐	☐	☐
My recreational activities help me to stay healthy.	☐	☐	☐	☐	☐	☐	☐

Appendix A-6

Level of Support

Level of Support

Please rate your veteran's need for support (providing aid or assistance) in the following areas, based upon the following criteria:

1 = Intermittent: Supports are provided on an "as needed" basis, temporary, or infrequent in a few settings.
2 = Limited: Supports are provided on a regular basis for a short period of time, in several settings.
3 = Extensive: Supports are needed regularly in several settings and may extend over long periods of time.
4 = Pervasive: Supports are constant and intense in all settings. They might be life-sustaining.

	Intermittent (1)	Limited (2)	Extensive (3)	Pervasive (4)
Self-Care (toileting, eating, dressing, hygiene, grooming)	☐	☐	☐	☐
Communication (understand others and express self)	☐	☐	☐	☐
Home Living (Clothing care, housekeeping, cooking, home safety)	☐	☐	☐	☐
Social Skills (interact with others, cope with demands, obey rules, peer acceptance) explain to people why your spouse is acting the way they are	☐	☐	☐	☐
Community Use (travel, shop, use public facilities, church)	☐	☐	☐	☐
Self-Direction (make choices, follow a schedule, seek assistance, resolve problems)	☐	☐	☐	☐
Health & Safety (illness identification, basic first aid, physical fitness)	☐	☐	☐	☐
Formalities (paying bills, filling out paperwork)	☐	☐	☐	☐
Leisure (play, recreational activities, personal choice)	☐	☐	☐	☐
Work (part or full time job, related work skills, money management)	☐	☐	☐	☐

	Intermittent (1)	Limited (2)	Extensive (3)	Pervasive (4)
Mobility (ability to get from one place to another)	☐	☐	☐	☐

Appendix A-7

Satisfaction with Program

Satisfaction with Program

Please answer the questions to the left about your experience with the Higher Ground program:

	Terrible	Poor	Okay	Good	Very Good	Excellent
Activity selection	☐	☐	☐	☐	☐	☐
Program organization	☐	☐	☐	☐	☐	☐
Social activity selection	☐	☐	☐	☐	☐	☐
Did the program exceed your expectations?	☐	☐	☐	☐	☐	☐
Satisfaction of participation with your significant other	☐	☐	☐	☐	☐	☐
Satisfaction with the overall program	☐	☐	☐	☐	☐	☐

Appendix A-8

Demographic Questions

Demographic Questions

Please provide the following demographic information. The information will only be used to make statistical comparisons between different groups of respondents.

1. What is your gender? ☐ Male ☐ Female

2. How old are you?_____

3. Which of the following best represents the highest level of education that you have completed?

☐ Some high school or less
☐ High school graduate
☐ Attended some college
☐ Associates degree
☐ Bachelors degree
☐ Post-college graduate

4. Are you currently employed?
☐ Yes, full time ☐ Yes, part time (30 hours or less per week) ☐ No

5. What is your marital status?
☐ Single, never married ☐ Married
☐ Separated or divorced ☐ Widowed

6. What is your ethnicity?
☐ Caucasian ☐ African-American ☐ Hispanic ☐ Others

7. Which of the following best describes your total household income before taxes last year?

☐ Not interested in reporting ☐ Under $5,000 ☐ $5,000- 9,999 ☐ $10,00 - 19,999
☐ $20,000- 29,999 ☐ $30,000 - 39,999 ☐ $40,000 – 49,999 ☐ $50,000 – 59,999
☐ $60,000- 69,999 ☐ $70,000 - 79,999 ☐ $80,000 – 89,999 ☐ $90,000- 99,9999
☐ $100,000+

8. What is your disability? (Please check all that apply)

☐ Amputation (arm) ☐ Amputation (leg) ☐ Brain Injury ☐ Blindness
☐ Seizures ☐ Hearing impairment ☐ Cognitive setback
☐ Orthopedic Impairment (bone/muscle impairment)
☐ Paraplegia ☐ Quadriplegia ☐ Posttruamatic Stress Disorder

☐ Visual Impairment ☐ Other

9. What was your age at the onset of your injury/disability? _____

10. How long have you had your injury/disability?

☐ Less than 6 months
☐ Between 6 months and 1 year
☐ 1-2 years
☐ 2-3 years
☐ 3-4 years
☐ 4-5 years
☐ More than 5 years

11. Have you participated in other sports and recreation programs since your injury/disability?
☐ Yes ☐ No

12. What is your current duty status?

13. What branch of the military are you in?

14. What is your rank?

15. How many years have you been in the military?

Appendix A-9

Informed Consent Form

Evaluating the Sun Valley Adaptive Sports Higher Ground Program
Consent to be a Research Subject

Introduction
The research study is being conducted by Neil Lundberg, Ph.D., Ramon Zabriskie, Ph.D., and Jessie Bennett, a graduate student at Brigham Young University. The purpose of this research is to study couple adaptive sport and recreation participation. You were invited to participate because you are enrolled in the Sun Valley Adaptive Sports Higher Ground Program.

Procedures
You will be asked to take a pretest at home or upon arrival at SVAS. A posttest will be taken at the end of the Higher Ground program at SVAS. This pretest and posttest must be filled out separately to protect the privacy of each individual and then place the completed questionnaire in a sealed envelope. The pretest and the posttest questionnaires will take approximately 45 minutes to an hour each to complete. You will be expected to be honest and forthright with your answers. The questions will include details about your relationship with your significant other, posttraumatic stress disorder symptoms (PTSD), posttraumatic growth (PTG), and demographic questions.

Risks/Discomforts
There will be minimal risks for participating in this study. However, you may feel emotional discomforts when answering questions about marriage, posttraumatic stress disorder symptoms, and current level of functioning. These discomforts will be lessened by having each individual fill out their questionnaire separately and then placing the completed questionnaire in a sealed envelope.

Benefits
There are no direct benefits to you for participating in this study. However, society may benefit from the knowledge of what this study discovers concerning veterans with PTSD and their significant other in relation to improving marital relations, increasing PTG, and decreasing symptoms of PTSD through couple leisure participation.

Confidentiality
Your identity as a subject of this study will be kept confidential to all outside of this study, but the researchers. You will not be personally identified in any publications, text, presentations, or conversations dealing with this study. Confidentiality will be maintained by the researcher concerning personal information given out, by you, in this study. There is a risk that the confidentiality of what you share amongst others in the program may be violated by others. To minimize this risk, all participants of the programs will be asked, by the program instructors, to respect this confidentiality. The principal researcher will be the only person with access to responses. The data will be de-identified by the participants putting only their initials and birth year on the pretest and posttest. The only master list will be kept in a locked file cabinet, in a locked office on Brigham Young University campus. The only identifying information on the master list will be the participants' initials and birth year. After all necessary information and

responses are gathered, analyzed, and reported, all questionnaires will be kept in a locked cabinet for use if secondary analysis needs to be done.

Compensation

There will be no compensation for participating in this research study.

Participation

Your participation as a subject of this study must be of your own volition and understanding that you are under no obligation to participate. You understand that you will not be penalized in any way, as a participant in these programs, for choosing not to participate in this study. You understand that you may withdraw from this study at anytime without any penalties to your participation or standing in the sun Valley Adaptive Sports Higher Ground Program and that you may request to have your input be completely or partially removed from the collected data of this study.

Questions about the Research

If you have any questions about this research study, you may contact Dr. Neil Lundberg, CTRS Department of Recreation Management and Youth Leadership, Brigham Young University, W425 Tanner Building, Provo, Utah 84602, telephone number: (801) 422-8914.

Questions about your Rights as Research Participants

If you have questions regarding your rights as a research participant, you may contact the BYU IRB Administrator at (801) 422-1461, A-285 ASB, Brigham Young University, Provo, UT 84602, irb@byu.edu.

Completing this online survey indicates your willingness to participate as a research subject. Please answer each question honestly and to the best of your ability.