The wars in Iraq (OIF) and Afghanistan (OEF) have created a new population of returning troops who have experienced both positive and negative outcomes from their war experience. The most common negative outcome reported is an increase in suicides every year since the start of the war (18 veterans, on average, commit suicide every day; AFP, 2010; Rieckhoff, 2009). Further, nearly 40% of veterans that served in OIF/OEF display symptoms of mental health disorders (Seal et al., 2009). The most commonly diagnosed mental health disorders in this population are posttraumatic stress disorder (PTSD) and depression (Tanielian & Jaycox, 2008). Symptoms of PTSD last for more than one month, significantly impair functioning, and are divided into three subgroups (i.e. re-experiencing of the traumatic experience, avoidance/emotional numbing, and hyperarousal; APA, 1994). Veterans with PTSD or depression are more likely to suffer from substance abuse, be homeless, to be unemployed, to get divorced, and to commit suicide (AFP, 2010; Rieckhoff, 2009; Tanielian & Jaycox, 2008). Also, veterans with PTSD were found to have more difficulty with relationships, especially family relationships (Johnson et al., 2007; MacDermid Wadsworth, 2010). In addition, only one fourth of these veterans with mental health disorders receive minimal care and half receive no care at all (Tanielian & Jaycox, 2008). However, veterans without mental health disorders, compared to the general population, are more likely to be employed, have a higher income, and have a higher level of education (Bureau of Labor Statistics, 2011).

Researchers have found evidence of positive life changes for veterans that stem from traumatic combat experiences (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, PTG “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). In other words, OIF/OEF veterans are likely to experience both PTSD symptoms and PTG from combat trauma. Two factors identified as helping to protect against PTSD symptoms are engagement in meaningful activities and feelings of competence (Feldner, Monson, & Friedman, 2007; Kleiber, Hutchinson, & Williams, 2002; Schaubroeck, Riolli, Peng, & Spain, 2011).

Veterans with PTSD may experience few areas of their lives where they can engage in meaningful activities and/or perceive themselves as competent, especially if they were discharged from the military due to their PTSD symptoms (Johnson, et al., 2007). Involvement in recreation activities can help to create feeling of competence when learning or relearning an activity. Increasing feelings of competence not only allows the participant to enjoy the activity, but the participant increases positive feelings towards other aspects of his/her life (Caldwell, 2005; Kleiber, et al., 2002). Veterans with PTSD could use learning/relearning a recreation activity to increase feelings of competence, in turn reducing symptoms of PTSD and increasing PTG. Few studies have examined the relationship between recreation involvement, perceived competence, and PTG among individuals with PTSD (Kleiber, et al., 2002). The purpose of this...
study was to examine the influence of participation in an adaptive sports program for veterans with PTSD on their perception of competence, symptoms of PTSD, and PTG.

Methods
Participants were recruited from all veterans attending the Sun Valley Adaptive Sports, Higher Ground (HG) program. HG is designed specifically to teach recreational activities in an environment that maximizes success for OIF/OEF veterans with symptoms of combat related PTSD, traumatic brain injury (TBI). Each program lasts five days and depending on the program attended, veterans participate in activities ranging from snowsports, fly-fishing, or watersports. Those veterans who participated in the research study consented to participate and completed the pretest online prior to beginning the program. Posttests were completed following participation in HG. Data were collected online over a 10-month period from January to October 2011.

The research questionnaire included: (a) the 17-item Posttraumatic Stress Disorder Checklist, Military Version (PCL-M; Forbes, Creamer, & Biddle, 2001), to measure PTSD as defined by the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV; APA, 1994); (b) the 21-item Posttraumatic Growth Inventory (PTGI), to measure growth across dimensions including relating to others, experiencing new possibilities, personal strength, spiritual change, and appreciation of life (Tedeschi & Calhoun, 1996); and (c) the four-item Perceived Competence Scale (PCS), to measure the level of perceived competence in sport participation (Williams & Deci, 1996). Sociodemographic data such as employment, family income, gender, military information such as rank, military branch, years served, and number of deployments, physical injury/disability, time lapse from their injury, age, and ethnicity was also collected.

The data was cleaned for any missing entries or outliers. Descriptive statistics were computed for the variables. The percentage of change between pre and posttest scores on each instrument was calculated. Six paired sample t-tests (PCL-M total, three PCL-M subscales, PTGI and PCS) were performed in order to examine significant differences between pre and posttest scores. All tests were performed at α level < .05.

Results
The sample consisted of 33 veterans, 10 female (30.3%) and 23 male (69.7%). Veterans’ ages ranged from 24-55, with a mean of 36.7 (SD = 8.6). The majority of participants were Caucasian (57.6%), 21.2% were Hispanic, and 15.2% were African-American. Eighty-five percent of the participants were not employed, while 15% were employed part/full-time. Annual household incomes ranged from less than $15,000 to over $100,000, with the median income ranging from $30,000 to $49,999. All branches of the military were represented, with the Army as the largest portion (72.2%). Number of years served ranged from 2-32, with an average of 12.7 years, and an average of 4 deployments. The most common combat related disabilities were PTSD (78.8%), TBI (63.6%), orthopedic impairments (36.4%), sleep and anxiety disorders (18.1%), cognitive setbacks and hearing impairments (18.2% each), and visual impairments (12.1%). The number of years since their initial injury occurred ranged from two to 23, with an average of 7.3 years.

The PCL-M established a total score for PTSD symptoms, as well as three subscales (re-experiencing, avoidance, and hyperarousal). For this sample, a significant decrease was found in the total scores ($t_{32} = 7.729, p < 0.001$), the re-experiencing subscale ($t_{32} = 5.361, p < 0.001$), the avoidance subscale ($t_{32} = 7.959, p < 0.001$), and the hyperarousal subscale ($t_{32} = 6.704, p < 0.001$). These findings represent a 21.02% decrease in total PTSD symptoms, a 17.4% decrease in symptoms of re-experiencing, a 29.26% decrease in symptoms of avoidance, and a 19% decrease in symptoms of hyperarousal. Findings also indicated a 7.2% increase in feelings of growth related to a traumatic experience; however, this was not a statistically significant increase.
(t_{32} = -1.805, p = 0.081). A significant increase was found between pre and posttest PCS scores
\((t_{32} = -2.349, p = 0.025)\), indicating a 9.25\% increase in perceived competence in sports.

**Discussion**

Previous research on veterans with PTSD, TBI, or have sustained polytrauma has mostly
focused on the negative outcomes of combat (Seal, et al., 2009), with some focus on the positive
outcomes (Solomon & Dekel, 2007). Researchers have also examined the positive influence of
recreation participation for individuals who experienced a traumatic event (PTG; Caldwell, 2005;
Kleiber, et al., 2002). The purpose of this study was to examine the influence of participation in
an adaptive sports program for veterans with PTSD on their feelings of competence, symptoms
of PTSD, and PTG.

After participating in a five-day adaptive sports program, these veterans with PTSD reported
a significant increase in perceived competence, a significant decrease in symptoms of PTSD, and
approached a significant increase in PTG. It is not surprising PTG scores only approached
significance from the pretest to the posttest, because PTG is a global variable that usually
changes over longer periods of time (Tedeschi, et al., 1998). It is very encouraging that a five
day program was found to have a 7.2\% increase in PTG for this population. Hopefully, if these
veterans with PTSD continue to participate in recreation activities and increase their feelings of
competence, they will continue to reduce PTSD symptoms and increase PTG.

This study provides support for the connection between increasing competence through
learning/relearning a recreation activity and decreasing PTSD symptoms and increasing PTG.
Recreation professionals should design recreation programs for veterans with PTSD specifically
to help build feelings of competence and in turn reduce PTSD symptoms and increase PTG. It is
important to remember that many veterans are highly trained and skilled individuals, regardless
of their service related injuries or disabilities. Merely participating in recreational activities may
not be enough of a stimulating experience to influence their perceptions of competence. Service
providers may want to consider designing programs that provide differing levels of skill
development related to the recreational activities, so that those veterans who wish to learn the
skills may do so, and can do so at a level that provides them with optimal challenge. Service
related aspects such as these may help increase feelings of competence and PTG for veterans as
they participate in and succeed at challenging recreational activities.

Although the findings from this study are very encouraging, limitations should be considered.
A comparison group was not utilized in this study and the sample size was small; therefore, the
changes could be due to other factors outside the participation in the HG program and results
should be interpreted cautiously. Future research would benefit from including a control group
for comparison purposes, as well as gathering data from more participants. Longitudinal data
collected over multiple time points is also recommended for future studies. Information
regarding the lasting effects of participation in the program on all aspects of PTSD
symptomology, PTG, and perceptions of competence, would greatly contribute to the overall
understanding of participation in adaptive sports for veterans. Positive long-term changes in
these areas stemming from recreational participation would highlight these services as
appropriate and effective for working with veterans, especially those with PTSD. With the
increasing number of veterans returning from combat, and the portion of those veterans who
have sustained combat related injuries, services such as these are high demand.

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Selected References


