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EVALUATION OF RELATIONSHIPS BETWEEN REPORTED RESILIENCE AND SOLDIER OUTCOMES, Report #1: Negative Outcomes (Suicide, Drug Use and Violent Crime)

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This document is the first of a series of reports evaluating the impact of the Army's Comprehensive Soldier Fitness (CSF) Program by examining relationships between reported resilience and various health and behavioral outcomes (both positive and negative) among Soldiers. The first set of de-identified Global Assessment Tool data made available for analysis included responses from Soldiers who completed suicide in 2010, Soldiers who tested positive for illicit drug use, and Soldiers who were charged with engaging in violent crimes. Our analyses suggest that Soldiers who completed suicide were less resilient than Soldiers who did not commit suicide; Soldiers who tested positive for illicit drug use were less resilient than Soldiers who did not test positive; and Soldiers who committed violent crimes were less resilient than those who did not commit violent crimes. The results of these analyses held when researchers controlled for potential demographic effects.

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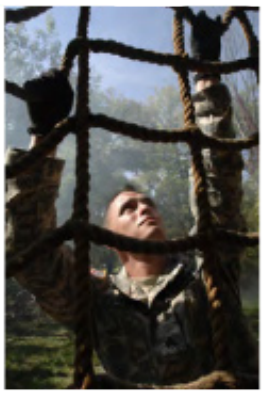
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Report #1: Negative Outcomes
(Suicide, Drug Use, and Violent Crimes)
February 2011






COMPREHENSIVE SOLDIER FITNESS
STRONG MINDS ★ STRONG BODIES

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EVALUATION OF RELATIONSHIPS BETWEEN REPORTED RESILIENCE AND SOLDIER OUTCOMES

Report #1: Negative Outcomes (Suicide, Drug Use and Violent Crime)

February 2011

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EVALUATION OF RELATIONSHIPS BETWEEN REPORTED RESILIENCE AND SOLDIER OUTCOMES

Report #1: Negative Outcomes – February 2011

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EXECUTIVE SUMMARY

This document is the first of a series of reports evaluating the impact of the Army's Comprehensive Soldier Fitness (CSF) Program by examining relationships between reported resilience and various health and behavioral outcomes (both positive and negative) among Soldiers. Resilience is measured by the Global Assessment Tool (GAT), a self-report inventory designed to provide confidential feedback to Soldiers about their personal level of resilience along four dimensions (Emotional, Family, Social, and Spiritual). The first set of de-identified GAT data made available for analysis included responses from Soldiers who completed suicide in 2010, Soldiers who tested positive for illicit drug use, and Soldiers who were charged with engaging in violent crimes. The evaluation team was asked to compare these GAT scores with the larger database of all Soldiers completing the GAT in 2010 to determine if there was a difference in reported resiliency among Soldiers with or without these negative behavioral outcomes.

Our analyses suggest that Soldiers who completed suicide were less resilient than Soldiers who did not commit suicide; Soldiers who tested positive for illicit drug use were less resilient than Soldiers who did not test positive; and Soldiers who committed violent crimes were less resilient than those who did not commit violent crimes. The results of these analyses held when researchers controlled for potential demographic effects. Subscales contained within the GAT were compared for all groups to provide more information about the relationships between psychological fitness and the behaviors of interest. The report in no way implies that the behavioral outcomes were caused by a lack of resilience. It is likely that resilience is one of many factors related to the negative outcomes examined in this initial evaluation.

The analyses in this report are informed by a limited series of data. For example, the analysis team did not know if Soldiers who completed suicide, used illicit drugs or committed violent crimes were already diagnosed with a behavioral health problem, were in therapy, or were taking prescription medication designed to address those problems. Future access to information beyond the GAT – such as medical, deployment, and performance data – will provide a deeper understanding of resilience and its relationship to Soldier fitness. It is also suggested that temporal relationships between resilience scores (GAT data) and behavioral outcomes be explored more fully in future analyses.

1. INTRODUCTION

The aim of the Comprehensive Soldier Fitness program (CSF) is to assist the Army in developing resilient Soldiers. The recent Health Promotion, Risk Reduction, and Suicide Prevention Report noted that the CSF program is "leading [the Army's] effort in changing the way we address cumulative stress on the force" (Department of the Army, 2010, p. iii). The next step in development of the Army's efforts to strengthen its force is to understand more about how dimensions of resilience serve to protect Soldiers from experiencing negative outcomes (e.g., suicide) and how it is associated with positive outcomes (e.g., promotion). This report represents a small part of a much larger program evaluation to examine the relationship between resilience and Soldier behavioral outcomes. Specifically, the evaluation will examine the extent to which the Global Assessment Tool (GAT) measures resilience and how the GAT scores are related to Soldier outcomes and behaviors of interest.

In this first report, we explore the relationship between GAT responses and three negative behavioral outcomes: completed suicide, drug use, and violent criminal offenses. Subsequent reports will document the relationship between the GAT and other Soldier outcomes and behaviors. This report consists of a brief introduction followed by an overview of the evaluation questions addressed, presentations of the results, and a brief conclusion. Highlights of each section are bracketed as "Key Takeaways" to capture the major points and insights for the reader. Appendices at the end of this report provide more in-depth information and additional statistical tables. A brief overview of the GAT is offered in the introduction to give the reader more information about the tool and what it measures before results of the first set of analyses are presented.

Point of Entry: The Global Assessment Tool (GAT) and the Soldier Fitness Tracker (SFT)

The GAT is a 105 question survey administered electronically to all Soldiers in the Army annually. Chris Peterson, Ph.D. and Nansook Park, Ph.D. from the University of Michigan and COL Carl Castro, Ph.D. from the Army Medical Department's Medical Research and Material Command (AMEDD MRMC) developed the GAT. Its purpose is to serve as a *self-awareness tool* for Soldiers by providing a snapshot of their psychological health along four dimensions – Emotional, Family, Social, and Spiritual fitness.

Soldiers completed the GAT over 900,000 times in FY10, a rate of one GAT completion every 35 seconds for an entire year. Because GAT data are linked to other data

sources, the Soldier Fitness Tracker (SFT) – the informational technology platform and database developed by CSF – currently tracks over 600 million cells of data. This number will more than double next year due to Soldiers retaking the GAT, new Soldiers completing the GAT for the first time, and integration of additional data sources into the SFT architecture.

Confidentiality and Data Security

One of the most important features of the GAT is that the scores and associated data remain confidential. A GAT score is only shared with the Soldier who completes the survey. Individual or unit GAT scores are not provided to anyone else (in accordance with HQDA policy this includes unit leadership, the Chaplaincy, investigators, family members and healthcare providers). To drive this point home, CSF provides clear guidance in Fragmentary Order 2 to the base CSF Execution Order: "The GAT and GAT feedback cannot be released to commands; the GAT is not designed to serve as a command surveillance tool, so CSF will not provide this capability to commands; Soldiers cannot be compelled to provide their GAT scores to anyone, but they may voluntarily do so if they wish; the Chief of Staff of the Army (CSA) is the sole release authority for an individual Soldier's GAT scores."

The GAT was never intended to be used as a selection or screening tool. In fact, the outer instruction page of the GAT states "The GAT will NOT be used as a selection tool for promotion or educational opportunities." The instruction page makes no reference to use as a medical screening tool, though both CSF leadership and scientific staff have repeatedly stated publically that the GAT will not be used as a medical screen.

The CSF's information technology division takes data security very seriously. Policies and procedures, approved by the Director of CSF and in accordance with AR25-2 (Information Assurance), are in place to ensure that data are properly secured and that confidentiality is always maintained. Regarding the current report and any future data analysis initiatives, the data analysis team is only able to examine de-identified archival data. Stated another way, CSF policies and procedures direct the database managers to serve as a firewall between the personally identifiable information (PII) held in the "live" database and the analysis team – the database managers are not authorized to query for PII for anyone other than at the expressed direction of the CSA. Currently, the database managers address data requests by manually querying the SFT for required data and then removing any PII. Once complete, they assign a confidential code to each person in the query and forward the file to the analysis team.

Content of the GAT

Approximately 90% of the questions included on the GAT were taken or adapted from validated measures of psychological constructs previously published in peer-reviewed scientific journals; the remaining 10% of the questions were authored by the GAT's developers. (See Appendix A for a list of the survey instruments used to create the GAT.) Soldiers are asked questions that probe their personal perceptions and self-

report of behaviors related to Emotional, Familial, Social, and Spiritual fitness. Questions generally fall into one of the following categories:

- Strength of family relationships
- Perception of family support for serving in the Army
- Perception of how well the Army provides for families
- Trust in unit, leadership and fellow Soldiers
- Strength of friendships
- An inventory of personal strengths
- Spiritual fitness (not religion)
- Personal optimism
- Work engagement
- Depression
- Catastrophic thinking
- Positive and negative coping strategies and behaviors
- Positive and negative affectivity (positive and negative emotions)

GAT Feedback

Soldiers receive feedback via the SFT once they complete the GAT (see Appendix B). Specifically, they receive the following in a tabbed format:

GAT Score: The SFT provides scores that are depicted graphically via bar charts, with one bar for each of the four dimensions (Emotional, Familial, Social, and Spiritual). Colors are assigned to each bar based on how well the Soldier scored; determined by comparing the Soldier's dimensional mean score to the dimensional mean score of all other GAT takers (i.e., a normative assessment). The bar is colored green if the Soldier's score falls above the 50% range, amber if it falls in the 26%-50% range and red if it falls in the 1%-25% range.

Broad Narrative: The SFT provides Soldiers with a broad narrative that explains the color coding scheme for the bar charts, describes how everyone has certain strengths and weaknesses, and makes general recommendations about how to interpret the feedback. A hyperlink and phone number is provided at the bottom of the feedback for anyone needing to speak to a counselor.

Tailored Narrative: The SFT provides Soldiers with a tailored narrative based on how they score on the GAT, with components broken into the Emotional, Family, Social, and Spiritual fitness dimensions. The narrative provides general advice on how to sustain and develop strengths while improving weaknesses and reminds Soldiers to keep the feedback in perspective. Similar to the broad narrative, SFT provides all Soldiers who "score red" on any dimension with a hyperlink and phone number should they decide to speak with a counselor.

Comparison Dashboard: Finally, the SFT provides Soldiers with an opportunity to see how they compare to other Soldiers with similar demographics. They are allowed to compare their scores to others who match them along gender, component status, rank,

marital status, civilian education level, age, MOS and deployment history. Soldiers may only make a comparison if there are at least 500 other Soldiers in the comparison group; this was done for reliability of the comparison and to eliminate the possibility of the Soldier comparing him- or herself to very small populations. Feedback is depicted with two bar charts per dimension – one for the Soldier and one for the comparison group. Soldiers are also shown a percentage of how much higher or lower their scores are than the comparison group along each dimension. Soldiers are not currently able to cross-tabulate (e.g., gender x rank x MOS x age), though this capability may be developed in the future.

Quality of GAT Data

Completing the GAT is an annual requirement for all Soldiers. Some critics of this annual requirement have questioned the quality of the GAT data by stating that Soldiers are too busy, are surveyed too often and that Soldiers generally do not trust surveys. To ensure the quality of the full set of 2010 GAT data, the analysis team performed a "cleaning" procedure prior to analysis. Specifically, the team tested for invariant data (identical response pattern regardless of question, e.g., 1, 1, 1, 1, 1), which resulted in a base rate of approximately 7%. Based on this analysis, approximately 93% of Soldiers who completed the GAT in 2010 provided quality data.

What Does the GAT Measure?

The GAT is designed to measure Soldier resilience, broadly conceptualized. Within the broader framework of resilience, the Army is interested in four psychological components of Soldier Fitness: Emotional Fitness, Family Fitness, Social Fitness, and Spiritual Fitness. The GAT measures each of these four dimensions of fitness separately, and then aggregates them for an overall Soldier Fitness score. The measurement approach and a description of the scales used to develop each dimension of fitness are provided below.

Emotional Fitness

Emotional Fitness is measured using an average of the mean scores on nine scales to arrive at an overall Emotional Fitness score.

> *Adaptability.* Three items, based on a measure of flexibility developed by Professors Park and Peterson, were used to assess adaptability. Respondents were asked to rate how well statements describe them using a five point scale. For example, "I am good at changing myself to adjust to changes in my life."
>
> *Bad Coping.* Three bad coping items were adapted from previous research (Peterson, et al., 2001). An example item was "I usually keep my emotions to myself." These items were also on a five point scale and were reverse scored for the analyses presented in this report.

Good Coping. Five good coping items were adapted from previous research (Peterson, et al., 2001). An example item was “For things I cannot change, I accept them and move on.”

Catastrophizing. Seven items were used to assess catastrophizing in the GAT. These items measured both prior flexibility (“I am good at changing myself to adjust to changes in my life”) and a hopeless explanatory style (“When bad things happen to me, I expect more bad things to happen”). Respondents indicated the degree to which the statements describe them on a 1 (not like me at all) to 5 (very much like me) response scale. These items were reverse scored for the analyses presented in this report.

Character. Character was assessed with the 24-item Brief Strengths Test (Peterson, 2007). Respondents indicated on a scale of 0 (never) to 10 (always) how often they showed or used several qualities in actual situations during the past four weeks. Example qualities included teamwork and self-control.

Depression. Ten items based on the Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2001) were used to assess depression. Respondents were asked how often in the past four weeks they were bothered by any of the problems listed. Examples of the problems include “Little interest or pleasure in doing things” and “Feeling down, depressed or hopeless.” A five point scale (from “not at all” to “every day”) was reverse scored for the analyses presented in this report.

Optimism. Optimism was assessed using 4 items from the Life Orientation Test (Scheier & Carver, 1985). Respondents were asked to denote on a five point anchored agree/disagree scale how the items apply to them. For example: “In uncertain times, I usually expect the best.”

Positive Affect and Negative Affect. The Positive and Negative Affect Scale (PANAS) was used to measure typical emotions. The PANAS was developed and validated by Watson, Clark, and Tellegen (1988) to measure two fairly orthogonal dimensions – positive affect and negative affect. Respondents were asked to rate how often they have experienced specific emotions such as “joyful” or “sad” over the course of the last four weeks on a five point scale anchored with “never, hardly ever, some of the time, often and most of the time.” The negative affect items were reverse scored for the analyses presented in this report.

Family Fitness

Family Fitness is assessed with the Family Satisfaction and Family Support scales described below. The mean scores of these two scales were averaged for an overall Family Fitness score.

Family Satisfaction. Two items were created for the GAT to assess overall family satisfaction. Those items were "How satisfied are you with your marriage/relationship?" and "How satisfied are you with your family?" Respondents were asked to indicate satisfaction level from 1 (not at all satisfied) to 5 (extremely satisfied) or indicate that these items were not applicable to them.

Family Support. Three questions from the Military Family Fitness Scale were used to assess the degree to which respondents believed their family supported their career in the military and that the Army supported their family. Respondents were asked how strongly they agree or disagree with each statement using an anchored five point scale with a "not applicable" option. An example item was "The Army meets my family's needs."

Social Fitness

Four scales were used to measure Social Fitness. An average of mean scores was used to calculate an overall social fitness score.

Engagement. Engagement was measured using items from the "Work as a Calling" scale (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997) and the "Orientations to Happiness" scale (Peterson, Park, & Seligman, 2005). Respondents indicated the degree to which the statements were representative of them on a scale of 1 (not like me at all) to 5 (very much like me). An example item was "I am committed to my job."

Friendship. Four items relevant to friendship were created for the GAT. Three questions were Yes/No dichotomous responses to questions such as "I have a best friend." The fourth question asked, "How many people are there who you can always count on if you have serious problems?" Response choices on a five point scale ranged from none to 4 or more.

Loneliness. Three items from the UCLA Loneliness scale (Russell, Peplau, & Cutrona, 1980) were used in the GAT. Respondents indicated how often they experienced feelings of loneliness on a scale of 1 (never) to 5 (most of the time). An example item of this scale was "How often do you feel left out?" These items were reverse scored for the analyses presented in this report.

Organizational Trust. Organizational trust was assessed using 5 items adapted from multiple measures of organizational trust (Mayer, Davis, & Schoorman, 1995; Mayer & Davis, 1999; Sweeney, Thompson, & Blanton, 2009). Respondents were asked to indicate how much they agreed with a statement using a 1 (strongly disagree) to 5 (strongly agree) response scale. An example item was "Overall, I trust my immediate supervisor."

Spiritual Fitness

Spiritual strength was measured using 5 items from the Brief Multidimensional Measure of Religiousness/Spirituality (Fetzer Institute, 1999). Respondents were asked to indicate the way they live their life on a scale from 1 (Not like me at all) to 5 (Very much like me). These items included “I am a spiritual person;” “My life has a lasting meaning;” “I believe that in some way my life is closely connected to all humanity and all the world;” “The job I am doing in the military has lasting meaning;” and “I believe there is a purpose for my life.”

Key Takeaways

- The GAT is a confidential self-awareness tool for a Soldier’s self-development.
- The GAT is a measure of the presence of strengths and health assets in Soldiers.
- Soldiers completed the GAT more than 900,000 times during FY10.
- The GAT was never intended to be used as a selection or medical screening tool.
- 90% of the questions on the GAT have already been validated via previous scientific research.
- Personal, confidential feedback is provided to Soldiers four ways – bar charts, a broad narrative, a tailored narrative, and a score comparison dashboard.
- Approximately 93% of Soldiers who complete the GAT provide quality data.



2. EVALUATION QUESTIONS AND ANALYSES

Preliminary analysis of GAT data began in April 2010 in preparation for a CSF Subject Matter Expert (SME) meeting held in Arlington, VA. The intent was to show the SMEs the distribution of GAT scores of certain small populations, some with positive behavioral outcomes (e.g., officers selected for command), and some with negative behavioral outcomes (e.g., suicides, positive urinalyses for illicit drugs, violent crimes). The initial analyses were not overly complex as they were to serve as illustrations of behavioral outcomes that tend to cluster above or below the 50th percentile using overall composite GAT scores.

The preliminary analyses using only the composite GAT scores showed the negative behavioral outcomes clustered at the lower ends of the distribution, suggesting that negative outcomes are related to lower GAT scores. Regarding suicides, what we learned from these preliminary analyses was much starker. Whether taken as a whole or examined by GAT dimension, suicides tended to cluster in the bottom 10th percentile of all GAT scores, even after filtering for invariant responses. This discovery suggested a need for additional, more deliberate analyses to establish more clearly how resilience is related to Soldier outcomes and behaviors, which led to this more comprehensive evaluation of the GAT data.

The first set of data made available to the evaluation team included de-identified GAT responses for Soldiers who completed suicide in 2010, tested positive for drug use in urinalysis tests or who were charged with a violent crime. The evaluation question in each case was whether or not there was a statistical relationship between the GAT and the outcome of interest. The data were analyzed using the four dimensions of fitness and the subscales of each fitness dimension rather than the composite GAT score. The purpose of this approach was to add more in-depth understanding about the relationship of each resilience element to the outcome of interest.

The analysis team initially “cleaned” the data as described in the previous section on quality of the GAT data (screening out invariant responses). To ensure that responses to the GAT were intentional and meaningful, we also screened out cases where participants entered the same response to all questions for the PANAS scale. The PANAS contains two subscales designed to be largely orthogonal to one another with a balanced scoring key. Consequently, giving the same response to every PANAS item would be extremely improbable. It should also be noted that because the PANAS was the last component of the GAT, it was the most likely to have responses of test fatigue. The data that were left formed the primary GAT database used for this analysis.

The database managers made separate databases available to the analysis team with the information related to completed suicides, positive urinalysis tests and violent crimes. These databases were linked to the GAT information by a de-identified user ID

field. Because some Soldiers had two GAT scores in 2010, the decision was made to merge the negative outcome databases with the primary GAT database using the first GAT score for each Soldier respondent. Future analyses may look closer at outcomes for Soldiers longitudinally, but the primary interest in this phase of the evaluation was to determine the presence or absence of a relationship between GAT scores and negative outcomes. Missing data in the GAT were handled by excluding incomplete responses from the analysis (list wise deletion.)

De-identified GAT responses for all Soldiers who responded to the GAT in 2010 were made available to the analysis team for comparision to the scores of Soldiers included in the three databases with negative outcomes. This larger dataset is labeled as the "control" group in all subsequent figures that illustrate results in this report.

Analysis 1

Are GAT scores related to completed suicide among Soldiers?

The recently released Army Health Promotion, Risk Reduction, Suicide Prevention Report (Department of the Army, 2010) provides an exhaustive review of available suicide research and suicide within the Army. Generally there is more research reported in the literature related to risk rather than resilience. Although teasing out resilience factors and their relationship to suicide is difficult, Pietrzak and colleagues (2009) related decreased perceptions of resilience and social support to increased suicidal ideation with Veterans and called for further exploration of protective factors and their role in mediating suicide risk with military populations. In another study with Veterans from the Iraq war (Roy, Sarchiapone, & Carli, 2007), suicide attempters had significantly lower overall resilience scores than non-attempters as measured by the Connor-Davidson Resilience Scale (Connor & Davidson, 2003). One recent study by Johnson and colleagues (2010) pointed to positive self appraisal as a buffer for suicide for young adults. The authors contend that positive self appraisal may have an impact on how an individual assesses their personal situation and thus can mediate or weaken the effects of stress. Based on this literature, and what we know about suicide more generally, we expected Soldier fitness to be negatively related to completed suicides. Stated another way, we expected Soldiers who have completed suicide to have lower resilience scores on each of the four dimensions of the GAT.

Method

The lead author obtained the information for this analysis by contacting the Program Manager for the Army Suicide Prevention Program in October 2010 and requesting available data on completed suicides during FY10. The request was for a file that contained social security numbers and other demographic information so the database managers could later identify who in the SFT database completed suicide. Of the 282 records turned over to the team, 92 had GAT records in the SFT database. All data were handled as previously described – identifiers were removed prior to data integration and subsequent analysis. We were unable to match one Soldier to his or her

GAT score, leaving us with 91 usable records. Of the 91 suicide cases, 6 were using an invariant response pattern on the PANAS, resulting in 85 reliable records for use in this and subsequent analyses of completed suicides. These 85 individuals were compared against approximately 791,000 Soldiers who completed the GAT but did not complete suicide.

After screening for invariant responses, the evaluation team employed independent samples t-tests to determine if there were statistically significant differences between the suicide and living Soldier groups on each of the four dimensions of Soldier fitness. For a more detailed understanding of any potential differences between the groups, we also examined mean differences on each of the 16 subscales used to measure Soldier fitness. Further analyses were conducted to control for possible differences in scores that might be an artifact of demographic differences between the two samples.

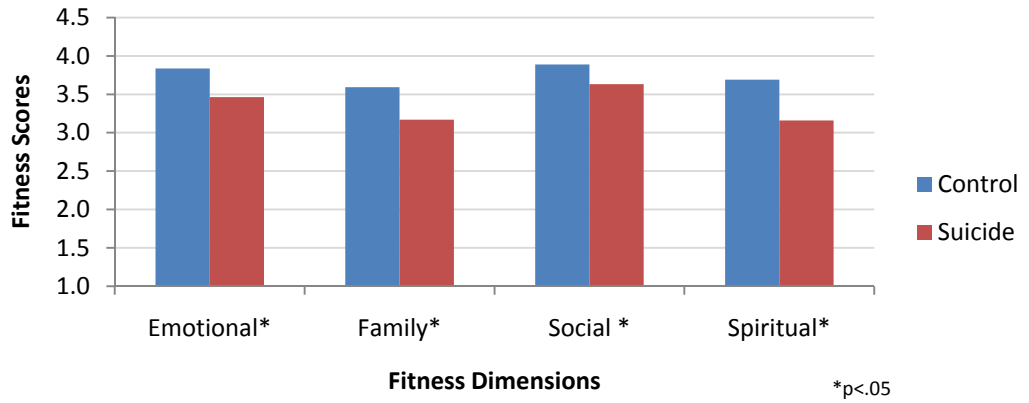
The scales in the GAT are automatically scored to reflect higher levels of resiliency. Therefore, the scales for "negative" constructs (loneliness, depression, catastrophizing, bad coping, and negative affect) are scored so that higher scores are related to "better" responses to those questions. For example, a higher mean score on the loneliness scale is related to being less lonely. We must also note that some respondents indicated that family-related items were not relevant to them. Consequently, analyses of the family fitness variables had a lower overall sample size.

Results

Four Dimensions of Fitness. The first level of inquiry was to compare the GAT scores for the living Soldiers with Soldiers who completed suicide across the four dimensions of psychological fitness. The most notable limitation of this inquiry was that we did not know if any of the living Soldiers had a history of suicide ideation or attempts. Future investigations may benefit from inclusion of these variables.

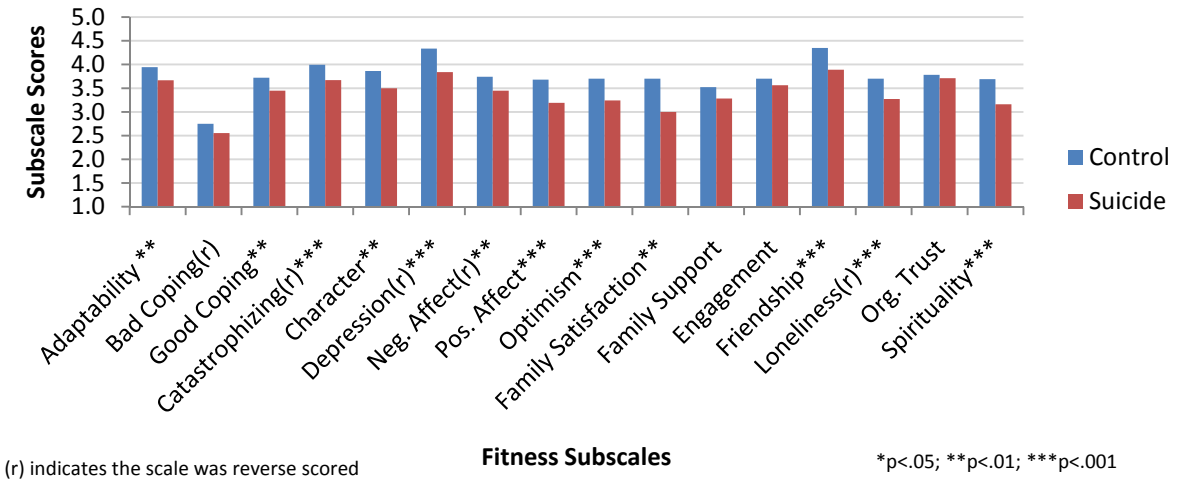
The results show that resilience levels, as expected, were significantly higher on each of the four dimensions of psychological fitness among the living Soldiers (Figure 1). In particular, living Soldiers had a mean score of 3.84 on Emotional Fitness, while Soldiers who completed suicide had a mean score of 3.46. The living Soldiers scored significantly higher on Family Fitness (3.59 versus 3.17); Social Fitness (3.89 versus 3.63); and Spiritual Fitness (3.69 versus 3.16). The two groups differed on a number of demographic variables. Specifically, the suicide group was more likely to be male and to have lower average rank. To account for any potential differences due to the demographic characteristics of the two samples, the analyses above were conducted using Analysis of Variance (ANOVA) techniques. The results showed that the significant differences between the living Soldier and suicide groups remained even after controlling for demographic differences. The results of these analyses are available in Appendix C.

Figure 1. Fitness Comparison Between Soldiers who Completed Suicide and Soldiers who did not Complete Suicide (Living Soldiers)



Scale-level Analysis. We examined mean differences between the two groups on each of the 16 scales that are used to measure psychological fitness. Not surprisingly, the results were largely consistent with the findings of the previous analysis (Figure 2). However, there were a number of minor differences that deserve mention. Among the scales used to measure Emotional Fitness, bad coping was not significant, suggesting that the differences between the living and suicide groups on this particular variable were not as great as on other aspects of Emotional Fitness. Although there was a significant difference between the two samples on the Family Fitness dimension, there was no significant difference on the family support scale. This finding suggests that both groups perceived similar levels of familial support from the Army. Finally, two of the four scales used to measure Social Fitness (engagement and organizational trust) did not differ between the two groups.

Figure 2. Scale Comparison Between Soldiers who Completed suicide and Soldiers who did not Complete Suicide (Living Soldiers)



Analysis 2

Are GAT scores related to drug use among Soldiers?

In the academic literature, drug abuse has been negatively associated with mental health. For example, drug use has been linked to general coping (Senbanjo, Wolff, Marshall, & Strang, 2009), coping with family problems (Wallace & Fisher, 2007; Willis & Yaeger, 2003) and perceived stress levels (Sinha, 2001). Low levels of social and familial support have also been positively related to the likelihood of drug abuse and relapse (Ellis, Bernichon, Yu, Roberts, & Herrell, 2004). Substance use disorders have also been identified as both a predictor and outcome of major depressive disorder (Leventhal, Lewinsohn, & Petit, 2008). Among veterans, post traumatic stress disorder (PTSD) and exposure to trauma are believed to interact with substance abuse, such that veterans with PTSD or who have been exposed to trauma reported higher levels of depression and anxiety before and after relapse (Norman, Tate, Anderson, & Brown, 2007). Research also suggests that there may be an increased risk of suicide and self-harm among people with co-occurring mental and substance abuse disorders, (Rush & Koegl, 2008).

On balance, this body of research lead us to expect that Soldiers who test positive for illicit drug use would exhibit lower levels of psychological fitness. However, because the research is fairly ambiguous regarding the causal links between substance abuse and the various aspects of psychological fitness, future evaluations could examine the extent to which illicit drug use is related to Soldier fitness *after* Soldiers have taken the GAT and been exposed to the three types of feedback provided by the GAT.

Method

The de-identified data file received by the team for this analysis contained information for 6,935 Soldiers who tested positive for an illicit drug in FY 10. We were able to match 3,513 individuals with their first GAT score. After using the screening procedures, 3,069 Soldiers provided usable responses. This group of Soldiers was compared to approximately 788,000 Soldiers who did not test positive for drug use. Test variables were reverse scored in the same way as in Analysis 1.

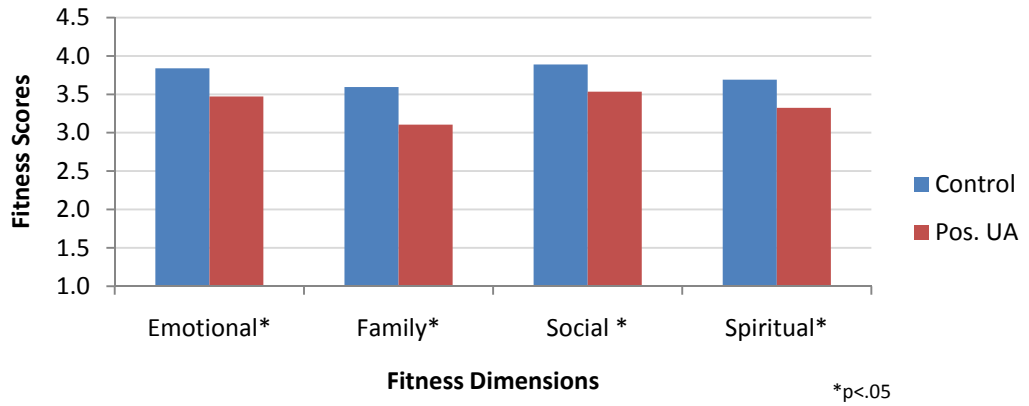
The first step of the analysis was to use t-tests to compare the GAT responses of Soldiers with positive UAs with Soldiers who did not test positive. We began our analysis by looking at the four dimensions of Soldier fitness. Next, we completed the same analyses controlling for demographics. We then examined differences between the groups on the 16 subscales used to measure Soldier fitness.

Results

Four Dimensions of Fitness. The results of the first step of the analysis are presented in Figure 3. As the figure shows, the Soldiers who did not test positive for illicit drug use scored significantly higher on each of the four GAT dimensions of fitness than the positive UA sample: 3.84 versus 3.47 on Emotional Fitness; 3.60 versus 3.11 on Family

Fitness; 3.89 versus 3.53 on Social Fitness; and 3.69 versus 3.32 on Spiritual Fitness. We found demographic differences between the two groups, with Soldiers in the positive UA group more likely to be male, unmarried, on active duty, and with a lower mean rank. Controlling for these demographic differences, the mean differences on each of the four fitness dimensions held; these analyses are presented in Appendix C.

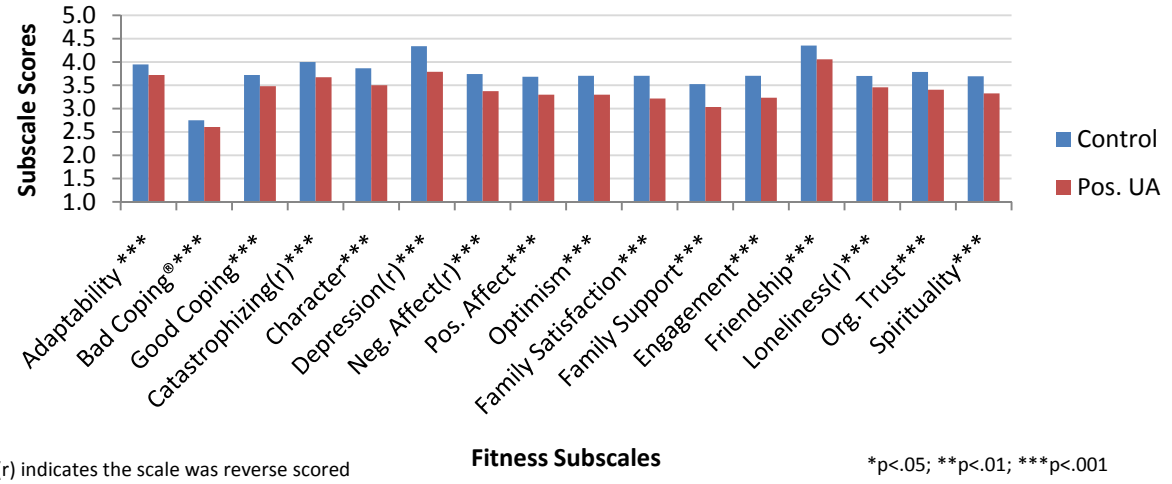
Figure 3. Fitness Comparison Between Soldiers with a Pos. UA and Soldiers without a Pos. UA



*p<.05

Scale-level Analysis. We compared mean scores on each of the 16 subscales of Soldier fitness to more clearly see any differences between the positive UA group and the larger group who did not test positive. As Figure 4 shows, the results support the findings of the initial analysis. Specifically, we found highly significant differences on each of the 16 scales that comprise the GAT.

Figure 4. Scale Comparison Between Soldiers with a Pos. UA and Soldiers without a Pos. UA



(r) indicates the scale was reverse scored

*p<.05; **p<.01; ***p<.001

Analysis 3

Are GAT scores related to violent criminal offenses among Soldiers?

Research has linked dimensions of resilience and the likelihood of committing violent criminal offenses. For example, in developing a theory of criminal behavior, Colvin, Cullen, and Vander Ven (2002) noted that social support has a tendency to prevent crime. Consistent with this position, loneliness has been associated as a common trait of sexual offenders (Bumby, 1997; Hudson & Ward, 1997). According to Douzenis, Ferentinos, and Lykouras (2005), depressed patients, though generally less often involved in criminal acts, are likely to perpetrate violent acts when criminality does occur. Moreover, evidence suggests that depression is a factor in extended suicide in which the victim takes the life of another before taking their own (Harrer & Kolfer-Westergren, 1986; Meszaros & Fischer-Danzinger, 2000). Given this evidence, we expected to see a negative relationship between the presence of a violent criminal offense and Soldier resilience as measured by the GAT.

Methods

To answer this question, the authors obtained information for 160 individuals who completed the GAT and later committed a violent criminal offense (murder, rape, forcible sodomy, aggravated sexual assault, aggravated assault or armed robbery). We again matched the data with Soldiers' initial completion of the GAT. After screening for invariant responses, 132 Soldiers provided usable responses. These 132 Soldiers were compared against approximately 791,000 Soldiers who did not commit violent criminal offenses.

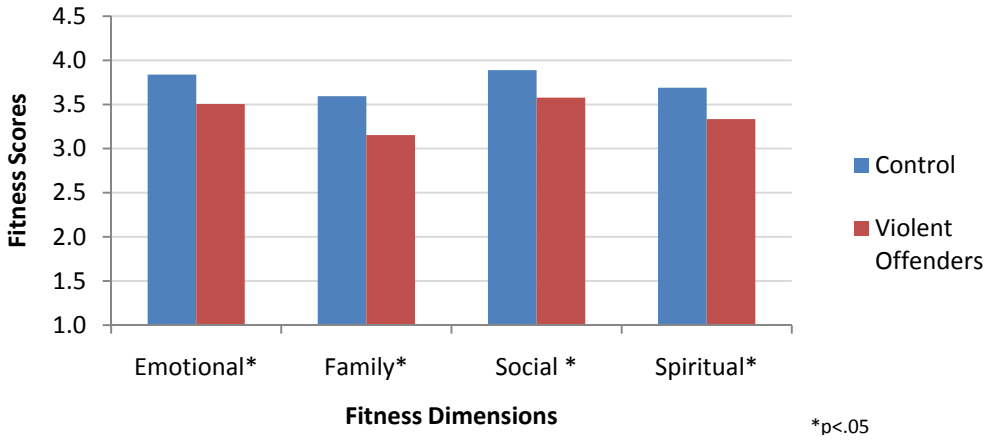
The same analytic approach was applied as in Analyses 1 and 2, where we first analyzed differences between the two groups on the four dimensions of fitness, controlled for any potential demographic differences, and then compared the two groups on the 16 scales that comprise the GAT.

Results

Four Dimensions of Fitness. As Figure 5 shows, there were significant differences on each of the four fitness dimensions between Soldiers who committed violent criminal offenses and those who did not. In particular, Soldiers who did not commit violent criminal offenses scored higher on Emotional Fitness (3.84 versus 3.51); Family Fitness (3.59 versus 3.15); Social Fitness (3.89 versus 3.58); and Spiritual Fitness (3.69 versus 3.33). Once again, we found significant demographic differences between the violent criminal offense group and population who had not committed a violent criminal offense. The violent criminal offense group was more likely to be male, on active duty, less likely to be married and tended to have lower military rank. These differences led us to control for demographic differences between the two samples. The significant differences on three of the four fitness dimensions held even after controlling for demographic

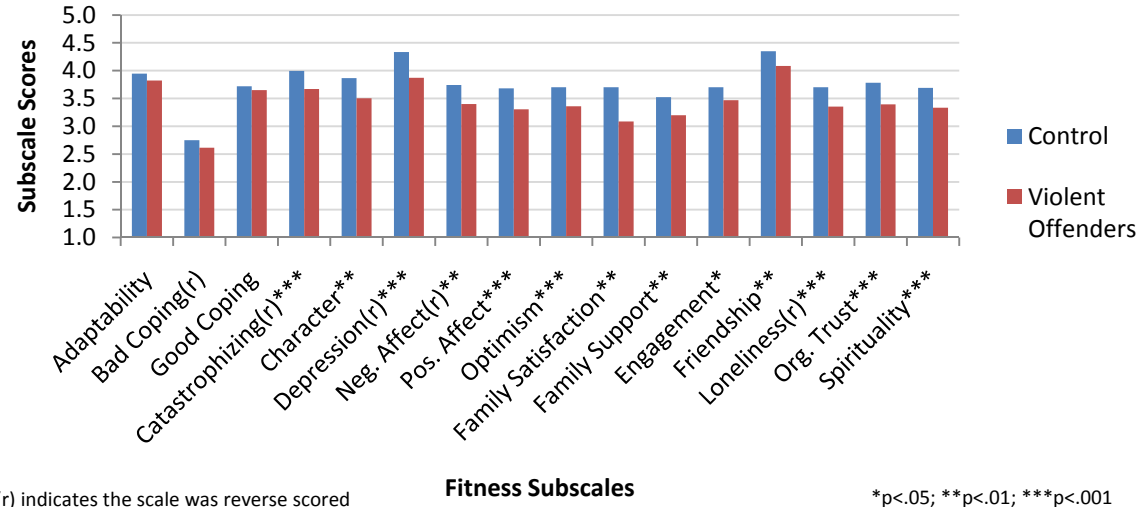
variables (Emotional, Family, and Social). However, the significance of the difference between the two groups on the Spiritual dimension was reduced to $p<.05$, rather than $p<.001$ (the results of this analysis are presented in Appendix C).

Figure 5. Fitness Comparison Between Soldiers who Committed Violent Criminal Offenses and Soldiers who did not Commit a Violent Criminal Offense



Scale-level Analysis. We again followed up our initial analysis by examining scores on individual scales. The results of the analysis again yielded significant differences on many of the scales used to measure Soldier fitness. However, the two groups showed relatively similar responses on adaptability and good and bad coping (Figure 6).

Figure 6. Scale Comparison Between Soldiers who Committed Violent Criminal Offenses and Soldiers who did not Commit Violent Criminal Offenses



Discussion

The results of these analyses provide evidence that Soldiers who complete suicide, Soldiers who test positive for illicit drug use and Soldiers who commit violent crimes are significantly less resilient on each of the four dimensions of psychological fitness than their counterparts who do not engage in such behaviors. We believe the GAT effectively measures the differences in resilience among Soldiers because each of the findings presented here are in line with our general expectations regarding Soldier fitness and negative behavioral outcomes.

Although the findings are in line with our general expectations regarding psychological fitness and negative outcomes, there are a number of more nuanced relationships between the GAT subscales and behaviors that deserve mention. First, although there were significant differences on each of the four fitness dimensions between Soldiers who completed suicide and those who did not**,** we found no differences between the two groups in terms of family support. Additionally, there was no significant difference between the two groups on engagement and organizational trust, suggesting that Soldiers who completed suicide were fairly similar to the living group by way of their work engagement and their attitudes toward their superiors. Similarly, although we found significant differences between Soldiers who committed violent criminal offenses and those who did not on each of the four fitness dimensions, we also observed a number of similarities between these two groups when we examined the differences at the subscale level. In particular, the violent criminal offense group was similar to the larger population (who had not committed a violent criminal offense) in terms of their ability to cope with stress and in their adaptability. Together, these findings detract from our ability to make overly general statements regarding the four dimensions of fitness and behaviors of interest. Thus, the findings suggest that we must be careful to fully explore the relationships between aspects of psychological fitness and behaviors if we are to fully understand them.

Second, the analyses related to positive urinalyses show stark psychological differences between Soldiers who have tested positive for illicit drug use and those who have not on each of the four dimensions of fitness and on each of the sixteen subscales of fitness. This finding is notable in that it suggests that Soldiers who have tested positive for drugs are more distinct psychologically from the Soldier population that did not test positive for drugs than are the suicide population from the non-suicide population, or the violent criminal offense population from the population who had not committed a violent offense. Table 1 below summarizes these findings across each of the three groups of interest.

Table 1. Summary of Significant Differences in Psychological Fitness Across Each Behavior of Interest

	Suicide vs. Living	Positive UA vs. Non-Positive UA	Violent Criminal Offense vs. No Violent Criminal Offense
Emotional	x	x	x
Adaptability	x	x	
Bad Coping		x	
Good Coping	x	x	
Catastrophizing	x	x	x
Character	x	x	x
Depression	x	x	x
Neg. Affect	x	x	x
Pos. Affect	x	x	x
Optimism	x	x	x
Family	x	x	x
Family Satisfaction	x	x	x
Family Support		x	x
Social	x	x	x
Engagement		x	x
Friendship	x	x	x
Loneliness	x	x	x
Org. Trust		x	x
Spiritual	x	x	x

x = significant difference on scale/dimension

The analysis team was interested in knowing how many Soldiers were represented in multiple categories of behavior – among Soldiers who complete suicide, Soldiers with positive urinalyses, and Soldiers who commit violent offenses. Although not presented here, a crosstab analysis revealed that only two Soldiers tested positive for drugs and committed a violent offense; one Soldier committed a violent offense and completed suicide; and no Soldiers tested positive for drugs and completed suicide.

Key Takeaways

- The results of these analyses are consistent with expectations that Soldiers who complet suicide, Soldiers who test positive for illicit drug use, and Soldiers who commit violent crimes, are less resilient than their counterparts who do not engage in such behaviors.
- This evidence suggests that the GAT is a useful tool to examine statistical relationships between resilience and outcomes of interest.
- It is beneficial to examine resilience at the subscale level so that a more nuanced understanding of the relationship between the GAT and behaviors might be obtained.
- There are very large, significant differences between drug users and non-drug users.
- Although Soldiers who complete suicide are distinct from Soldiers who do not complete suicide, there are a number of similarities between the two groups when resilience is examined at the scale level.
    - The two groups are statistically similar in terms of bad coping, family support, engagement, and organizational trust.
- Although Soldiers who commit violent criminal offenses are distinct from Soldiers who do not commit violent criminal offenses, there are a number of similarities between the two groups when resilience is examined at the scale level.
    - The two groups are statistically similar in terms of adaptability, bad coping, and good coping.
- Most differences largely held true even when we controlled for demographics.

3. GENERAL DISCUSSION AND CONCLUSION

The goal of the Comprehensive Soldier Fitness Program is to increase Soldier resilience and enhance performance by providing Soldiers with skills needed to take care of themselves, their families, and their peers. De-identified responses on the Global Assessment Tool provide a set of resilience measures that can be used to begin examining the relationship of resilience to performance and behavioral outcomes among Soldiers. The CSF evaluation team is charged with examining these relationships to lay a foundation for understanding the impact of CSF activities and the program's effectiveness in increasing Soldier resilience.

Results from our analyses show that there are differences between Soldiers who complete suicide and those who do not. Soldiers who complete suicide report being less spiritual; less satisfied within their family situation; have weaker friendships, if any; are less optimistic and adaptable; show signs of poor coping; and have fewer positive emotions, if any. Likewise, they rated their common character strengths (e.g., creativity, wisdom, courage, honesty, etc.) much lower than living Soldiers did. Finally, Soldiers who completed suicide reported being more depressed, lonely, and tended to think in more catastrophic terms than living Soldiers. These findings largely held even after we controlled for demographics (gender, rank, MOS, and marital status).

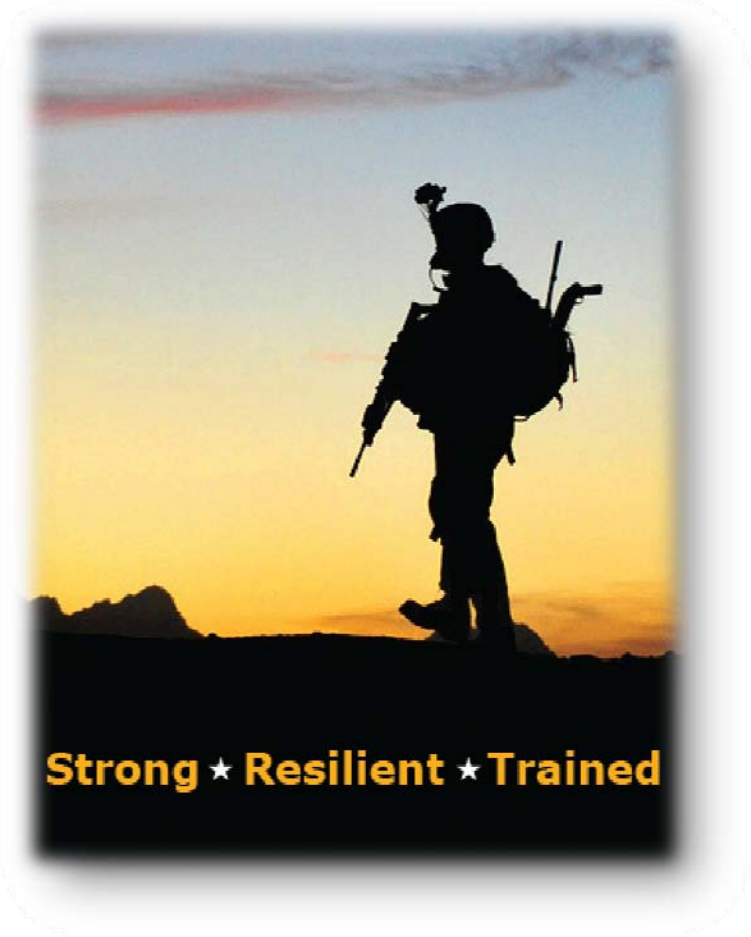
The results of these analyses also showed that Soldiers who had tested positive for drugs scored lower on each of the four dimensions of Soldier fitness as measured by the GAT. When we moved to examine differences in fitness at the scale level between Soldiers who had positive urinalyses and those who did not, the results held. The results also held when controlling for any potential effects that might arise due to the observed demographic differences between the two groups.

Additionally, our analyses showed that Soldiers who committed violent criminal offenses were less resilient across each of the four dimensions of the GAT than Soldiers who did not commit violent criminal offenses. Once again, the results largely held when we examined differences at the scale level. However, mean scores on adaptability and coping were not significantly different suggesting that violent criminal offenders did not differ from the general group of Soldiers on these two sub-dimensions of Soldier fitness.

In sum, the results of this set of analyses provide evidence that there are, in fact, statistical relationships between the GAT and behavioral outcomes of interest. In particular, it appears that the four dimensions of Soldier fitness as measured by the GAT are statistically related to negative behavioral outcomes that have strong implications for both individual Soldier fitness and the overall readiness of the force.

Finally, we must return to the original intent of the GAT. The GAT was designed to serve as a self-awareness tool for the Soldier and help Comprehensive Soldier Fitness understand how resilience is associated with positive and negative outcomes in the Army, rather than to allow us to *predict* such outcomes. With this in mind, we stress that

the GAT **does not** allow us to speak to causal relationships between resilience and behavioral outcomes. Rather, the GAT and our analytic approach only allow us to speak to the statistical relationships between resilience and behavioral outcomes of interest.



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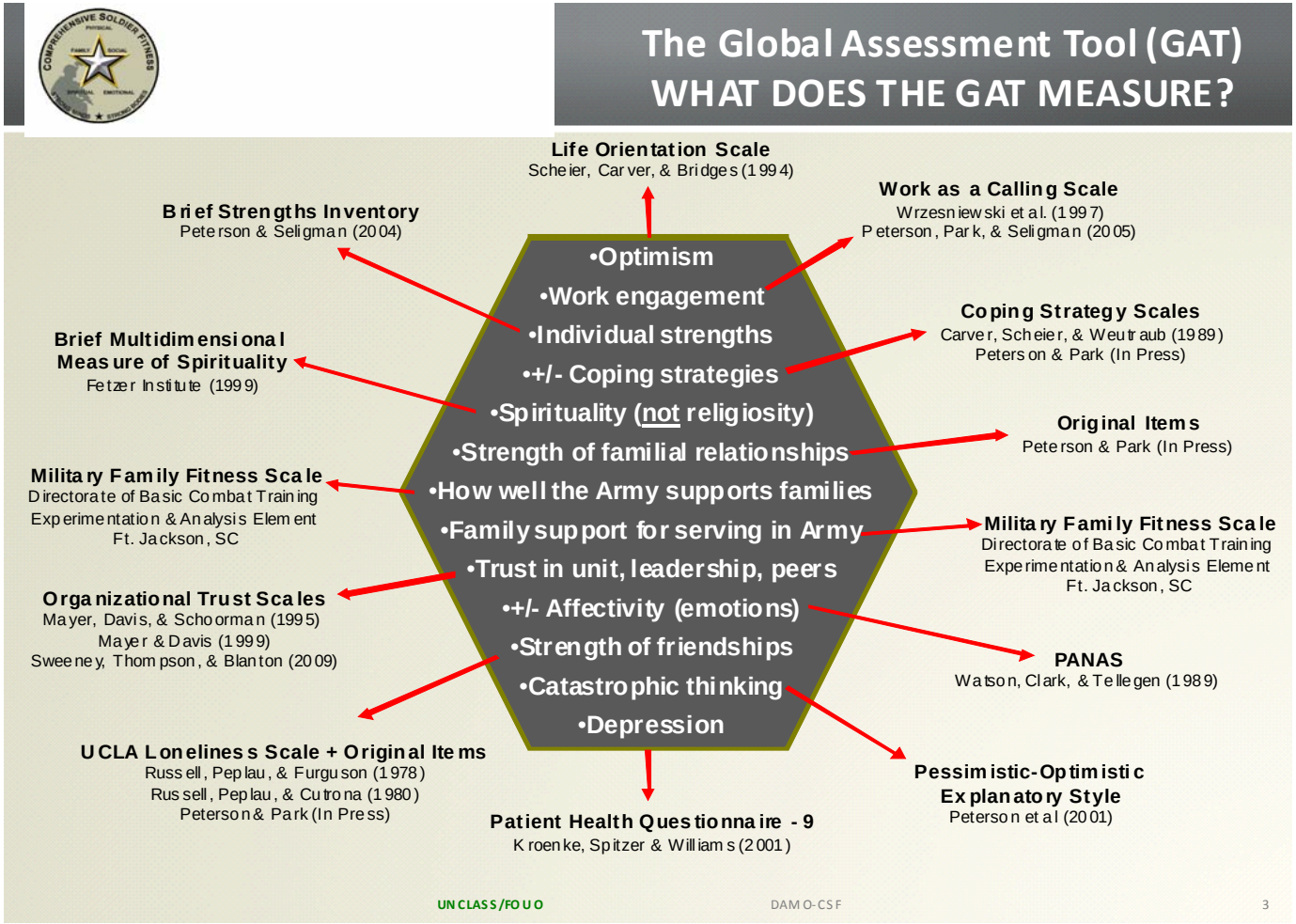
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APPENDIX A – Survey Instruments Used to Create the GAT

Dimension	Scale	Scale Name	Source/Citation
Emotional Fitness	Adaptability		Written by Professors Peterson and Park to measure flexibility.
	Bad/Good Coping		Written by Professors Peterson and Park, based on and paraphrasing other questionnaires, to measure strategies of coping, including problem-focused coping, emotion-focused coping, avoidance, positive reframing, and religious coping. Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56, 267-283.
	Catastrophizing	Explanatory Style	Measure pessimistic-optimistic explanatory style (catastrophizing-decatastrophizing) and are based on previously-used items. Peterson, C., Bishop, M. P., Fletcher, C. W., Kaplan, M. R., Yesko, E. S., Moon, C. H., Smith, J. S., Michaels, C. E., & Michaels, A. J. (2001). Explanatory style as a risk factor for traumatic mishaps. *Cognitive Therapy and Research*, 25, 633-649.
	Character	Brief Strengths Test	From the Brief Strengths Inventory written by Professors Peterson and Park and have already been used with USMA Cadets and with deployed Soldiers. These items converge well with the respective character strength scales of the Values in Action Inventory of Strengths. Peterson, C. (2007). *Brief Strengths Test*. Cincinnati: VIA Institute. Peterson, C., & Seligman, M. E. P. (2004). *Character Strengths and Virtues: A Handbook and Classification*. New York: Oxford University Press/Washington, DC: American Psychological Association.
	Depression	Patient Health Questionnaire	From the Patient Health Questionnaire, already used by the United States Army to screen for depression. Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16, 606-613.

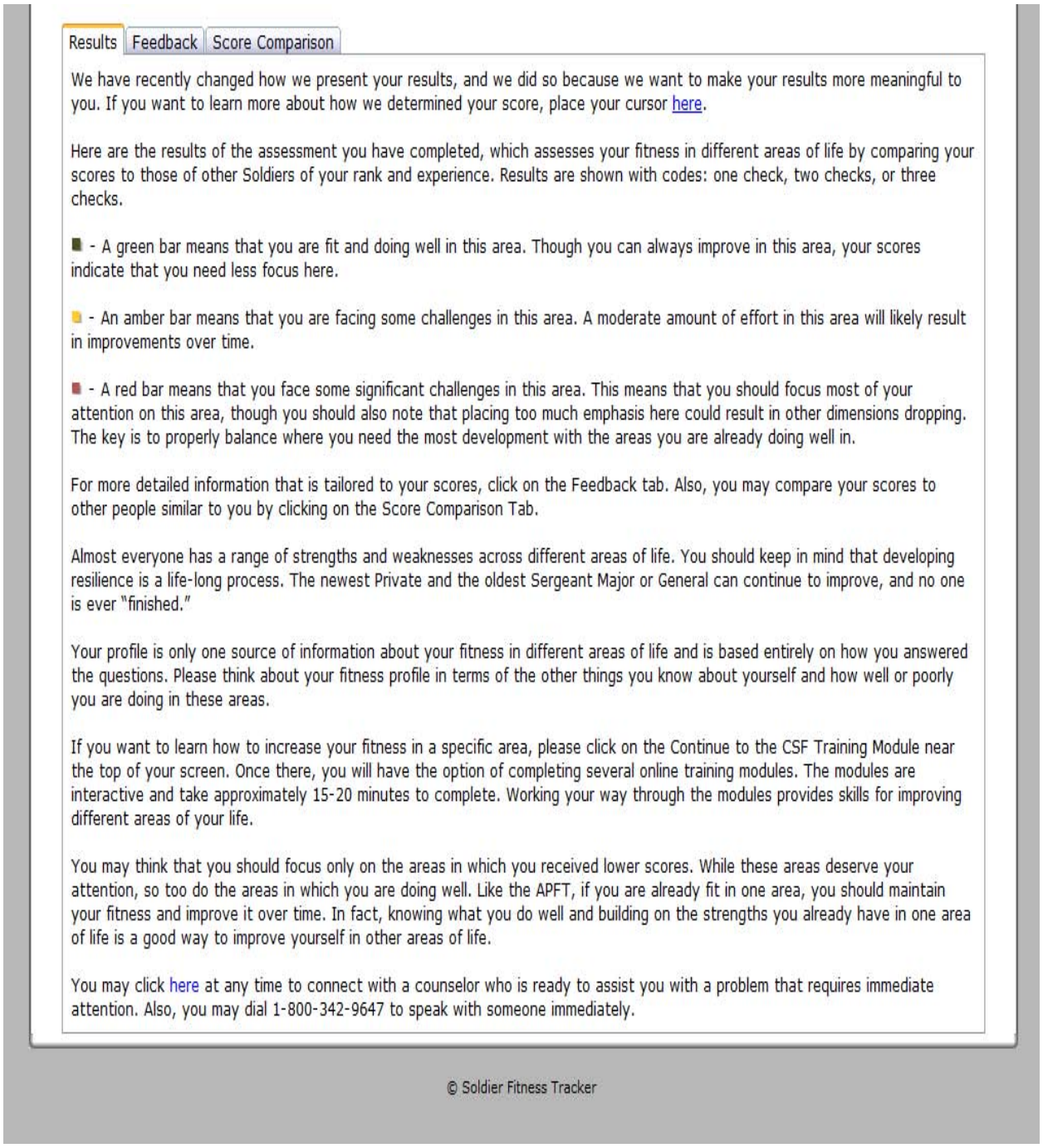
Dimension	Scale	Scale Name	Source/Citation
	Optimism	Life Orientation Test (revised)	Measuring dispositional optimism. Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, 67, 1063-1078.
	Positive/Negative Affect	Positive and Negative Affect Schedule (PANAS)	Measures positive affect and negative affect. Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.
Family Fitness	Family Satisfaction		Written by Professors Peterson and Park.
	Family Support	Military Family Fitness Scale	Derived from the Military Family Fitness Scale, developed by the Directorate of Basic Combat Training's Experimentation & Analysis Element, Fort Jackson, for an in-progress study.
Social Fitness	Engagement	Work as a Calling Scale, and the engagement subscale of the Orientations to Happiness Scale	Wrzesniewski, A., McCauley, C. R., Rozin, P., & Schwartz, B. (1997). Jobs, careers, and callings: People's relations to their work. *Journal of Research in Personality*, 31, 21-33. Peterson, C., Park, N., & Seligman, M. E. P. (2005). Orientations to happiness and life satisfaction: The full life versus the empty life. *Journal of Happiness Studies*, 6, 25-41.
	Friendship		Written by Professors Peterson and Park to assess social engagement.
	Loneliness	UCLA Loneliness Scale	Measures loneliness and social engagement. Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, 39, 472-480. Russell, D., Peplau, L. A., & Ferguson, M. L. (1978). Developing a measure of loneliness. *Journal of Personality Assessment*, 42, 290-294.
	Organizational Trust	Organizational trust scales	Measures trust and are military adaptations by COL Patrick Sweeney of organizational trust scales and have been used with deployed Soldiers. Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20, 709-734. Mayer, R. C. & Davis, J. H. (1999). The effect of the performance appraisal system on trust for management: A field quasi-experiment.

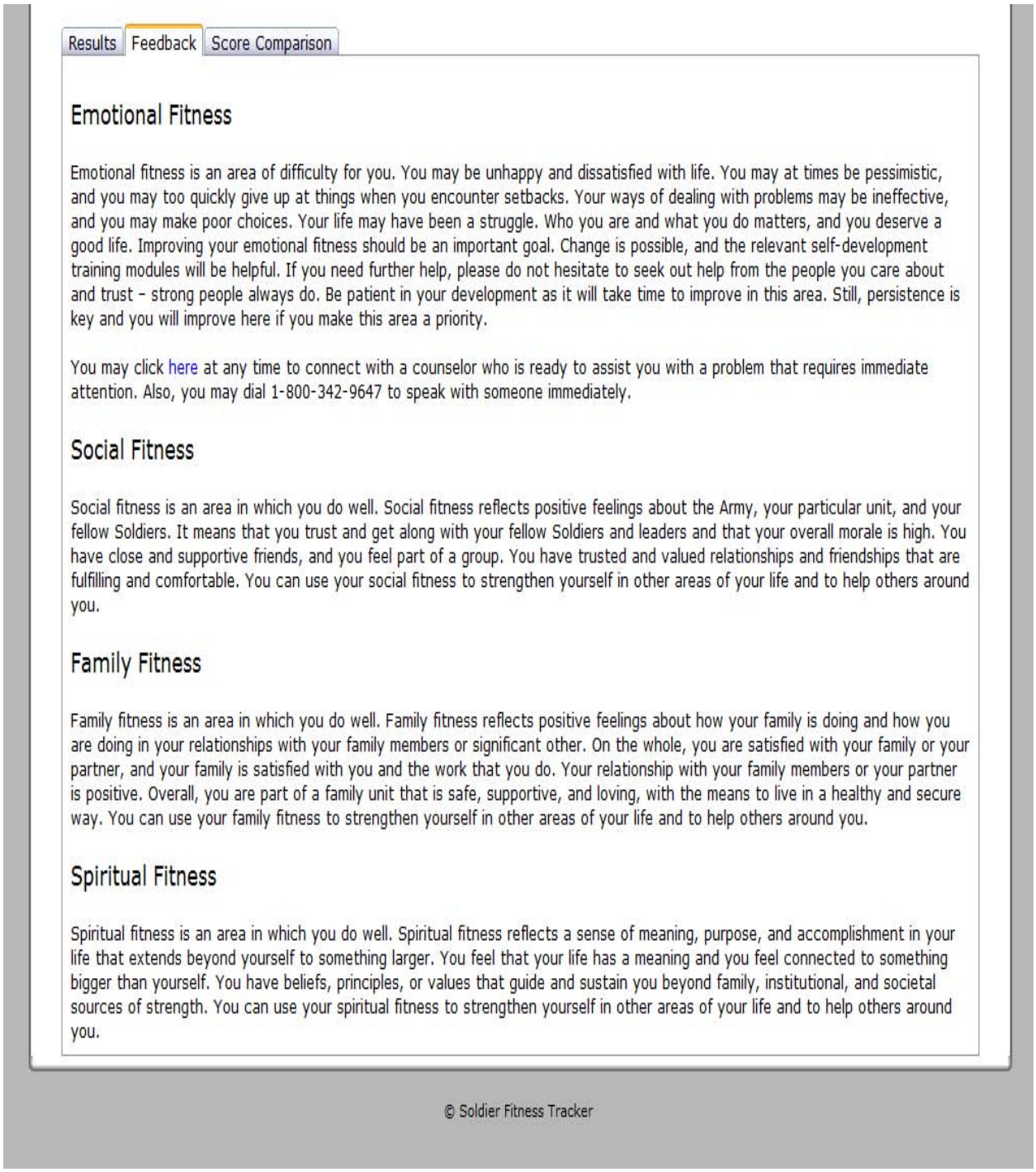
Dimension	Scale	Scale Name	Source/Citation
			Journal of Applied Psychology, 84, 123-136. Sweeney, P. J., Thompson, V. D., & Blanton, H., (2009). Trust and influence in combat: An interdependence model. *Journal of Applied Social Psychology*, 39, 235-264.
Spiritual Fitness	Spirituality	Brief Multidimensional Measure of Religiousness/Spirituality	Adapted from the Brief Multidimensional Measure of Religiousness/Spirituality of the Fetzer Institute. Fetzer Institute (1999). Multidimensional Measurement of Religiousness/Spirituality for Use in Health Research. Kalamazoo, MI.

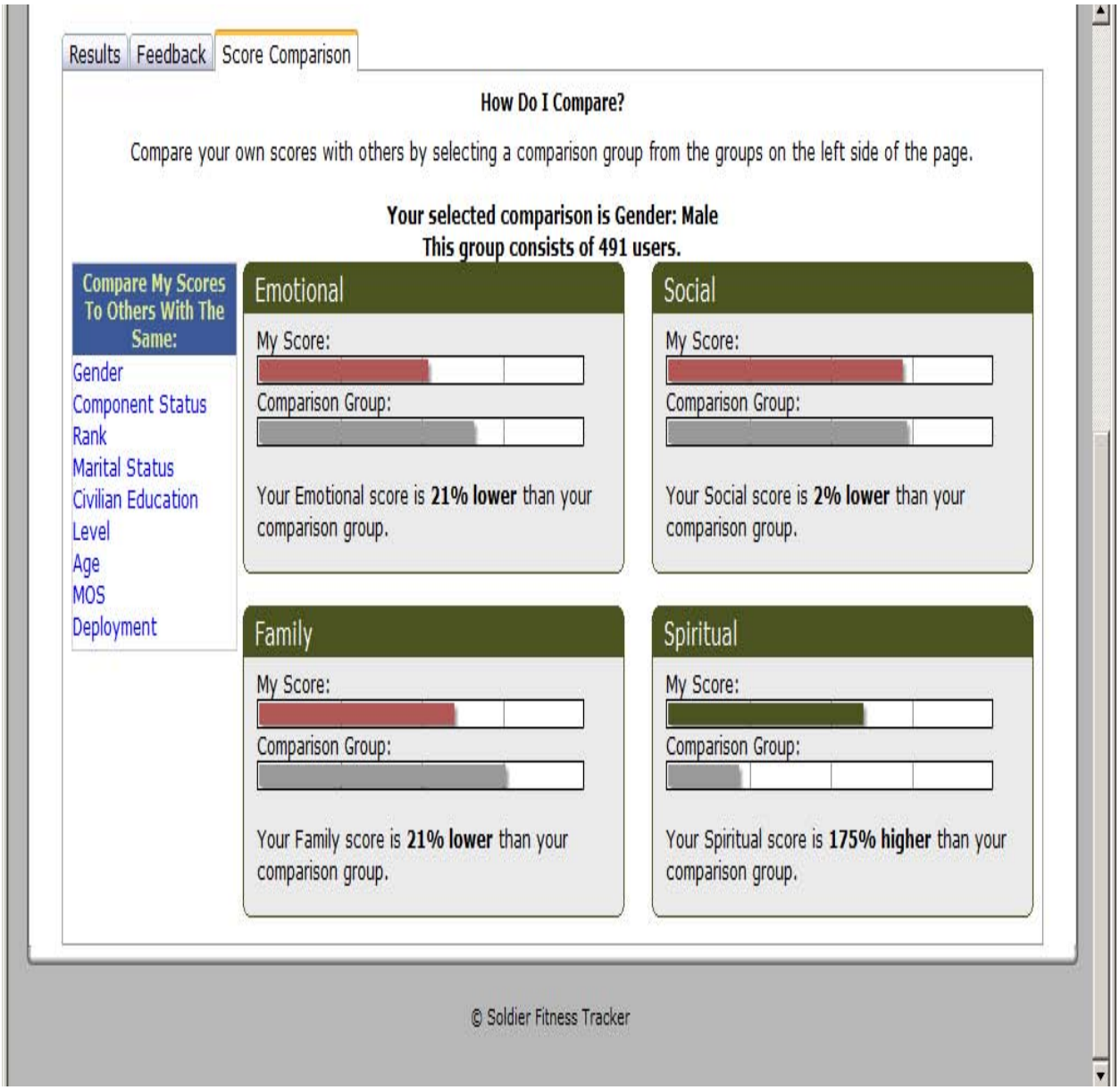


APPENDIX B – Soldier GAT Feedback Example




Results
Feedback
Score Comparison
We have recently changed how we present your results, and we did so because we want to make your results more meaningful to you. If you want to learn more about how we determined your score, place your cursor here.
Here are the results of the assessment you have completed, which assesses your fitness in different areas of life by comparing your scores to those of other Soldiers of your rank and experience. Results are shown with codes: one check, two checks, or three checks.
- A green bar means that you are fit and doing well in this area. Though you can always improve in this area, your scores indicate that you need less focus here.
- An amber bar means that you are facing some challenges in this area. A moderate amount of effort in this area will likely result in improvements over time.
- A red bar means that you face some significant challenges in this area. This means that you should focus most of your attention on this area, though you should also note that placing too much emphasis here could result in other dimensions dropping. The key is to properly balance where you need the most development with the areas you are already doing well in.
For more detailed information that is tailored to your scores, click on the Feedback tab. Also, you may compare your scores to other people similar to you by clicking on the Score Comparison Tab.
Almost everyone has a range of strengths and weaknesses across different areas of life. You should keep in mind that developing resilience is a life-long process. The newest Private and the oldest Sergeant Major or General can continue to improve, and no one is ever "finished."
Your profile is only one source of information about your fitness in different areas of life and is based entirely on how you answered the questions. Please think about your fitness profile in terms of the other things you know about yourself and how well or poorly you are doing in these areas.
If you want to learn how to increase your fitness in a specific area, please click on the Continue to the CSF Training Module near the top of your screen. Once there, you will have the option of completing several online training modules. The modules are interactive and take approximately 15-20 minutes to complete. Working your way through the modules provides skills for improving different areas of your life.
You may think that you should focus only on the areas in which you received lower scores. While these areas deserve your attention, so too do the areas in which you are doing well. Like the APFT, if you are already fit in one area, you should maintain your fitness and improve it over time. In fact, knowing what you do well and building on the strengths you already have in one area of life is a good way to improve yourself in other areas of life.
You may click here at any time to connect with a counselor who is ready to assist you with a problem that requires immediate attention. Also, you may dial 1-800-342-9647 to speak with someone immediately.
© Soldier Fitness Tracker


Results
Feedback
Score Comparison
Emotional Fitness
Emotional fitness is an area of difficulty for you. You may be unhappy and dissatisfied with life. You may at times be pessimistic, and you may too quickly give up at things when you encounter setbacks. Your ways of dealing with problems may be ineffective, and you may make poor choices. Your life may have been a struggle. Who you are and what you do matters, and you deserve a good life. Improving your emotional fitness should be an important goal. Change is possible, and the relevant self-development training modules will be helpful. If you need further help, please do not hesitate to seek out help from the people you care about and trust – strong people always do. Be patient in your development as it will take time to improve in this area. Still, persistence is key and you will improve here if you make this area a priority.
You may click here at any time to connect with a counselor who is ready to assist you with a problem that requires immediate attention. Also, you may dial 1-800-342-9647 to speak with someone immediately.
Social Fitness
Social fitness is an area in which you do well. Social fitness reflects positive feelings about the Army, your particular unit, and your fellow Soldiers. It means that you trust and get along with your fellow Soldiers and leaders and that your overall morale is high. You have close and supportive friends, and you feel part of a group. You have trusted and valued relationships and friendships that are fulfilling and comfortable. You can use your social fitness to strengthen yourself in other areas of your life and to help others around you.
Family Fitness
Family fitness is an area in which you do well. Family fitness reflects positive feelings about how your family is doing and how you are doing in your relationships with your family members or significant other. On the whole, you are satisfied with your family or your partner, and your family is satisfied with you and the work that you do. Your relationship with your family members or your partner is positive. Overall, you are part of a family unit that is safe, supportive, and loving, with the means to live in a healthy and secure way. You can use your family fitness to strengthen yourself in other areas of your life and to help others around you.
Spiritual Fitness
Spiritual fitness is an area in which you do well. Spiritual fitness reflects a sense of meaning, purpose, and accomplishment in your life that extends beyond yourself to something larger. You feel that your life has a meaning and you feel connected to something bigger than yourself. You have beliefs, principles, or values that guide and sustain you beyond family, institutional, and societal sources of strength. You can use your spiritual fitness to strengthen yourself in other areas of your life and to help others around you.
© Soldier Fitness Tracker


Results
Feedback
Score Comparison
How Do I Compare?
Compare your own scores with others by selecting a comparison group from the groups on the left side of the page.
Your selected comparison is Gender: Male
This group consists of 491 users.
Compare My Scores To Others With The Same:
Gender
Component Status
Rank
Marital Status
Civilian Education Level
Age
MOS
Deployment
Emotional
My Score:
Comparison Group:
Your Emotional score is 21% lower than your comparison group.
Social
My Score:
Comparison Group:
Your Social score is 2% lower than your comparison group.
Family
My Score:
Comparison Group:
Your Family score is 21% lower than your comparison group.
Spiritual
My Score:
Comparison Group:
Your Spiritual score is 175% higher than your comparison group.
© Soldier Fitness Tracker

APPENDIX C – Statistical Tests

Table C-1. Correlation Table of the GAT Completed by All Users

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. Active Army	1																						
2. Gender	-.059	1																					
3. Married	.122	-.121	1																				
4. Rank	-.001	-.007	.273	1																			
5. Emotional Fitness	-.103	.033	.031	.097	1																		
6. Adaptability	-.041	-.018	.015	.045	.619	1																	
7. Bad Coping	-.051	.076	.059	.128	.197	.077	1																
8. Catastrophizing	-.059	.019	.043	.108	.638	.416	.222	1															
9. Character	-.068	.040	.024	.040	.831	.502	.029	.323	1														
10. Depression	-.096	-.001	.020	.110	.729	.350	.180	.538	.372	1													
11. Good Coping	-.052	-.020	.004	.038	.687	.570	-.080	.362	.608	.360	1												
12. Negative Affect	-.072	-.026	.021	.084	.711	.378	.163	.557	.346	.713	.381	1											
13. Optimism	-.090	.054	.051	.163	.692	.423	.188	.581	.446	.486	.474	.488	1										
14. Positive Affect	-.105	.061	-.004	.024	.800	.451	.114	.385	.623	.520	.554	.474	.556	1									
15. Family Fitness	-.065	-.039	.348	.114	.345	.184	.082	.181	.283	.244	.220	.221	.260	.342	1								
16. Family Satisfaction	-.018	-.042	.423	.138	.254	.124	.092	.137	.221	.171	.141	.155	.188	.241	.780	1							
17. Family Support	-.083	-.026	.188	.061	.313	.177	.050	.162	.248	.228	.216	.206	.240	.319	.876	.381	1						
18. Social Fitness	-.130	-.012	-.006	.073	.693	.434	.108	.373	.563	.490	.512	.458	.515	.657	.362	.213	.371	1					
19. Engagement	-.098	.018	.019	.122	.442	.310	.013	.184	.420	.250	.389	.235	.322	.415	.228	.097	.262	.696	1				
20. Friendship	-.104	.027	-.018	.018	.495	.264	.139	.286	.361	.412	.307	.353	.361	.488	.284	.218	.251	.703	.226	1			
21. Loneliness	-.071	-.006	.018	.033	.663	.435	.189	.449	.485	.495	.437	.485	.523	.599	.297	.227	.263	.718	.317	.518	1		
22. Org. Trust	-.099	-.065	-.026	.037	.474	.295	.016	.229	.400	.321	.378	.312	.343	.454	.259	.107	.299	.789	.435	.340	.417	1	
23. Spiritual	-.087	.091	.037	.103	.619	.387	.064	.282	.590	.335	.544	.304	.489	.576	.295	.204	.278	.546	.437	.355	.439	.377	1

N = 791116-791973

Table C-2. Correlation Table of the GAT for Soldiers who Completed Suicide

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. Active Army	1																						
2. Gender	-.047	1																					
3. Married	.153	.141	1																				
4. Rank	.047	-.046	.104	1																			
5. Emotional Fitness	-.236	-.121	.013	-.017	1																		
6. Adaptability	-.100	-.039	-.100	.024	.616	1																	
7. Bad Coping	-.048	.057	-.108	.043	.174	.092	1																
8. Catastrophizing	-.012	-.095	-.096	-.092	.550	.337	.203	1															
9. Character	-.334	-.053	.109	-.035	.843	.468	.122	.275	1														
10. Depression	-.001	-.122	.012	.059	.807	.439	.102	.505	.467	1													
11. Good Coping	-.253	-.153	.018	.026	.747	.619	-.115	.282	.621	.498	1												
12. Negative Affect	-.056	-.192	.007	.028	.726	.327	.056	.479	.407	.805	.431	1											
13. Optimism	-.083	-.120	-.043	.030	.837	.530	.138	.552	.602	.689	.638	.589	1										
14. Positive Affect	-.274	-.063	-.085	-.095	.775	.558	.049	.308	.574	.564	.739	.406	.718	1	.								
15. Family Fitness	-.241	.034	.242	.087	.345	.159	-.183	.092	.254	.273	.306	.356	.306	.381	1								
16. Family Satisfaction	-.092	.015	.369	.068	.294	.165	-.089	.075	.226	.227	.240	.335	.235	.265	.832	1							
17. Family Support	-.299	.040	.104	.083	.313	.123	-.213	.086	.223	.251	.292	.300	.295	.387	.920	.548	1						
18. Social Fitness	-.353	.042	-.031	-.014	.748	.487	.000	.315	.597	.544	.705	.478	.723	.780	.460	.350	.447	1					
19. Engagement	-.189	.021	-.060	.099	.522	.416	-.113	.162	.430	.350	.563	.368	.527	.523	.323	.310	.267	.693	1				
20. Friendship	-.171	.063	.058	.081	.610	.317	.131	.380	.464	.480	.489	.426	.542	.576	.378	.318	.344	.757	.285	1			
21. Loneliness	-.277	.129	-.009	-.033	.668	.405	.123	.212	.497	.612	.502	.420	.642	.705	.330	.264	.312	.792	.350	.599	1		
22. Org. Trust	-.422	.002	-.070	-.181	.515	.372	-.084	.182	.441	.289	.588	.263	.528	.609	.359	.187	.410	.820	.486	.410	.549	1	
23. Spiritual	-.282	.037	.068	.064	.720	.487	-.040	.175	.608	.536	.700	.443	.647	.768	.455	.379	.418	.750	.627	.558	.656	.492	1

N = 84-85

Table C-3. Correlation Table of the GAT for Soldiers with Positive UAs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. Active Army	1																						
2. Gender	-.004	1																					
3. Married	-.004	.031	1																				
4. Rank	.020	.045	.126	1																			
5. Emotional Fitness	.000	.016	.045	.032	1																		
6. Adaptability	-.008	.005	.029	.005	.662	1																	
7. Bad Coping	-.026	.011	.027	.034	.087	-.002	1																
8. Catastrophizing	-.024	.029	.035	.015	.603	.409	.208	1															
9. Character	.015	.024	.051	.036	.838	.554	-.104	.281	1														
10. Depression	-.018	.012	.004	.033	.750	.392	.173	.563	.378	1													
11. Good Coping	.018	-.026	.009	.004	.705	.623	-.201	.294	.667	.356	1												
12. Negative Affect	-.013	-.027	.033	.009	.694	.365	.180	.571	.310	.769	.342	1											
13. Optimism	.001	.046	.032	.042	.719	.481	.120	.578	.475	.543	.503	.532	1										
14. Positive Affect	.013	.015	.031	.009	.795	.526	.005	.336	.652	.510	.601	.414	.575	1									
15. Family Fitness	-.012	.041	.251	.104	.350	.235	.027	.155	.319	.227	.256	.181	.255	.342	1								
16. Family Satisfaction	-.012	.036	.251	.076	.250	.167	.051	.125	.244	.149	.155	.120	.169	.228	.785	1							
17. Family Support	-.009	.033	.178	.098	.325	.219	.000	.134	.285	.222	.260	.176	.248	.331	.879	.394	1						
18. Social Fitness	.017	.001	.041	.061	.731	.519	-.026	.323	.639	.507	.583	.428	.538	.696	.385	.217	.403	1					
19. Engagement	.030	.030	.057	.131	.488	.369	-.081	.145	.488	.282	.460	.221	.338	.466	.291	.112	.345	.734	1				
20. Friendship	-.001	.030	.006	-.019	.519	.348	.031	.271	.410	.407	.382	.329	.407	.501	.285	.224	.250	.707	.257	1			
21. Loneliness	-.010	-.014	.009	-.015	.683	.501	.090	.420	.527	.522	.462	.480	.551	.604	.284	.204	.263	.706	.327	.526	1		
22. Org. Trust	.023	-.042	.041	.061	.546	.374	-.072	.203	.499	.362	.448	.310	.373	.540	.290	.129	.330	.823	.524	.380	.439	1	
23. Spiritual	.008	.068	.059	.058	.652	.458	-.044	.246	.642	.353	.611	.297	.516	.607	.328	.226	.311	.614	.539	.389	.465	.447	1

N = 3067-3069

Table C-4. Correlation Table of the GAT for Soldiers who Committed Violent Criminal Offenses

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. Active Army	1																						
2. Gender	-	-																					
3. Married	.004	-	1																				
4. Rank	-.037	-	.210	1																			
5. Emotional Fitness	-.048	-	.129	-.032	1																		
6. Adaptability	-.138	-	.097	.121	.717	1																	
7. Bad Coping	.017	-	-.073	-.018	-.041	-.223	1																
8. Catastrophizing	.051	-	-.053	-.025	.525	.287	.218	1															
9. Character	-.040	-	.171	-.030	.834	.700	-.275	.186	1														
10. Depression	-.009	-	.092	.018	.669	.282	.200	.555	.237	1													
11. Good Coping	-.074	-	.114	-.079	.716	.672	-.345	.219	.692	.257	1												
12. Negative Affect	-.024	-	-.007	-.003	.628	.263	.217	.557	.176	.790	.300	1											
13. Optimism	-.083	-	.025	-.004	.686	.494	.028	.443	.430	.501	.523	.493	1										
14. Positive Affect	-.058	-	.108	-.086	.846	.615	-.072	.295	.701	.492	.617	.424	.634	1									
15. Family Fitness	-.036	-	.265	.042	.306	.177	-.126	-.042	.343	.193	.204	.089	.136	.317	1								
16. Family Satisfaction	.024	-	.252	.045	.223	.087	-.076	-.019	.235	.168	.092	.085	.133	.240	.786	1							
17. Family Support	-.073	-	.194	.028	.280	.195	-.127	-.048	.326	.154	.232	.066	.098	.282	.866	.372	1	.					
18. Social Fitness	-.066	-	.045	.006	.777	.653	-.159	.210	.740	.423	.621	.334	.488	.767	.375	.209	.394	1					
19. Engagement	-.053	-	.024	.087	.483	.438	-.037	.053	.534	.229	.382	.091	.208	.473	.315	.103	.391	.691	1				
20. Friendship	.007	-	-.055	-.062	.496	.381	-.105	.226	.389	.380	.288	.346	.332	.481	.235	.204	.189	.658	.137	1			
21. Loneliness	-.037	-	.067	-.034	.720	.566	-.078	.312	.608	.457	.519	.383	.522	.719	.253	.227	.197	.756	.275	.544	1		
22. Org. Trust	-.099	-	.094	.011	.647	.570	-.223	.096	.667	.254	.641	.227	.429	.645	.301	.120	.354	.860	.551	.349	.569	1	
23. Spiritual	-.097	-	.029	.001	.713	.673	-.216	.188	.672	.343	.617	.325	.594	.683	.221	.178	.187	.650	.450	.405	.507	.566	1

N = 132

Table C-5. Independent Sample t-tests Comparing Soldiers who Completed Suicide to Soldiers who did not Complete Suicide[1]

Variables	Suicide[2]		Control[3]			
	M	SD	M	SD	t	p
Emotional Fitness	3.46	(.75)	3.84	(.56)	4.60	.000
Adaptability	3.67	(.87)	3.94	(.74)	2.96	.004
Bad Coping (reverse)	2.55	(1.09)	2.75	(.91)	1.66	.100
Catastrophizing (reverse)	3.67	(.86)	4.00	(.73)	3.47	.001
Good Coping	3.45	(.93)	3.72	(.71)	2.69	.009
Character	3.50	(1.03)	3.86	(.79)	3.28	.001
Depression (reverse)	3.84	(1.15)	4.34	(.80)	3.99	.000
Negative Affect (reverse)	3.45	(.92)	3.74	(.69)	2.93	.004
Positive Affect	3.19	(1.00)	3.68	(.80)	4.49	.000
Optimism	3.24	(1.03)	3.70	(.85)	4.10	.000
Family Fitness	3.17	(1.42)	3.59	(1.09)	2.75	.007
Family Satisfaction	3.00	(1.67)	3.70	(1.43)	3.87	.000
Family Support	3.28	(1.57)	3.52	(1.23)	1.41	.163
Social Fitness	3.63	(.85)	3.89	(.64)	2.76	.007
Engagement	3.56	(1.07)	3.70	(.92)	1.19	.236
Friendship	3.89	(1.23)	4.35	(.91)	3.42	.001
Loneliness	3.27	(1.12)	3.70	(.86)	3.50	.001
Organizational Trust	3.71	(1.03)	3.78	(.84)	0.64	.522
Spiritual Fitness	3.16	(1.10)	3.69	(.92)	4.43	.000

[1]Results correspond to Figures 1and 2
[2]N=84-85
[3]N=791234-791887

Table C-6. Independent Sample t-tests Comparing Soldiers with a Positive UA to Soldiers who did not Have a Positive UA[1]

Variables	Positive UA[2]		Control[3]			
	M	SD	M	SD	t	p
Emotional Fitness	3.47	(.71)	3.84	(.56)	28.67	.000
Adaptability	3.72	(.86)	3.95	(.74)	14.42	.000
Bad Coping (reverse)	2.61	(.96)	2.75	(.91)	8.31	.000
Catastrophizing (reverse)	3.67	(.87)	4.00	(.73)	20.65	.000
Good Coping	3.48	(.86)	3.72	(.71)	15.40	.000
Character	3.50	(1.05)	3.87	(.79)	19.24	.000
Depression (reverse)	3.79	(1.09)	4.34	(.80)	27.80	.000
Negative Affect (reverse)	3.37	(.86)	3.74	(.69)	23.79	.000
Positive Affect	3.30	(.94)	3.68	(.79)	22.50	.000
Optimism	3.30	(.93)	3.70	(.85)	24.02	.000
Family Fitness	3.11	(1.20)	3.60	(1.09)	22.66	.000
Family Satisfaction	3.22	(1.55)	3.70	(1.43)	17.38	.000
Family Support	3.03	(1.34)	3.52	(1.23)	20.21	.000
Social Fitness	3.53	(.79)	3.89	(.64)	24.82	.000
Engagement	3.23	(1.14)	3.70	(.92)	22.89	.000
Friendship	4.06	(1.07)	4.35	(.91)	15.12	.000
Loneliness	3.46	(.98)	3.70	(.86)	13.85	.000
Organizational Trust	3.41	(1.03)	3.78	(.84)	20.40	.000
Spiritual Fitness	3.32	(1.05)	3.69	(.91)	19.25	.000

[1]Results correspond to Figures 3 and 4
[2]N=3068-3069
[3]N=788249-788903

Table C-7. Independent Sample t-tests Comparing Soldiers with a Violent Criminal Offense to Soldiers who did not Commit a Violent Criminal Offense

Variables	Violent Crime [2]		Control[3]			
	M	SD	M	SD	t	p
Emotional Fitness	3.51	(.72)	3.84	(.56)	5.29	.000
Adaptability	3.82	(.83)	3.94	(.74)	1.68	.096
Bad Coping (reverse)	2.61	(.95)	2.75	(.91)	1.66	.100
Good Coping	3.65	(.94)	3.72	(.71)	0.86	.393
Catastrophizing (reverse)	3.67	(.84)	4.00	(.73)	4.47	.000
Character	3.50	(1.20)	3.86	(.79)	3.46	.001
Depression (reverse)	3.87	(1.04)	4.34	(.80)	5.14	.000
Negative Affect (reverse)	3.40	(.92)	3.74	(.69)	4.25	.000
Positive Affect	3.30	(.94)	3.68	(.80)	4.61	.000
Optimism	3.36	(.82)	3.70	(.85)	4.80	.000
Family Fitness	3.15	(1.15)	3.59	(1.09)	4.40	.000
Family Satisfaction	3.09	(1.55)	3.70	(1.43)	4.55	.000
Family Support	3.20	(1.28)	3.52	(1.23)	2.92	.004
Social Fitness	3.58	(.75)	3.89	(.64)	4.79	.000
Engagement	4.47	(1.05)	3.70	(.92)	2.53	.013
Friendship	4.08	(.99)	4.35	(.91)	3.08	.002
Loneliness	3.35	(.98)	3.70	(.86)	4.09	.000
Organizational Trust	3.39	(.98)	3.78	(.84)	4.56	.000
Spiritual Fitness	3.33	(1.12)	3.69	(.92)	3.65	.000

[1]Results correspond to Figures 5 and 6
[2]N=132
[3]N=791633-791839

Demographic Analyses

Demographic Analyses for Completed Suicides

Table C-8. ANOVA for Emotional Fitness on Demographics and Completed Suicides

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4732.902[a]	5	946.580	3106.738	.000
Intercept	4571.273	1	4571.273	15003.212	.000
Gender	200.665	1	200.665	658.595	.000
Active	2240.294	1	2240.294	7352.790	.000
Rank	1937.935	1	1937.935	6360.429	.000
Married	18.726	1	18.726	61.461	.000
Suicide	10.951	1	10.951	35.943	.000
Error	232270.877	762328	.305		
Total	11500439.134	762334			
Corrected Total	237003.779	762333			

a. R Squared = .020 (Adjusted R Squared = .020)

Table C-9. ANOVA for Family Fitness on Demographics and Completed Suicides

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	122912.976[a]	5	24582.595	23890.148	.000
Intercept	3230.395	1	3230.395	3139.401	.000
Gender	7.689	1	7.689	7.473	.006
Active	10928.858	1	10928.858	10621.012	.000
Rank	199.821	1	199.821	194.193	.000
Married	105596.345	1	105596.345	102621.888	.000
Suicide	14.877	1	14.877	14.458	.000
Error	784422.769	762327	1.029		
Total	10813956.395	762333			
Corrected Total	907335.745	762332			

a. R Squared = .135 (Adjusted R Squared = .135)

Table C-10. ANOVA for Social Fitness on Demographics and Completed Suicides

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7015.190[a]	5	1403.038	3513.408	.000
Intercept	5001.484	1	5001.484	12524.433	.000
Female	139.806	1	139.806	350.095	.000
Active	4764.761	1	4764.761	11931.644	.000
Rank	1866.007	1	1866.007	4672.750	.000
Married	209.582	1	209.582	524.823	.000
Suicide	5.408	1	5.408	13.544	.000
Error	304425.847	762326	.399		
Total	11876326.323	762332			
Corrected Total	311441.036	762331			

a. R Squared = .023 (Adjusted R Squared = .023)

Table C-11. ANOVA for Spiritual Fitness on Demographics and Completed Suicides

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16520.467[a]	5	3304.093	4080.866	.000
Intercept	3937.601	1	3937.601	4863.307	.000
Gender	5069.845	1	5069.845	6261.736	.000
Active	4336.056	1	4336.056	5355.437	.000
Rank	5432.744	1	5432.744	6709.951	.000
Married	360.700	1	360.700	445.498	.000
Suicide	19.961	1	19.961	24.654	.000
Error	617083.342	762156	.810		
Total	11042609.383	762162			
Corrected Total	633603.809	762161			

a. R Squared = .026 (Adjusted R Squared = .026)

Demographic Analyses for Positive UAs

Table C-12. ANOVA for Emotional Fitness on Demographics and Positive UAs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4797.534[a]	5	959.507	3150.040	.000
Intercept	95770.458	1	95770.458	314412.309	.000
Gender	199.377	1	199.377	654.551	.000
Active	2197.832	1	2197.832	7215.433	.000
Rank	1916.459	1	1916.459	6291.694	.000
Married	18.714	1	18.714	61.438	.000
Pos Drugs	75.584	1	75.584	248.139	.000
Error	232206.245	762328	.305		
Total	11500439.134	762334			
Corrected Total	237003.779	762333			

a. R Squared = .020 (Adjusted R Squared = .020)

Table C-13. ANOVA for Family Fitness on Demographics and Positive UAs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	122985.070[a]	5	24597.014	23906.358	.000
Intercept	69160.273	1	69160.273	67218.331	.000
Gender	7.956	1	7.956	7.732	.005
Active	10816.185	1	10816.185	10512.479	.000
Rank	192.844	1	192.844	187.430	.000
Married	105595.325	1	105595.325	102630.329	.000
Pos Drugs	86.971	1	86.971	84.529	.000
Error	784350.675	762327	1.029		
Total	10813956.395	762333			
Corrected Total	907335.745	762332			

a. R Squared = .136 (Adjusted R Squared = .136)

Table C-14. ANOVA for Social Fitness on Demographics and Positive UAs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7056.464[a]	5	1411.293	3534.559	.000
Intercept	102937.030	1	102937.030	257804.046	.000
Gender	140.665	1	140.665	352.293	.000
Active	4711.403	1	4711.403	11799.628	.000
Rank	1849.079	1	1849.079	4630.987	.000
Married	209.612	1	209.612	524.970	.000
Pos Drugs	46.682	1	46.682	116.915	.000
Error	304384.573	762326	.399		
Total	11876326.323	762332			
Corrected Total	311441.036	762331			

a. R Squared = .023 (Adjusted R Squared = .023)

Table C-15. ANOVA for Spiritual Fitness on Demographics and Positive UAs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16526.377[a]	5	3305.275	4082.365	.000
Intercept	87808.990	1	87808.990	108453.405	.000
Gender	5067.022	1	5067.022	6258.309	.000
Active	4295.953	1	4295.953	5305.958	.000
Rank	5410.311	1	5410.311	6682.307	.000
Married	360.653	1	360.653	445.445	.000
Pos Drugs	25.871	1	25.871	31.953	.000
Error	617077.432	762156	.810		
Total	11042609.383	762162			
Corrected Total	633603.809	762161			

a. R Squared = .026 (Adjusted R Squared = .026)

Demographic Analyses for Violent Criminal Offenses

Table C-16. ANOVA for Emotional Fitness on Demographics and Violent Criminal Offenses

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4727.358[a]	5	945.472	3103.024	.000
Intercept	6019.107	1	6019.107	19754.624	.000
Gender	200.628	1	200.628	658.459	.000
Active	2237.554	1	2237.554	7343.622	.000
Rank	1937.750	1	1937.750	6359.668	.000
Married	18.697	1	18.697	61.363	.000
Violent Offense	5.407	1	5.407	17.746	.000
Error	232276.422	762328	.305		
Total	11500439.134	762334			
Corrected Total	237003.779	762333			

a. R Squared = .020 (Adjusted R Squared = .020)

Table C-17. ANOVA for Family Fitness on Demographics and Violent Criminal Offenses

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	122907.031[a]	5	24581.406	23888.811	.000
Intercept	4276.744	1	4276.744	4156.244	.000
Gender	7.704	1	7.704	7.487	.006
Active	10920.620	1	10920.620	10612.926	.000
Rank	199.718	1	199.718	194.091	.000
Married	105593.427	1	105593.427	102618.274	.000
Violent Offense	8.932	1	8.932	8.680	.003
Error	784428.714	762327	1.029		
Total	10813956.395	762333			
Corrected Total	907335.745	762332			

a. R Squared = .135 (Adjusted R Squared = .135)

Table C-18. ANOVA for Social Fitness on Demographics and Violent Criminal Offenses

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7014.469[a]	5	1402.894	3513.039	.000
Intercept	6422.365	1	6422.365	16082.485	.000
Gender	139.885	1	139.885	350.291	.000
Active	4760.908	1	4760.908	11921.968	.000
Rank	1865.612	1	1865.612	4671.750	.000
Married	209.669	1	209.669	525.039	.000
Violent Offense	4.688	1	4.688	11.739	.001
Error	304426.567	762326	.399		
Total	11876326.323	762332			
Corrected Total	311441.036	762331			

a. R Squared = .023 (Adjusted R Squared = .023)

Table C-19. ANOVA for Spiritual Fitness on Demographics and Violent Criminal Offenses

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16504.457[a]	5	3300.891	4076.806	.000
Intercept	5438.680	1	5438.680	6717.108	.000
Gender	5070.339	1	5070.339	6262.184	.000
Active	4332.490	1	4332.490	5350.894	.000
Rank	5433.254	1	5433.254	6710.406	.000
Married	360.575	1	360.575	445.332	.000
Violent Offense	3.951	1	3.951	4.880	.027
Error	617099.352	762156	.810		
Total	11042609.383	762162			
Corrected Total	633603.809	762161			

a. R Squared = .026 (Adjusted R Squared = .026)

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COMPREHENSIVE SOLDIER FITNESS
PHYSICAL
FAMILY
SOCIAL
SPIRITUAL
EMOTIONAL
STRONG MINDS
STRONG BODIES