Atop The Tower: A Technician Perspective on Safety & Brief Exploration of Personality & Mental Health

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Introduction

The telecommunications industry is a high-risk occupation that involves working at heights. Technicians often work at heights from just over six feet to well over 1500 feet, depending on the particular structure in question. Technicians frequently voice concerns over deadlines, personal protective equipment (PPE), and the subcontracting paradigm as factors that affect the completion of their jobs. Combined, all of these variables could reasonably have an effect on technician's perception regarding their equipment and the execution of their duties.

The telecommunications industry is also a risky occupation. Research reveals that between 1984 and 2013 there have been over 300 fatalities recorded in the telecommunications industry (Landa, 2013). Often these fatalities are a result of falls, tower collapses, and other rather horrific circumstances. Technicians often spend great amounts of time living and traveling with one another, thus a pseudo-family bond often occurs. Therefore, while not all technicians have witnessed such a fatality, when such a loss occurs, it is often times distressing for the worker, and could possibly affect mental health and work performance. Furthermore, because of the shared bond (oftentimes referred to as a "brotherhood" by technicians), the loss of a worker may also have an effect on others in the field, even if they did not know the deceased worker personally.

Literature Review

Training

Regardless of the task a telecommunications worker might engage in (e.g. maintenance, modifications, erection, etc.) fall prevention has been a serious concern within the industry, and the Occupational Safety and Health Administration (OSHA), especially in the last several years (Michaels, 2014; National Association of Tower Erectors [NATE], 2014). Training for telecommunication workers is predominately provided through third party providers, in-house trainers through "train-the- trainer" programs, or an in-house training program within larger telecommunications companies approved by the industry (Occupational Health and Safety Administration [OSHA], 2015; National Association of Tower Erectors [NATE], 2015). In contrast, most employers within the Ironwork industry recommend a three to four year apprenticeship program and on-the-job-training (Irizarry, Simonsen, & Abraham, 2005). However, it was not until recently that the telecommunications industry has adopted an apprenticeship program (DOL, 2014). The Telecommunications Industry Registered Apprenticeship Program ("TIRAP") is "is a joint venture of the Department of Labor, government agencies, and the telecommunications industry members invested in improving workplace safety, addressing industry workforce needs, and providing employment and advancement opportunities" (Telecommunications Industry Registered Apprenticeship Program [TIRAP], 2015., pg. 1).

While not currently fully integrated within the industry as of the date of this paper, TIRAP's proponents expect that standardization of job descriptions and training requirements, a structured training process in which technicians must demonstrate learned skills and classroom training, will reduce the numbers of fatalities and injuries within the telecommunications

industry (TIRAP, 2015). It is also anticipated that TIRAP and will likely help in reducing injuries and fatalities. However, workers and companies must also be supportive and engaged in such efforts for success. Thus, this present research examined worker perceptions, attitudes, and behaviors towards safety, equipment, and deadlines under the subcontracting paradigm under which the industry functions.

Safety in Telecommunications

Over the last 31 years, falls have been the leading cause of death in the telecommunications industry. Telecommunications work is extremely dangerous if not performed correctly, and if workers and companies do not adhere to the safety guidelines set forth by OSHA and the industry, fatalities will continue. The purpose of these standards is to reduce or prevent the number of injuries and fatalities that result from falls and other hazards in the telecommunications industry. OSHA standards include those specifically addressing telecommunications, and standards addressing construction, and general industry (OSHA, 2015) Other standards, while not required by OSHA, are also available for the industry through the National Association of Tower Erectors (NATE) and American National Standards Institute (ANSI).

Despite the numerous safety regulations from OSHA, as well as best practices of NATE and ANSI, workers are still experiencing injuries and fatalities. Understanding and following the regulations are of extreme importance. However, research on workers' perspectives, while addressed through research in multiple industries, is sparse in regards to telecommunications. Understanding those perceptions is key in developing a safe workplace, as it allows everyone involved to understand the mindset of the workers performing the work and how best to support those workers for maximum efficiency.

Risk-Taking Behavior and Perception

Workers' perceptions are important because most recorded fatalities are due to risky behaviors (Hester, 2014). Hertz & Thomas (1993) defined risk as a chance of loss or injury, Fishhoff, Lichtenstein, Slovic, Derby, Keeney (1981) defined risk as a threat to health or life, and the Channing has defined risk as the likelihood that harm will occur (2014). Regardless of the definition, based upon OSHA summaries from 1984-2013, the causes of fatalities can be attributed largely to in large part, risky behavior. Wilde's (1982) homeostasis theory regarding risky behaviors states there are four variables that determine risk levels: Benefits of risky behavior options, costs of cautious behavior options, benefits of cautious behavior options, and costs of risky behavior options. Wilde states that the first two increase the "target level of risk," as the last two decrease it.

Given this, it is reasonable to assume that one would choose the actions that have the most desirable benefit. Additionally, the zero-risk theory, as put forth by Na¨¨atanen, & Summala, (1974) state that perception, motivation, and experimental forces that cause people to situations as "no-risk" guide people's actions. Both theories are based in worker perception, thus both may play an important role in understanding why telecommunication technicians make the decisions they do, and how training, incentives, and consequences could be utilized to prevent injuries or fatalities, and how increase preventative measures in the workplace.

It is reasonable to assume that the more experience one has in a particular high-risk situation or work environment, the more likely they are to view potential hazards as either inconsequential, or less hazardous than they truly are. Such attitudes may influence workers' decisions regarding safety control measures (Zimolong, 1985). Huang and Hinze (2003) supported these observations when they reported that one-third of accidents in the construction

industry were due to the workers misjudging potentially hazardous or dangerous situations. Another study in the construction industry reinforces this previous research indicating that poor training and enforcement of safety protocols, poor hazard recognition skills, poor attitudes toward a safety culture, and not using the appropriate PPE increase the risk of accidents (O'Toole, 2002).

Assessment of Risk Perception of Telecommunication Technicians

A technician's perception of the effectiveness of his/her equipment is crucial. Based on research from the construction industry, it is reasonable to assume that if a worker is not using or is improperly using equipment, it is more likely that they may experience an accident, an injury, or possibly even die while on the job. The perception of the effectiveness or usefulness of equipment is central to the technician's utilization of such equipment. This claim that was posited by Irizarry et al. (2005), found that construction workers slowly increase the duration of tasks when protected by PPE, and they are less likely to use equipment if their perception is that the PPE is obstructive to completing tasks in a timely manner (2005).

Furthermore, the choice to utilize safety measures such as PPE is largely contingent on the worker's perception. If a worker obtained training in an environment, where "toughness" is considered important or in environments where attitude, one's work ethic, and values and belief systems are poor, then those workers are less likely to utilize those safety measures (O'Toole, 2002). Choices that workers make based on perception are rooted in behavior; people make choices (of all kinds, not just safety) based largely on casual reasoning. Because of this, it is essential to examine the risk perception of workers.

Deadlines & Subcontracting in Telecommunications

Subcontracting is the current payment-by-results business model within the telecommunications industry. Payments are based upon the work completed as compared to time spent completing the work. This model, by definition, makes it more probable for workers to experience injury or accidents because payments and or future returns hinge upon completing the work in the shortest possible timeframe possible (Mayhew & Quinlan, 1997; Ofori & Debrah, 1998). This in turn makes it more likely that contractors or subcontractors will encourage or increase pressure on workers to take short cuts or perform in an unsafe manner, in order to complete the task (Mayhew, Quinlan, & Ferris, 1997).

This is a concern in the telecommunications industry. One may reasonably argue this could contribute to a disregard for individual safety measures and the safety culture of the industry as a whole, thereby placing workers at increased risk for injury or death. By its construction, the subcontracting model creates complicated layers of responsibility (both legally and morally) in the face of an accident, injury, or death. Furthermore, this model could potentially encourage isolated work sites, ineffective coverage of employees under regulatory insurance requirements, and sparse employment practice scrutiny.

Mental Health

While safety, training, and business models are important to the workplace, one may argue that the mental health of individual workers also has a direct impact on productivity and safety practices of workers. Work can be a positive and valuable source of accomplishment and self-efficacy (WHO, 2000); Employment provides needed encouragement, an increase in self-esteem, and provides people with a sense of accomplishment and pride (2000). However, work that requires attention to mentally and physically demanding conditions, is dangerous or life

threatening, and/or involves extensive amounts of travel can also create, exacerbate, and reactivate mental health disorders in employees (2000).

Other variables may also play a part in one's mental health status. Some of those variables include extended periods of unemployment, travel, drugs, alcohol, dangerous and physical demands of the occupation, and the relationships of workers with other workers as well as their relationships with their families. Extensive periods of travel and demanding and sometimes dangerous physical demands are commonplace in the telecommunications industry. One study reported an increased likelihood for irritability and loneliness (Barnett & Hyde, 2001), symptoms similar to that of Post-Traumatic Stress Disorder (PTSD) (Boss, 2006), mood issues/disorders, lack of energy (Voydanoff, 2005), loss of a sense of personal control (Westman & Etzion, 2005), and a host of other mental health issues. Thus, it is reasonable to assume that mental health issues, left untreated, could also pose serious consequences not only for the technician at work, but also at home.

Purpose

Identifying technician perceptions and realities of the workplace environment could potentially enhance technician safety, fall prevention, industry policies, technician training, and both personal and public safety in the workplace. The objective is to gain a better understanding of the worker's perspective and their professional and personal challenges in order to gain insight to what may or may not be beneficial to the technician, so that he/she can perform their work more safely and more efficiently.

This author intends to evaluate the telecommunication technicians' perception of safety as it relates to several areas that could affect workplace safety. These areas include proper climbing equipment, the use of climbing equipment, the technician's perception of fall risk,

technician mental health, the knowledge or witnessing of a death or injury, free climbing, the demographic characteristics of technicians, and the technician's perception of the deadlines inherent in the contracting/subcontracting paradigm.

The four specific hypotheses explored include the differences between technicians and instructors:

1. There is a difference between technicians and instructors perceptions of PPE, free climbing, and the effect of deadlines on their safety choices.
2. There is a perception difference concerning of PPE, free climbing, and the effect of deadlines between those who had witnessed an injury/fatality.
3. There is a difference between technicians and instructors perceptions of PPE, free climbing, and the effect of deadlines on their safety choices by, experience, and age.
4. There is a difference between technicians and instructors as it relates to technician mental health as measured by two mental health assessments.

Method

The researcher presented all survey tools in an online format for both ease of access and for logistical purposes. The researcher gave each participant a randomly generated participant number as the surveys were completed, and did not collect names or other personal identifiers. Due to the nature of the population as mentioned above, the researcher recruited participants by word of mouth, advertisements in blogs, four social media sites, training classes, and print articles published by the researcher in an industry magazine. The completion of the surveys was voluntary and each participant signed a waiver and/or completed a consent embedded within the survey before completion.

Participants

Based on industry deaths over the past five years, and the state of the industry's safety culture, it seemed appropriate and important to gather data from the perspective of the worker. As compared to the early 1980s, beneficial advancements have made the telecommunication industry safer. Additionally, the majority of the deaths since 1984 are attributable to technicians not following safety procedures such as remaining "tied-off" to the structures, not properly utilizing equipment (riding the line), poor rigging, or free climbing (Hester, 2014). Given this, it was reasonable to collect information directly from the technician to ascertain their perspective on the equipment they use on a daily basis to complete their job duties. Coding of variables extrapolated from the author-constructed survey corresponded to the nature of the data collected.

Inclusion criteria were that participants were a minimum of 18 years of age or older, worked full-time (approximately 40 or more hours per week), and whose main function is climbing telecommunication structures. In order to compare groups, the author separated respondents into two categories, "technician," and "instructor." "Technician" is the designation for a participant that is currently a technician or has been technician within the last five years. "Instructor" is the designation for a participant that is currently a technician or has been a technician within the last five years *and* is a certified technician safety and rescue instructor. Neither the education level nor experience (number years climbing structures) were determining factors of classification. A summary of demographic data are available in Tables 1-6.

When data collection began in 2014, the author used the most industry-accepted figure for the total population of approximately 9,800 technicians. Due to the mitigating factors in obtaining a concrete number of technicians, and the timing of the study's data collection, the

researcher accepted the 10,000 figure as it seemed most appropriate. There are limitations with this number however, and those concerns are addressed in the limitations section of the study.

Measures

The author collected information through three assessment tools, presented in one continuous survey online. The first tool gathered data on the technician's perceptions of equipment, free climbing, witnessing injury or fatality, deadlines, and safety. The remaining two instruments were assessments of mental health (described in more detail in the next section). One clinical psychometrist in Birmingham converted raw scores of the mental health assessments into coded data as dictated by Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) and Brief Symptom Inventory (BSI) manuals (Derogatis, & Spencer, 1982; Spitzer, Williams, Gibbon, & First, 1990). Furthermore, two graduates of the University of Alabama in Huntsville complied and cleaned coded data. A statistician and the author then analyzed the information and interpreted the results. No identifying information on any participant had been captured, thus, the author, psychometrist, coders, or statistician had no access to identifying information for the participants.

Technician Questionnaire. The author-constructed survey consisted of demographic questions relating to gender, experience, age, ethnicity, education, work position ("technician position" / "technician /safety position"), athleticism, and two open-ended questions about equipment usefulness. The remainder of the questions were presented as multiple choice items on a five-point scale with choices of completely disagree, disagree somewhat, neutral, agree somewhat, and completely agree. The multiple-choice questions addressed several areas of information. These included the technician's perception of safety because of proper climbing equipment, the use of climbing equipment, free climbing, witnessing injury, or fatality, and the

technician's perception of the contracting/subcontracting paradigm. The two remaining tools addressed the participants' mental health.

The Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II). The SCID-II, as an assessment tool, screens for Axis II Personality Disorders as described in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-V). Axis II diagnoses measure and screen for ten underlying pervasive or personality conditions and two appendix categories, as well as mental retardation (American Psychological Association [APA], 2013). These ten personality conditions (in order) include Avoidant Personality Disorder, Dependent Personality Disorder, Obsessive-Compulsive Personality Disorder, Passive-Aggressive Personality Disorder, Depressive Personality Disorder, Paranoid Personality Disorder, Schizotypal Personality Disorder, Schizoid Personality Disorder, Histrionic Personality Disorder, Narcissistic Personality Disorder, Borderline Personality Disorder, and Antisocial Personality Disorder. The SCID-II is a preemptive tool used by clinicians to shorten the interview time by clinicians during a full assessment rather than as a standalone tool, but Ball & Cecero (2001), had utilized the SCID-II as a standalone instrument. Put more plainly, while not intended as a standalone tool, past studies indicate the test is reliable enough as a rough assessment tool for this current study.

Brief Symptom Inventory (BSI). The BSI is a freestanding assessment tool that captures a participant's psychological symptom pattern for a specific point in time. The BSI contains 53 questions designed to rate the respondents distress from zero (not at all) to four (extremely). One scores the BSI on nine different symptom dimensions (Somatization, Obsessive Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism) and three global indices of distress (Global

Severity Index (GSI), Positive Symptom Total (PST), and Positive Symptom Distress Index (PSDI) (Derogatis, & Spencer, 1982).

While one cannot diagnosis someone based solely on a "point-in-time" assessment of symptoms, the tool provides a "broad-brush profile" of the participant's status. It also allows the tester to obtain a rather accurate picture of the symptomology happening in the moment (Derogatis, & Spencer, 1982, p. 32). The BSI has consistently shown to be both reliable and valid and researchers consistently utilize the BSI several study populations (Derogatis & Spencer, 1982; Rabkin et al., 1991; Johnson & Thorn, 1989; Baider et al. 1984; Atkinson, Kremer, & Ignelzi, 1982; Amenson & Lewinsohn, 1981; Stefanek, Derogatis, & Shaw, 1987; Katon, Von Korff, Lin, Lipscomb, Russo, Wagner, & Polk., 1990).

Procedures

Responses from the author-constructed survey were coded on scales of 1-5 based upon responses from the five point-Likert scale. Responses from open-ended questions were compiled and then responses were assigned a numeric code. All coded answers were then placed into a statistical database for analysis. The author gathered responses from the SCID-II and the BSI and provided the responses to a psychometric tester, two coders, and one statistician. The psychometrist converted the raw data into scores according to the instructions of the SCID-II and BSI manuals and interpreted the results. Coders took these scores, compiled them into a database, and cleaned the coding for statistical analysis. Lastly, the statistician, based upon the author's questions assisted the author in analyzing the results.

Questions from the SCID-II asked the participant about the kind of person they generally are (how they have usually felt or behaved over the past several years). Participants checked "Yes" if the question completely or mostly applied to them or "No" if it did not, if the participant

did not understand a question they responded "I Don't Know." Coders tallied all positive answers (Yes), and those totals were compared to the values indicating a threshold indicating a possible personality disorder (PD). If a total number met the threshold value for a PD, it indicated they were at threshold but might not necessarily qualify as *having* that diagnosis. If the participant's score was higher than threshold, coders tagged the participant *as having a possible diagnosis* for that particular PD, or a "diagnostic impression" for that PD. Some participants had multiple possible diagnoses and multiple thresholds for others. For example, the threshold for Avoidant Personality Disorder (APD) and Paranoid Personality Disorder (PPD) is a score of four; the threshold for Narcissistic Personality Disorder (NPD) is a five. If a participant scored a four for APD, and 7 for PPD and NPD, the result would be that the participant is at the threshold for APD (not necessarily qualifying as *having* that diagnosis), but would be tagged for a possible diagnosis of *both* PPD and NPD because their scores exceeded the threshold.

The ten official criteria and diagnoses of PDs in the updated Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-V) (2013) remain the same as earlier versions, but clinicians now have the option to use a diagnostic model rather than a categorical model to diagnose patients (Hoermann & Zupanick, 2013). Currently, this alternative is available as many clinicians argue that using a check off categorical model for personality diagnosis is like trying to fit a round peg into a square hole. Personalities vary, are multi-faceted, and continuous among individuals. Responses for the questions on the SCID-II are "yes," "no," or "I don't know" responses. All positive responses for a participant are totaled. Each PD has a "threshold" number, and if the participant's score exceeds that given threshold, a diagnosis and further, more in-depth testing would be indicated.

Responses for the BSI were converted from raw data into scores for the three global indices of distress according to the instructions of the BSI Manual (Derogatis, & Spencer, 1982). The Global Severity Index (GSI, overall distress) is the average of all of each participant's responses; the total sum divided by 53. The Positive Symptom Total (PST, the number of symptoms) is the total number of responses in which a participant responded anything other than zero, thus, it reflects the total number of symptoms they reported experiencing, regardless of the severity. Finally, the Positive Symptom Distress Index (PSDI, the intensity of symptoms) is the sum of all responses divided by the PST.

The nine dimensions (depression, anxiety, etc.) are also averages. Each is scored by getting the sum for that dimension's questions and then dividing by the number of questions in that dimension. Somatization, for example, has seven questions, thus seven then divides the summed responses to those questions. After this process, t-values are located for each of these scores. The scorer locates the raw score in the first column and then locates the corresponding t-value by going across the row to find the matching dimension. Additionally, see Appendix A for the definitions of the nine BSI Symptom Dimensions.

Results & Analysis

As stated earlier, the author explored four specific hypotheses. In addition to the four main hypotheses, the author presents other additional analysis that is noteworthy, as well as information regarding technician equipment (see full list of PPE in Appendix C).

Participant Demographic Data

Succinctly, of the 113 participants completing the author's self-constructed survey, all participants had climbed a telecommunications structure within the last five years. Of these participants, 106 (93.8%) were male, seven (6.2%) were female, 105 (92.9%) were Caucasian, four (3.5%) were Hispanic, and four (0.9%) were African American, Hawaiian Pacific, dual ethnicity, or multiple ethnicity respectively. Most technicians (26.5%) were aged 31-35 years of age. The next largest age groups of those surveyed were 36-40 (20.4%), 41-45 (18.6%), 26-30 (14.2%), 18-25 (8.8%), 46-50 (8%), 51-55 (2.7%), and 56-60 (0.9%), respectively.

Most participants obtained "Some College" (43.4%), while 17 (15%) obtained a college degree. An equal number of participants that had obtained "Some College" had obtained either a GED (14, 12.4%) or High School Diploma (25, 22.1%). Only eight participants (7.1%) reported dropping out of high school. An overwhelming majority of respondents (80.5%) reported being "athletic in nature" and reported knowing someone that was either injured or killed while on the job (62.8%).

Work Characteristics. Of the 113 respondents, the majority have been climbing 15 years or less (79, 69.9%), while only 18.6% (21) have climbed 16 or more years. Only 13 respondents have been in the industry longer than 20 years (11.5%). However, the majority of participants have climbed more than 200 times (89.4%). When comparing Instructors (59) and Technicians (54), there was a statistically reliable difference between the mean number years of experience that Instructors have ($M = 3.07$, $s = 1.375$) and the years of experience that Technicians have ($M = 2.09$, $s = 1.202$), $t(111) = 3.997$, $p = .000$, $\alpha = .05$. Put another way, there was a statistically significant difference in the experience of those in the instructor category as compared to the technician category; instructors had more experience. Work characteristics are available in Tables 7-8, and t-test results are in Table 9.

PPE. Personal protection equipment (PPE) is mandated by OSHA (OSHA, 2015), and essential to keep telecommunication technicians safe as they perform the various duties of their job. While working at heights, maintaining "tie-off," (remaining secured to the tower to prevent falling), and proper use of the equipment is the responsibility of the technician. The majority of fatalities evidences this in the past 31 years as most are directly attributed to technician error, improper use of PPE, or failure of its use (73.85%) (Hester, 2014). Responses from participants reveal that the respondents are aware not only of the functionality equipment provides, but that they are overwhelmingly in favor of its use in the field because they feel it does keep them safer at work (91.2%).

Questions presented in the self-constructed survey were in a Five-Point Likert scale; from "Completely Agree," "Agree Somewhat," "Neutral," "Disagree Somewhat," and "Completely Disagree." For purposes of analysis, these responses were recoded as "Agree," "Disagree," or Neutral." Respondents agreed that proper use of their equipment was helpful, kept them safe and less likely from falling while ascending, descending, remaining stationary, or moving laterally. Additionally, technicians reported that the equipment kept them the safest and had the least likely chance of falling once they reached the place they would be working after they ascended the tower.

In relation to the equipment itself, most technicians reported that the equipment they used did not hinder their ability to execute job duties, was not overly burdensome or too heavy for the job performed, or made their job more dangerous. There were however, an equal number of technicians that reported equipment making the completion of tasks slower and the number of technicians that said the equipment did not slow job execution. Technicians did report falling both while wearing (40.7%) and not wearing their PPE (10.6%), and the majority of technicians

agreed that wearing the PPE has saved them from falling (67.3%). See table 11 and 12 for respondent answers regarding equipment.

Hypothesis One: Technician / Instructor Perception

One might expect a difference between technicians and instructors in terms of their perceptions of safety. From this author's experiences with reported cases of inexperienced and untrained technicians in the field, this expectation seemed worth exploring. Researchers analyzed Hypothesis 1 using an independent samples t-test. Surprisingly, there were no statistically significant differences between technicians and instructors in regards to perceptions of PPE use, $t(111) = -.11$, $p = .91$, perceptions of free climbing, $t(111) = -.43$, $p = .67$, or perceptions of deadlines, $t(111) = -.11$, $p = .91$.

Hypothesis Two: Witnessing Injuries/Fatalities, PPE, Free Climbing, & Deadlines.

Witnessing Injuries/Fatalities.

PPE. Concerning hypothesis two, one might presume that witnessing an injury or a fatality while on the job site would present a significant difference in a technician's feelings or perceptions of the use of their PPE. It is reasonable to assume that a technician would have positive feelings about the use of their PPE in light of having witnessed an injury or personally knew someone that had killed on the job. Results were contradictory from what researchers expected to find; analysis using an independent samples t-test, showed a significant difference $t(111) = -2.42$, $p = .02$. Surprisingly, technicians who witnessed an *injury* had *less positive* feelings toward PPE use ($M = 3.93$) than those who had not witnessed an injury ($M = 4.11$). Additionally, there was no difference between the perceptions of PPE use by those who knew someone who had been killed on the job and those who did not know someone who had been killed on the job, $t(111) = -.57$, $p = .57$. Based on results, one possible implication is that those

who had known someone injured on the job (M = 2.22) had a more positive view towards free climbing than those who had not (M = 1.91). This result was a counter intuitive result.

Free Climbing. In regard to free climbing, there was no significant difference between the perceptions of free climbing by those who witnessed an injury and by those who had not witnessed an injury, $t(111) = .33$, $p = .74$. However, additional analyses on this particular topic demonstrated three significant differences were apparent. First, there was a significant difference between the perceptions of PPE use by those who free climbed in the past versus those who had not, $t(108) = 2.00$, $p = .048$. Those who free climbed in the past had less positive feelings toward PPE use ($M = 3.96$) than those who had not ($M = 4.11$). Not only did those technicians have less positive feelings about their PPE, $t(108) = -10.59$, $p < .001$ they also had more positive feelings about the act of free climbing itself ($M = 2.51$) than those who had not free climbed ($M = 1.35$).

Lastly, there was also a significant difference between the perceptions of free climbing by those who knew someone who had been killed on the job and those who did not know someone who had been killed on the job, $t(111) = 2.11$, $p = .04$. Put more plainly, those technicians who knew someone killed on the job also felt that deadlines negatively affected their (personal) ability to work. To clarify, the analyses about free climbers and witnessing a fatality were two completely separate analyses. Free climbing and knowing someone who suffered a fatality are not connected; both groups just happened to have higher deadline perception scores. The connection between knowing someone killed on the job and the perception that deadlines may or may not have played in the known fatality require further investigation in a more qualitative study.

Deadlines. There was no significant difference in the perceptions of deadlines between those who witnessed an injury versus those who had not did not, $t(111) = 1.58$, $p = .12$. However, further investigation did reveal a significant differences in the perceptions of deadlines by those who knew someone killed on the job, $t(111) = 2.44$, $p = .02$, and the perception of a negative impact of deadlines by those that reported free climbing, $t(108) = -3.40$, $p = .001$. Concisely, higher scores on the deadlines questions indicate that the respondent believed that deadlines have a significant impact on their work (specifically, the questions reference aspects such as: using or not using equipment, not tying off, deadlines being unreasonable, etc.). Those who free climbed in the past believed deadlines had more of a negative impact on their job ($M = 2.33$) than those who had not free climbed in the past ($M = 1.88$).

However, given the results, it is not likely there is a direct connection between high scores on questions regarding deadlines and the person believing that those deadlines were the *cause* of a fatality. Until a more detailed qualitative investigation can be completed, it might be fairer to interpret the results in such a way that technicians who knew a deceased technician also felt that deadlines negatively affected them personally.

Hypothesis Three: Worker Education, Experience, & Age

It is reasonable to assume a technician with a higher level of education (assuming astute cognitive functioning), more years of experience, and more climbs, would possess more efficient safety awareness. Analysis using Pearson's r correlation coefficient indicated there were two positive correlations in regard to free climbing, and one negative correlation to PPE use, and education, experience, and age. First, analysis revealed no relationship between age and perceptions of safety equipment use, $r(113) = -.10$, $p = .273$, between age and perceptions of free climbing, $r(113) = .07$, $p = .432$, or between age and perceptions of deadlines $r(113) = .01$, $p =$

.948. There was however, one weak negative relationship between education and perceptions of PPE use, $r(113) = -.23$, $p = .02$ and two weak positive correlations between years spent climbing and perceptions of free climbing, $r(113) = .30$, $p = .002$, and between number of times climbed and perceptions of free climbing, $r(113) = .20$, $p = .03$.

Concisely, the one negative and two positive correlations suggest that technicians that have a lower level of education have a slightly more favorable view of PPE than those with a more advanced education, and those technicians that have more years' experience climbing and more occurrences of climbs hold a more slightly more favorable view of free climbing. Because the correlations are weak in nature, one must also consider that there is the possibility that are other mitigating variable(s) that influenced the results, which will be discussed in the discussion portion of this paper.

Hypothesis Four: Mental Health

The fourth hypothesis asserted that there is a difference between technicians and instructors in regards to mental health as assessed by the SCID-II and the BSI.

SCID II. Of the 113 participants, only 88 completed the SCID-II assessment in its totality, thus the author excluded the remaining 25 participant cases for this specific analysis.

In examining the chart, one can see that a rather large percentage of technicians exceeded the threshold for paranoid, narcissistic, antisocial, and borderline personality PDs (Definitions for the ten official personality disorders (APA, 2013) are in appendix B). Because of the negative stigma attached to mental health disorders (NAMI, n.d.; Davey, 2013), individuals may be resistant to testing or diagnosis of a PD. It should be noted that the presence of a PD does not necessarily mean that an individual is any less intelligent, less capable, or less likely to be a profoundly effective worker, but research has indicated that mental health issues *can effect*

ability to perform, relationships, and cognitive processing (Boss, 2000; Roberts & Levinson, 2001; Crouter, Bumpas, Head, & McHale, 2001).

The analysis produced several interesting results. Testing rendered high percentages of participants above the threshold limit in relation to three personality disorders: paranoid personality disorder (71.6%), narcissistic personality disorder (53.4%), and antisocial personality disorder (45.4%) respectively. All other personality disorders rendered a smaller percentage of participants above threshold. These include borderline personality disorder (35.2%), schizotypal personality disorder (17.1%), passive aggressive personality disorder (13.6%), schizoid personality disorder (10.2%), depressive personality disorder (9.1%), and histrionic personality (6.8%). One should not assume that these disorders are present in participants as a diagnosed personality disorder from the results of the testing in this study. Again, the tool was utilized as a rough assessment tool. For a comprehensive diagnosis, respondents should retake the SCID-II in conjunction with an in-depth interview with a clinician. A percentage breakdown of participant thresholds are available in Table 10.

When comparing technicians to instructors there were three notable findings worth reporting. Among all nine personality disorders addressed, instructors more often met the threshold for passive aggressive personality disorder, $\chi^2(1, N = 88) = 5.37$, $p = .02$, depressive personality disorder, $\chi^2(1, N = 88) = 8.03$, $p = .005$, and borderline personality disorder, $\chi^2(1, N = 88) = 4.59$, $p = .032$. There were no significant differences between the two groups for the remaining six disorders. Of the three where the difference was significant, the most significant was depressive personality disorder, followed by passive aggressive, with antisocial as the least significant.

BSI. Of the 113 participants, only 107 completed the BSI assessment in its totality, thus the author excluded the remaining six participant cases. As a reminder, the BSI is freestanding assessment tool that captures a participant's psychological symptom pattern of distress for a specific point in time. While one cannot just use the tool to diagnose, the BSI does provide early information that may help distinguish one disorder or syndrome from another. The BSI has three indices of measurement, the Global Severity Index (overall distress measurement), Positive Symptom Total (number of symptoms), and the Positive Symptom Distress (intensity of self-reported symptoms) (Derogatis, & Spencer, 1982).

Utilizing Pearson's r correlation coefficient, Point-Biserial correlation coefficient, and regression analysis, the BSI mental health assessment results indicated there was one positive correlation between the BSI Global Severity Index and perceptions of PPE use, $r(105) = .20$, $p = .04$. However, there were no correlations between the BSI Global Severity Index and perceptions of free climbing, $r(105) = -.02$, $p = .81$, or perceptions of deadlines, $r(105) = -.10$, $p = .31$. There was also no correlation between the BSI Positive Symptom Total and perceptions of PPE use, $r(105) = .12$, $p = .04$, free climbing $r(105) = .20$, $p = .23$, and deadlines $r(105) = -.08$, $p = .40$. Lastly, there was no correlation between the BSI Positive Symptom Distress Index and perceptions of PPE use, $r(105) = .17$, $p = .08$, free climbing $r(105) = -.07$, $p = .50$, and deadlines $r(105) = -.07$, $p = .50$

Concisely, this result indicates, that only one factor, that is, perceptions of PPE use, had a positive relationship with the distress levels, their intensity, and number of symptoms measured by the BSI by the participants in this study across only one distress index. The other factors, free climbing and perceptions of deadlines, did not have such a correlation. Furthermore, both the

BSI Positive Symptom and BSI Positive Symptom Distress indices showed no correlation with any of the three factors, perceptions of PPE, of free climbing, or deadlines.

When comparing technician and instructor BSI responses, analysis revealed no statistically significant differences between instructors and technicians concerning any of the three indices. Thus, there was no difference between instructors' (M=61.14) and technicians' (M=60.33) overall distress measurement, $t(111) = .231$, $p = .827$, number of symptoms, $t(111) = .488$, $p = .626$, or intensity of self-reported symptoms, , $t(111) = .889$, $p = .637$. Practically, this would imply that instructors and technicians indices scores indicated they reported approximately the same levels of overall distress, intensity, and number of symptoms.

Interpretation of Findings

These findings are a baseline for further study, as this author is unaware of any similar research regarding climber perceptions or mental health within the telecommunications industry specifically. The descriptive information pulled from surveys does indicate that several variables in the additional analysis were significant. Collectively, the findings in this study are not surprising to the author, but more research will be required to delineate more information, especially in regards to free climbing and mental health. Overall, one might conclude that workers within the telecommunications industry reflect an average demographic of one's idea of the American blue-collar worker in a high-risk occupation. Most are educated, white, male, and athletic, with quite a number of years' experience. Most believe their PPE is a protective element that assists in keeping them safe while they execute their jobs. Oddly, however, there was no statistically significant difference between instructors and technicians in regards to the perceptions of PPE keeping them safe, free climbing, or perceptions of deadlines. One might reasonably anticipate a profound difference in these particular areas, especially when comparing

technicians, and those that instruct others in safety. As explored earlier, there was some distinguishable and interesting additional analysis, which we explore in the discussion section.

Discussion

Overall, most technicians have climbed over 200 times and have been working in telecommunications for 15 years or less, and those that are instructors within the parameters of this study, have more experience. Furthermore, as anticipated, most of those participants surveyed believed their PPE are valuable tools that keep them safe in the execution of their work, but a rough half-and-half split of workers felt the equipment slowed their ability to complete their job and those that did not. All of these findings were congruent with what this author expected given the professional interactions with technicians over the last several years, the limited sample size, and the recruitment method.

Free Climbing

The operational definition of this author and other advocates in the industry (Reardon, 2014), free climbing occurs when a technician is not utilizing 100% tie off as dictated by the industry. Put more plainly, free climbing is 1) when a technician is ascending or descending a tower without the use of lanyards, safety climbs, or other approved methods, 2) moving laterally on the tower while performing the functions of the job without being 100% tied off, or 3) riding the "gin pole," "load line," or "headache ball." **S**tatistically, there were no significant changes in the number of fatalities from 1984 through 1998 as compared to 1999 through 2013 ($t=0.576$). Furthermore, most fatalities, 71.52%, have been a direct result of free climbing, climber error, or unsafe practices (riding the gin pole, load line, headache ball, etc.) (Hester, 2014); all of which could be categorically construed as "free climbing," given the definition presented.

Because of the safety initiatives within the industry since the late 1990's, those that continue to be put in place, and a rather unsettling death toll per year since 1984, a reasonable person would expect that technicians would have disdain for a practice such as free climbing. However, some eye-opening and counter intuitive results emerged. For instance, those that had free climbed in the past actually had a *less* positive perception of their PPE and a *more* positive perception about free climbing even if they had known someone killed at work. This would logically indicate that those that responded affirmatively to free climbing, even in the above-described circumstances, might be more apt to free climb if given the opportunity.

This raises some concerns. One can reasonably assume from this information that free climbing will continue as a practice. First, while technicians that have free climbed may be naturally eliminated from the industry due to age or some other circumstance, the practice of free climbing is actively passed on to new generations of technicians despite OSHA and industry regulations. Secondly, because of the transient nature of the industry, free climbing is largely an unchecked issue, as it is unfeasible to audit each location, and again, this is likely to perpetuate free climbing. Lastly, it has been reported to this researcher by technicians that it is common for foremen and company owners to at a minimum, ignore free climbing, and at worst, encourage the practice in order to complete jobs. This area is important for further research, because it may also contribute to technicians' perceptions and practice of free climbing. Not only does this have implications regarding a technician's' judgment (whether or not to refuse to free climb), but it also calls into question the safety culture within this subcontracting paradigm, which also requires further investigation.

Deadlines

Similar to free climbing, the author did not gain results as put forth in the hypothesis, but the finding that technicians who knew a deceased technician might have felt deadlines negatively affected them personally is worth discussing. It is also possible that one's personal abilities will suffer upon learning of a loss of someone the technician knew. It is entirely within the realm of possibility that such a loss could negatively affect a technician's mental health, mood, or concentration levels. One might conclude that as a rather ambiguous finding, as there are a myriad of mitigating factors that could influence a worker. However, deadlines remain a concern to this author as many technicians have reported concerns about pressurized deadlines in correspondence, on social media, and in various industry meetings.

Mental Health Tools

According to Hoermann, Zupanick & Dombeck (n.d.), Personality Disorders (PD) have four defining features. These features include distorted thinking patterns, problematic emotional responses, impulse control that is over or under-regulated and interpersonal difficulties. Additionally, anyone can exhibit these personality traits periodically through their lives. However, to qualify as a personality disorder the traits must be rigid, inflexible, cause functional impairment, subjective distress (symptoms are harmful, painful, unwanted, embarrassing, or cause significant distress). Because of these guidelines, it is important to reiterate that this current study only utilized the SCID-II as a *rough assessment tool*. This researcher or any clinical psychometric professional could make no definitive conclusions about any participant's individual mental health without an exhaustive follow up and further assessment.

The differences between technicians and instructors are not surprising, and reinforce this author's assertion that mental health issues negatively affect workers. Concerning the SCID-II

analysis, more instructors as compared to technicians met or exceeded the threshold for passive aggressive personality disorder, depressive personality disorder, and borderline personality disorder. The practical concern here is because PDs have the ability to effect thinking patterns, emotional responses, impulse control, and interpersonal difficulties; it is conceivable that those PDs, if present, could potentially affect one's ability to train others. That is not to imply that a person diagnosed with one of the PDs are incapable of training, or should not train others, but it does highlight the need for employers to be more conscience of worker mental health and provide positive and inviting workplaces where employees do not fear coming to management with potential mental health concerns.

About the BSI results, it is important to remember that the BSI only measures distress in a point in time manner. Overall distress, and number or intensity of symptoms is likely to vary from one point in time to another. For instance, one might expect these indices to be lower in times of steady work, good health, healthy interpersonal relationships, and positive work environments. Conversely, one might expect there to be a heighted level of these same indices in times stress or times of pressure to perform at work or at home.

Acceptance versus Complacency

One of the more interesting findings of this study was 91.2% of participants indicated that they were overwhelmingly in favor of PPE in the field because they feel it does keep them safer at work. However, findings also indicated that technicians who witnessed an *injury* had *less positive* feelings toward PPE, and a more positive outlook on free climbing. However, there was no difference in his or her perceptions of PPE by those who knew someone who had been killed on the job. Either there was a misunderstanding of the survey questions, an issue of responder bias, or there is a deeper, more meaningful reason for the results.

One of many possibilities is that respondents perceive PPE differently in some regard within the contexts of injury versus fatality. Another reason is an acceptance of industry's safety culture. Behavior studies and theories tend to focus on the ground level workers' risky behaviors, decision making, or complacency in relation accidents, injuries, and fatalities. While these are all valid factors as indicated by research, it would be beneficial to explore the caveat of acceptance to specific safety culture of the telecommunications industry. In other words, it seems important to determine if workers become complacent in decisions and actions after a number of years in the same occupation, or if they accepting of the industry safety culture (a remaining acceptance of free climbing – at least in the field).

Future Research Endeavors

As mentioned in the sections above, possible mitigating variables should be included in further research. Such research will be able to delineate the degree to which these variables affect the physical, job-related, and mental health well-being of telecommunications workers. Among the most pressing areas of concern would include in-depth qualitative exploration regarding mental health, specifically as it relates to Axis II disorders, relationships among PPE and free climbing, and free climbing and deadline perceptions. Other areas that would be of particular interest include a comparison on the issues presented in this study between employers and technicians, and a more in depth qualitative mental health study workers of all positions that work in the field. Because instructors more often met the threshold for depressive disorder, it would be valuable to determine which variables may be responsible for this (i.e. personal relationships/issues, stress of being responsible for training others, worries related to placing men and women they have sent into the industry, etc…).

Similarly, two other, more narrowed studies may prove valuable. A study on supervisors specifically would be informative. Foremen are essentially the representative of the employer on worksites and in that capacity. Given that position, it would be worth exploring the specific stressors that are inherent in the position and its direct and indirect effect on crew management in the field and its effects on the mental health of those holding the position of foremen. Additionally, a second study on acceptance versus complacency as noted in the discussion would be incredibly valuable as it relates to free climbing and PPE.

Limitations

Data, Power, and Type II Error

All of the data for this article *are exploratory* in nature, and due to the limited sample obtained, there is the possibility of a type II error. After eliminating participants for missing data, the sample size was smaller than anticipated, thus the power for analysis was lower than desired. This might have resulted in an effect actually being present that did not emerge in the results. This does not mean that the analysis is void or unimportant; it simply means that it is advisable to replicate the study to obtain a larger sample size.

Self-Reporting

The information contained herein is a direct result of completed self-report tools. When using self-report measures it is possible that the researcher will encounter responder bias, or obtaining answers on surveys that the respondent believes the researcher would like to have rather than providing the most accurate information possible. This can happen for a multitude of reasons including wanting to appear compliant for the study, not fully understanding what is being asked, having a misperception of what the researcher is seeking to learn, stress, or distraction. These types of tools have the potential to damage the validity of a measure or study.

However, surveys that have a high level of response bias still often have high reliability. This can make it difficult to interpret results thus, the researcher had to be cognizant of the response bias could produce a false sense of security about the conclusions. Again, response bias does not invalidate the findings; rather it is a possible mitigating factor.

Population of Technicians

Telecommunication technicians are a specialized workforce with a small number of workers as compared to other industries such as construction. While technicians perform construction of a variety of towers, they are also responsible for decommission of towers, maintenance, and installation of equipment. There has been a wide range of estimates as to the number of actual technicians within telecommunications. In 2010, when this author first became involved, the accepted industry estimate was approximately 9,800 workers (Luketis, 2015). However, as of 2015, Wireless Estimator (WE), an industry news source, commissioned a report that estimated as many as 29,000 workers (the article is accessible here) are employed within telecommunications.

WE indicated, "previous counts were mostly guesswork" (2015), and that the 2015 study indicates a more accurate count. However, WE also stated that the most recent study "also faced several challenges that might modify the total" (Luketis, 2015). These might include inaccurate reporting on the part of the employer (both the WE and/or the Bureau of Labor statistics (BLS)) and a hiring influx during the industry build out for 4G. Additional constraints with WE's total may also include the fact that numerous companies do not have an internet presence (a requirement for the database utilized in the WE study), an untold number of technicians working as 1099 contractors versus permanent employees of a company, and an unknown "quantity of municipal and utility company tower technicians." As Jonathan Adelstein, CEO of PCIA – The

Wireless Infrastructure Association stated in 2014 regarding the population total of telecommunication technicians, “the number has always remained a moving target” (Luketis, 2015; OSHA, 2014).

When looking at the number of workers from a strictly academic perspective, one would estimate the number of workers as reported by the BLS. The BLS assigns NAICS codes to businesses to define establishments, and Standard Occupational Classification (SOC) codes to define job or work performed descriptions of people working for those businesses. The SOC codes are used to accurately code workers given their job descriptions for a variety of reasons including pricing for worker’s compensation insurance. Other uses include administrative, contracting, and tax purposes (L., Christine, 2011). According to the Small Business Administration (L.C., 2011), “some state governments offer tax incentives to businesses from specific NAICS industries. Some contracting authorities also require NAICS codes to determine eligibility to bid on contracts” (2011, para.6-7).

In this author’s opinion, from a statistical standpoint, BLS statistics are the most effective and accurate manner in which to get an appropriate estimate of the number of telecommunication technicians. However, because not all employers assign a code, and in some cases do not assign an appropriate code, an accurate count of workers is as Jonathan Adelstein stated, “a moving target.” From the challenges explained here, the newest estimate from WE is more likely to be accurate than the estimate from their previous study in 2006. However, it is this author’s opinion that it is unlikely, statistically, that the 29,000-worker estimate is perfectly accurate. In fact, it is unlikely that the industry will ever be able to establish an official number of workers unless a definitive method can be utilized to capture all of the appropriate data.

Study Sample

As mentioned in previously, gathering participants was challenging for this study. Not only with the uncertainty of estimating the total population, but also because of the logistics involved with recruiting participants. Based on a casual preliminary inquiry in 2014, this author found that it was common for telecommunication technicians to travel upwards of 300 days per year. Given the transient nature of the industry, not all technicians are involved in social media, visit the same websites, or read the same materials where the author recruited, it was difficult in achieving a full study sample for this research (see the procedures and data collection sections of this paper for references on statistical power and effect sizes).

Mental Health Assessment Tools

In addition to the aforementioned limitations, executions of the mental health assessment tools were also a challenge. To understand each test, the author provides a brief description. Both the SCID-II and the BSI have shown through numerous peer-reviewed studies over the past two decades to be both reliable and valid. Both tools are only *rough assessments* and in an ideal situation, participants would take these assessments and then follow up with a one on one interview with a professional clinician. Ideally, the SCID-II, should be given as a follow up to the SCID-I, which measures a wide range of clinical disorders. While this author is not a clinician, she does maintain the education to give and score the assessments. However, time and logistics would not permit this; thus, both tests were integrated into the online survey mentioned earlier, and sent to a psychometrist for scoring. The author then compiled the data into the database. It should also be notes that even though this current study is only using very broad-sweeping assessments regarding mental health, the importance of mental health in the workplace is imperative and merits future research.

Conclusion

While there are limitations within this study, there was insight gained about the perceptions of the technicians of telecommunications, and this study, as with any investigation, has illuminated more questions for exploration. As this is the first study specifically examining the ground level workers within telecommunications, it does provide a springboard for further research. When examining human perceptions, psychology, and opinions, researchers are rarely able to come to inescapable conclusions. However, exposing layers into the psyche of the American telecommunications worker is vital. Telecommunications will not only continue to exist, it will thrive, as it is the lifeblood of not only the U.S. economy, but the global economy as well. Ensuring that workers' insights are explored and intrinsically understood will develop a safer workplace and reduce not only cost and increase profits, but also most importantly, injuries and fatalities.

Appendix A

SCID-II Definitions

Avoidant Personality Disorder: A pervasive pattern of social inhibition, feelings of inadequacy, and hypersensitivity to negative evaluation, beginning by early adulthood and present in a variety of contexts, as indicated by four or more of the [revised criteria].

Dependent Personality Disorder: A pervasive and excessive need to be taken care of that leads to submissive and clinging behavior and fears of separation, beginning by early adulthood and present in a variety of contexts, as indicated by five (or more) of the [revised criteria].

Obsessive-Compulsive Personality Disorder: A pervasive pattern of preoccupation with orderliness, perfectionism, and mental and interpersonal control, at the expense of flexibility, openness, and efficiency, beginning by early adulthood and present in a variety of contexts, as indicated by four or more of the [revised criteria].

Passive-Aggressive Personality Disorder: A pervasive pattern of negativistic attitudes and passive resistance to demands for adequate performance, beginning by early adulthood and present in various contexts, indicated by at least four of the [revised criteria].

Depressive Personality Disorder: A persistent and pervasive pattern of depressive cognitions and behaviors, such as chronic unhappiness, low self-esteem, pessimism, critical and derogatory attitudes toward oneself and others, feelings of guilt or remorse, and an inability to relax or feel enjoyment, indicated by at least four of the [revised criteria].

Paranoid Personality Disorder: A pervasive distrust and suspiciousness of others such that their motives are interpreted as malevolent, beginning by early adulthood and present in a variety of contexts, as indicated by four (or more) of the [revised criteria].

Schizotypal Personality Disorder: A pervasive pattern of social and interpersonal deficits marked by acute discomfort with, and reduced capacity for, close relationships as well as by cognitive or perceptual distortions and eccentricities of behavior, beginning by early adulthood and present in a variety of contexts, as indicated by five (or more) of the [revised criteria].

Schizoid Personality Disorder: A pervasive pattern of detachment from social relationships and a restricted range of expression of emotions in interpersonal settings, beginning by early adulthood and present in a variety of contexts, as indicated by four (or more) of the [revised criteria].

Histrionic Personality Disorder: A pervasive pattern of excessive emotionality and attention seeking, beginning by early adulthood and present in a variety of contexts, as indicated by five (or more) of the [revised criteria].

Narcissistic Personality Disorder: A pervasive pattern of grandiosity (in fantasy or behavior), need for admiration, and lack of empathy, beginning by early adulthood and present in a variety of contexts, as indicated by five (or more) of the [revised criteria].

Borderline Personality Disorder: A pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity beginning by early adulthood and present in a variety of contexts, as indicated by five of the [revised criteria].

Antisocial Personality Disorder: There is a pervasive pattern of disregard for and violation of the rights of others occurring since age 15 years, as indicated by three (or more) of the [revised criteria]. having hurt, mistreated, or stolen from another.

Appendix B

BSI Symptom Dimensions

Somatization (SOM): Reflects distress arising from perceptions of bodily dysfunction. Complaints focus on cardiovascular, gastrointestinal, respiratory, neurological, and other systems with strong, autonomic mediation. Pain and discomfort of the gross musculature and other somatic equivalents of anxiety are also possible components of Somatization.

Obsessive-Compulsive (O-C): This measure focuses on thoughts, impulses, and actions that are experienced as irresistible and unremitting and that are of an ego-alien or unwanted nature. Behavior and experiences reflecting a more general cognitive performance deficit also contribute to this measure.

Interpersonal Sensitivity (I-S): The Interpersonal Sensitivity measure focuses on feelings of inadequacy and inferiority, particularly in comparison to other people. Self-deprecation, self-doubt, and marked discomfort during interpersonal interactions are characteristic manifestations of this syndrome. Self-consciousness and negative expectations about interpersonal relations are hallmark features of I-S.

Depression (DEP): The Depression dimension reflects a representative range of the manifestations of clinical depression. It comprises symptoms of dysphoric mood and affect, signs of withdrawal of life interest, lack of motivation and loss of vital energy. Feelings of hopelessness, thoughts of suicide and other cognitive and somatic correlates of clinical depression are included in this measure.

Anxiety (ANX): General signs of anxiety such as nervousness, tension, and trembling are included in the domain definition, as are feelings of apprehension, dread, terror, and panic. In addition, some somatic manifestations of anxiety are also reflected in the domain.

Hostility (HOS): The symptoms of the Hostility dimension include thoughts, feelings, and actions that are characteristic of the negative affect state of anger. Items reflect all three modalities of expression, and demonstrate qualities such as resentment, irritability, aggression, and rage.

Phobic Anxiety (PHOB): The Phobic Anxiety dimension defines the syndrome as a persistent fear response to a specific person, place, object, or situation, which is disproportionate to any actual threat, and leads to avoidance or escape behavior. Items overlap highly with DSM-IV Agoraphobia syndrome.

Paranoid Ideation (APR): The Paranoid Ideation dimension represents paranoid behavior as fundamentally a disordered mode of thinking. The Items comprising P-I reflect the cardinal clinical features of projective thought, hostility, grandiosity, suspiciousness, entrality, and fear of loss of autonomy.

Psychoticism (PSY): Psychoticism was designed to represent the construct as a continuous dimension, from a withdrawn isolated lifestyle at one pole to demonstrable psychotic behavior at the other. The measure attempts to reflect a graduated continuum from mild social alienation to first-rank symptoms of psychosis.

Appendix C

Survey List of Personal Protection Equipment (PPE)

This list of PPE is derived from responses to the open-ended questions. They are in no particular order:

"My least useful piece of equipment is my…"
"My most useful piece of equipment is my…" and
"The piece of equipment I find most cumbersome and difficult to use is…"

"Descender"
"Positioning Lanyard"
"Harness"
"Pelican Hooks"
"Self-Retracting Lanyard"
"All"
"None"
"Belt"
"Brain"
"Body"
"Whole PPE"
"Safety Climb"
"Chest Strap"
"Safety Capstan"
"Side Bags"
"D-Rings"
"Gloves"
"Rope Ascender"
"Boots"
"RF Monitor"
"Turf Demands"
"Training"
"Triple Action Carabiner"
"Chain of Command"
"Cable Grab"
"Etrier"
"Y-Lanyard"
"Hard Hat"
"Safety Glasses"
"Other"

If the respondent did not give information, its code was "Missing" and not included in analysis.

Table 1

Participant Ethnic Demographic Information

Ethnic Category	Number	Percentage (%)
White/Caucasian	105	92.9
Hispanic	4	3.5
African American	1	0.9
Hawaiian Pacific	1	0.9
Dual Ethnicity	1	0.9
Multiple Ethnicity	1	0.9

Table 2

Table for Gender

Category	Number	Percentage (%)
Male	106	93.8
Female	7	6.2

Table 3

Table for Age

Age	Frequency	Percentage (%)
18-25	10	8.8
26-30	16	14.2
31-35	30	26.5
36-40	23	20.4
41-45	21	18.6
46-50	9	8.0
51-55	3	2.7
56-60	1	0.9

Table 4

Table for Education

Category	Number	Percentage (%)
Dropout	8	7.1
Diploma	25	22.1
GED	14	12.4
Some College	49	43.4
College Grad	17	15.0

Table 5

Table for Athleticism

Category	Number	Percentage (%)
Athletic	91	80.5
Not Athletic	22	19.5

Table 6

Table for Knowing Injured or Deceased

Category	Number	Percentage (%)
Did Know	71	62.8
Did Not Know	42	37.2

Table 7

Work Characteristics - Years Climbing

Category	Number	Percentage (%)
0-15 years	79	69.9
16- 19 years	21	18.6
20+ years	13	11.5

Table 8

Work Characteristics - Number of Climbs

Category	Number	Percentage (%)
0-25	1	0.9
51-75	1	0.9
76-100	2	1.8
101-150	5	4.4
151-200	3	2.7
200+	101	89.4

Table 9

Results of t-test and Descriptive Statistics for Yrs. Experience by Position

	Position						95% CI for Mean Difference	
	Technician			Instructor				
	M	SD	n	M	SD	n	t	df
Yrs. Experience	2.09	1.202	54	3.07	1.375	59	3.997	111

Table 10

Participant Personality Disorder Thresholds

Personality Disorder	%Above	% Below
Paranoid	71.6	28.4
Narcissistic	53.4	46.6
Antisocial	45.4	54.6
Borderline Personality	35.2	64.8
Schizotypal	17.1	82.9
Passive Aggressive	13.6	86.4
Schizoid	10.2	89.8
Depressive	9.1	90.9
Histrionic	6.8	93.2

Table 11

PPE Responses – Helpful or Not Helpful

PPE	#	%	#	%
Helpful		71.6		28.4
Not Helpful		53.4		46.6

Table 12

PPE Responses

PPE	#	%
Slower	49	43.4
Not Slower	49	43.4
Safest @ Stationary	56	49.6
Least Likely to Fall Stationary	95	84.1

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