

Personality Trait Comparison of Pararescue Personnel and Elite Athletes

Anne Shadle; Lennie Waite; Wayne Chappelle

- INTRODUCTION:** Pararescue personnel (PJs) deploy in high-risk environments and perform extraordinary missions under intense conditions, requiring an unusual combination of physical and psychological abilities. The rigorous nature of PJ training and the superior levels of fitness and cognitive functioning to perform challenging physical feats in high-pressure, high-intensity environments have prompted military commanders and embedded health care providers to compare successful performance in the PJ mission with the characteristics required of elite, Olympic-level athletes.
- METHODS:** In the current study, we tested this assumption by comparing the social, emotional, and behavioral functioning of 160 U.S. PJ training candidate graduates and 73 elite, Olympic-level track and field athletes using scores on the NEO Personality Inventory-3.
- RESULTS:** Results from this study suggest that although there are physical and psychological challenges inherent in both the PJ and elite athlete career fields, the emotional, social, and behavioral performance of PJs differs in functional ways from the elite athlete population, with PJs scoring significantly lower in Neuroticism and higher in Extraversion and Conscientiousness.
- DISCUSSION:** The results of this study can be used to improve the delivery of embedded mental health services geared toward improving training and enhancing health, recovery, and performance within operational units.
- KEYWORDS:** pararescue personnel, elite athletes, personality traits, performance enhancement.

Shadle A, Waite L, Chappelle W. *Personality trait comparison of pararescue personnel and elite athletes*. *Aerosp Med Hum Perform*. 2022; 93(11):783–790.

Throughout history, United States Air Force (USAF) pararescue personnel (PJs) have made an immeasurable impact on both military and civil operations. Their exceptional skills in combat search and rescue (CSAR) and trauma medicine provide a distinctive capability for the USAF. The primary duties of a PJ include the ability to deploy in a rapid fashion into friendly, denied, or hostile territories across diverse geographic regions—mountain, desert, arctic, urban, and water—to extract, treat, stabilize, and rescue injured, wounded, isolated, or captured military and civilian personnel. The demands to perform such extraordinary missions require an unusual combination of physical and psychological abilities. Their motto, “That Others May Live,” is the cornerstone of their work and affirms their commitment to not only their self-sacrifice but also their commitment to saving human lives.

Given the rigorous nature of PJ training and CSAR operations, superior levels of physical and psychological aptitudes are essential to adapting to the various stressors and conditions

of operational missions. For example, research regarding physical traits of PJs reveals they must meet exceptional levels of fitness and health standards well above the traditional requirements that most military personnel must demonstrate.⁴ Additionally, they possess cognitive (i.e., speed and accuracy of information processing in various visual- and verbal-based aptitudes) abilities that are in the superior range of functioning, well above most military personnel. Further, research assessing personality traits (i.e., a stable and enduring pattern of emotional, social, and behavioral functioning across time

From the U.S. Air Force School of Aerospace Medicine, Wright-Patterson AFB, Dayton, OH.

This manuscript was received for review in March 2022. It was accepted for publication in September 2022.

Address correspondence to Lennie Waite, Ph.D., 1617 Kipling St., Houston, TX 77006; lenniewaite@gmail.com.

Reprint and copyright © by the Aerospace Medical Association, Alexandria, VA.

DOI: <https://doi.org/10.3357/AMHP.6087.2022>

and settings) reveals that PJs, as a group, when compared with adult peers in the civilian population, are: 1) emotionally less susceptible to experiencing negative emotions, such as fear, worry, apprehension, anger, irritability, sadness, and hopelessness, while simultaneously experiencing higher levels of general stress tolerance, optimism, and happiness; 2) socially higher in levels of self-regard, humility and modesty, gregariousness, assertiveness, interpersonal warmth, altruism, compliance in groups, and interest in forming close interpersonal relationships with others; and 3) behaviorally higher in levels of achievement-striving, dutifulness, flexibility, self-actualization, independence, and impulse control (Chappelle WL, McDonald K, Thompson W. Technical Report No. AFRL-SA-WP-TR-2012-0005; 2012. Available to those with access).^{3,4} It is not surprising such traits are consistent with research regarding the importance of emotional “hardiness” in predicting career success for U.S. special operations military personnel.^{1,2,14}

When considering the contributing factors to successfully completing the PJ mission, psychological parallels have been drawn between successful performance in combat scenarios and elite performance at the highest level in sporting arenas.^{7,16} Both elite athletes and PJs are required to sustain superior levels of fitness and cognitive functioning to perform challenging physical feats in high-pressure, high-intensity environments to achieve victory. Due to these shared characteristics, programming for military personnel is often designed around sport psychology interventions used with elite athletes. For example, studies have investigated the impact of mental skills training programs on performance and stress outcomes for military populations,^{5,9} a mindfulness intervention for a military helicopter unit,¹² and the integration of psychological skills training programs during various phases of military training.^{11,13,15} Specifically, Meyer¹³ studied the impact of a 6-wk sport psychology training program for soldiers and reported that 91% of the participants recognized the importance of the sport psychology skills for Army tasks, such as weapons qualification and combat medic tasks. Overall, the perceived similarities in functioning and high demand performance requirements between PJs and elite athletes have persuaded many military commanders and embedded mental health providers that there are significant similarities in the emotional, social, and behavioral functioning between these two groups.⁶

Although there are enticing, surface-level similarities between the two groups, it is unclear whether these perceptions of overlapping emotional, social, and behavioral traits are correct, given there are no empirically based, objective studies that support this perception. The subjective assumptions about the similarities between PJs and elite athletes are likely based on the high level of physicality, resilience, and mental toughness often noted as prerequisites for success in both communities. Further, the authors’ experiences of consulting with USAF line and medical leadership reveal a diverse range of opinions regarding areas of social, emotional, and behavioral functioning that delineate PJs from elite athletes. In sum, there appears to be a lack of consensus between leadership regarding areas of functioning that PJs display that are consistent with elite and Olympic-level

athletes, as well as a lack of objective, empirical data driven studies to support the perceptions regarding the perceived similarities in functioning between PJs and elite athletes.

While elite and Olympic-level athletes perform in large stadiums with cameras following their every movement and millions of fans watching, PJs are performing while their own life is at risk (i.e., under fire, attack). An athlete might step into the competitive battleground like an Olympic stadium, but that is different than a PJ in a Blackhawk helicopter that is flying 15.24 m (50 ft) above the ground, performing banking maneuvers, and under combat fire during a rescue mission that poses risk of significant life-threatening injuries. Considering this description, it is likely the social, emotional, and behavioral traits for successfully adapting and performing under battle-field rescue missions may potentially exceed or be quite different from those who compete in elite athletic events. Combat operations are performed under more highly intense, unexpected, uncontrolled conditions than competitive athletics events in which environmental safety and predictable scheduling are prioritized. However, comparisons remain, as stated by Olympian Alexi Pappas, “There truly is so much overlap between the world of Olympic athletics and the military: we are all elite athletes whose mission is to push ourselves beyond our limits to achieve extraordinary goals” (para. 2).⁶ Yet, as mentioned previously, there are no empirical studies assessing where similarities and differences truly exist between elite athletes and military personnel. Senior military leaders who base assumptions solely on anecdotal similarities are missing important insight on how PJs might differ from elite athletes in unique and meaningful ways. Although the physical conditioning and mental skills required to maintain a high level of performance may be similar between the two communities, the variability between these two groups regarding social, emotional, and behavioral functioning remains unknown and may be critical to understanding psychological traits critical to success within the PJ community.

Overall, the aim of this study addresses the gap in the literature by empirically evaluating the similarities and differences in emotional, social, and behavioral functioning between USAF PJs and world-class, Olympic-level athletes. The results of this data-driven study will help provide clear evidence and insight into the strength and direction of specific personality traits universal to those who pursue and excel within physically and psychologically demanding high-performance occupations. Such information can be used to help improve the effective delivery and utilization of services geared toward enhancing health, recovery, and performance within such unique high-risk, high-demand environments.

METHODS

Subjects

Subjects included 160 U.S. PJ training candidate graduates between 2014 and 2017 and 73 elite athletes between 2020 and 2021. Although the PJ career field was open to women starting

in 2016, there were no female candidates at the time of data collection. The average age of the PJ training candidates who successfully completed training was 21.7 yr (SD = 2.9). Additional demographic information was not available for this study. The PJ training courses have an 86–90% attrition rate,⁴ and those who complete training are considered to be among an elite group of special warfare operators.

The elite athlete sample included world champion and Olympic-level USA track and field (USATF) athletes. The current sample of male elite athletes includes those who have won a total of 43 gold, silver, and bronze medals (**Table I**). The average age of the elite athlete sample is 28.0 yr (SD = 4.9). This study was reviewed by the Air Force Research Laboratory Institutional Review Board at Wright-Patterson AFB, OH, and assigned protocol number FWR20200125H.

The criteria for selection of elite athlete participants included USATF athletes who were: 1) part of the Tiered (1-3) or Talent Protection Program (TPP); 2) a member of a USA World or Olympic Team; or 3) a 2020 Olympic Trials qualifier. These criteria ensured that all participants had experience competing at an elite level or were currently receiving funding because their performances indicated they had the ability to compete in an upcoming Olympic Games and/or World Championships. The criteria for Tiered and TPP athletes focuses on world ranking, marks from the previous season, and medal-winning performances at previous championships such that all Tiered and TPP athletes are deemed to have the potential to medal or compete at a future Olympic Games or World Championships.

Materials

Personality testing included the administration of a commercially based instrument (i.e., NEO Personality Inventory-3 [NEO-PI-3]). The NEO-PI-3 consists of 240 items and takes about 30 min to complete. Each item has a 5-point response scale, with responses ranging from “strongly disagree” to “strongly agree.” This instrument measures 5 major personality domains—Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness—and 30 different facets in total within all 5 domains. The NEO-PI-3 meets professional psychometric reliability and validity qualities and standards for use as a noncognitive assessment instrument¹⁰ and is used to provide additional information regarding the strengths and vulnerabilities and to assess for potential adaptation problems. In military settings, the NEO-PI-3 is used as part of a battery of tests to identify maladaptive personality traits or maladaptive behavior that could interfere with performance in high-risk, high-demand operational duty positions. Evidence for the reliability and validity has been well established, with reliability coefficients ranging

between 0.91 to 0.93 for the domain scores and 0.62 to 0.92 for the facet scores.¹⁰

Procedure

The researchers collaborated with the USATF High-Performance Director to explain the criteria needed to meet the requirements of the study. Eligible participants were notified about the study and connected with the researchers. Additionally, the researchers traveled to key meets in the buildup to the Tokyo Olympic Games to recruit participants in person. The researchers communicated directly with the USATF High-Performance Director to identify critical meets with a high number of Olympians and potential 2020 Olympic Games qualifiers. In-person data collection occurred in Austin, TX, Eugene, OR, Walnut, CA, and Prairie View, TX. After the researchers introduced eligible participants to the study, those interested were sent an email with more study information. The email information included their research identification number and a link to the computerized version of the NEO-PI-3, and provided them with relevant study information so that they understood the purpose and conditions of participating in the assessment. All participants were given information regarding the procedures in place to maintain the confidentiality of their data and maximize self-disclosure. Administration followed a standardized set of instructions, and participants completed testing from their personal computer or mobile-based device (such as a cell phone). Testing was automatically scored via computer upon completion.

The NEO-PI-3 testing was administered to candidates in the first week of basic military training. Testing is administered as part of an aeromedical clinical psychology program for airmen going into high-risk, high-demand career fields and who have to meet enhanced medical standards. Candidates were informed that testing was voluntary, would not affect their training disposition or military status, but would be used as a baseline assessment of their psychological functioning to help improve the delivery of embedded mental health care, if needed, and for research purposes only. They were also informed that test scores were confidential to help maximize self-disclosure. De-identified data were stored on the secure Air Force Research Laboratory database and were accessed by USAF research personnel for inclusion in this study. The researchers used previously published data from a USAF technical report assessing the utility of pretraining personality testing with predicting performance outcomes.⁴

Statistical Analyses

Descriptive statistics were used to characterize PJs and elite athletes with respect to age and NEO domain and facet scores. Specifically, means and SDs were calculated for domain and facet scores, and two-sample *t*-tests were used to compare scores across domains and facets. Raw scores were used for the analyses and Welch's *t*-test was used to account for unequal sample variance and unequal sample size. This study reported *P*-values, corresponding test statistics, and effect sizes for all comparisons. Due to the uneven sample sizes, Hedges' *g* was reported

Table I. Summary of Medal Count for Elite Athletes.

MEDAL	WORLD CHAMPIONSHIPS	OLYMPIC GAMES	WORLD INDOOR CHAMPIONSHIPS
Gold	11	4	4
Silver	5	9	2
Bronze	4	3	1

Table II. Internal Consistency for Each Sample of the NEO Domains.

NEO DOMAIN	CRONBACH'S ALPHA	
	ATHLETES (N = 73)	PJs (N = 160)
N: Neuroticism	0.80	0.83
E: Extraversion	0.84	0.76
O: Openness	0.73	0.65
A: Agreeableness	0.71	0.72
C: Conscientiousness	0.87	0.86

for effect sizes. The *P*-values were not adjusted for multiple comparisons across the NEO domains and facets. However, effect sizes of 0.5 or greater were considered to represent statistically significant tests (as defined by Hedges and Olkin⁸), as effect sizes of this magnitude were associated with Bonferroni-adjusted α -levels of approximately 0.001.

RESULTS

Cronbach's alpha is presented to assess the internal consistency of the six facet scores that compose each NEO domain across each sample (Table II).

The means and SDs for the NEO-PI-3 domain and facet scores for the total sample of PJs and elite athletes are shown in Table III. The comparison between these two groups revealed several significant differences across domains and facets.

Across NEO-PI-3 domains, results indicated statistically significant differences between PJs and elite athletes on three of the five domains. PJs were lower in Neuroticism [$t(122.87) = -7.44, P < 0.001$] and higher in Extraversion [$t(106.34) = 5.44, P < 0.001$] and Conscientiousness [$t(116.04) = 6.18, P < 0.001$] than elite athletes. Effect sizes greater than or equal to 0.5 were statistically significant. There was not a statistically significant difference between the two groups on Openness to Experience [$t(125.05) = -1.54, P = 0.13$] and Agreeableness, overall [$t(131.49) = 2.24, P = 0.03$].

PJs exhibited significantly lower levels of overall Neuroticism than elite athletes [$t(122.87) = -7.44, P < 0.001$]. There were statistically significant differences across all six facets related to Neuroticism, including anxiety [$t(124.32) = -5.26, P < 0.001$], angry hostility [$t(131.03) = -4.31, P < 0.001$], depression [$t(112.77) = -6.39, P < 0.001$], self-consciousness [$t(118.92) = -3.95, P < 0.001$], impulsiveness [$t(115.88) = -5.57, P < 0.001$], and vulnerability [$t(109.25) = -6.80, P < 0.001$]. Overall, results

Table III. Comparison of PJs vs. Elite Athletes.

DOMAIN/FACET	DESCRIPTIVE STATISTIC		COMPARATIVE TEST		
	PJ MEAN (SD)	ATHLETE MEAN (SD)	t-TEST	P-VALUE	EFFECT SIZE
N: Neuroticism	52.08 (18.06)	73.16 (20.92)	-7.44	0.00	1.11
N1: Anxiety	10.16 (4.54)	13.86 (5.18)	-5.26	0.00	0.78
N2: Angry Hostility	8.45 (4.48)	11.32 (4.81)	-4.42	0.00	0.62
N3: Depression	8.56 (3.94)	12.86 (5.11)	-6.39	0.00	0.99
N4: Self-Consciousness	8.86 (4.24)	11.58 (5.12)	-3.95	0.00	0.59
N5: Impulsiveness	11.05 (4.07)	14.82 (5.08)	-5.57	0.00	0.85
N6: Vulnerability	5.01 (3.08)	8.73 (4.17)	-6.80	0.00	1.07
E: Extraversion	132.34 (16.74)	115.69 (23.59)	5.44	0.00	0.87
E1: Warmth	24.46 (4.21)	22.16 (5.42)	3.20	0.00	0.50
E2: Gregariousness	19.16 (4.85)	15.81 (6.06)	4.16	0.00	0.64
E3: Assertiveness	20.88 (3.93)	18.89 (4.98)	3.01	0.00	0.46
E4: Activity	21.39 (3.45)	18.14 (4.64)	5.36	0.00	0.84
E5: Excitement-Seeking	23.73 (3.69)	19.78 (4.70)	6.33	0.00	0.98
E6: Positive Emotions	22.72 (4.46)	20.90 (5.66)	2.42	0.02	0.37
O: Openness to Experience	118.19 (17.01)	122.23 (16.76)	-1.54	0.11	0.23
O1: Fantasy	17.12 (4.90)	20.45 (4.62)	-5.01	0.00	0.69
O2: Aesthetics	17.20 (5.45)	17.80 (6.12)	-0.71	0.48	0.10
O3: Feelings	18.75 (4.83)	20.15 (4.82)	-2.05	0.04	0.29
O4: Actions	20.20 (3.56)	18.00 (3.67)	4.28	0.00	0.61
O5: Ideas	24.18 (5.02)	23.25 (5.71)	-1.20	0.23	0.18
O6: Values	20.74 (4.12)	22.59 (4.33)	-3.07	0.00	0.44
A: Agreeableness	123.90 (16.76)	118.36 (17.91)	2.23	0.02	0.32
A1: Trust	20.09 (4.47)	19.06 (4.75)	1.57	0.12	0.22
A2: Straightforwardness	20.38 (4.61)	19.58 (4.25)	1.30	0.20	0.18
A3: Altruism	25.70 (3.58)	23.45 (4.31)	3.88	0.00	0.59
A4: Compliance	16.07 (4.49)	15.22 (5.10)	1.22	0.22	0.18
A5: Modesty	20.03 (4.59)	18.60 (5.13)	2.02	0.05	0.30
A6: Tendermindedness	21.64 (4.27)	22.45 (4.41)	-1.32	0.19	0.19
C: Conscientiousness	145.56 (17.62)	127.49 (21.95)	6.18	0.00	0.95
C1: Competence	25.15 (3.36)	23.19 (4.00)	3.53	0.00	0.55
C2: Order	21.60 (4.58)	19.43 (5.21)	3.06	0.00	0.45
C3: Dutifulness	25.93 (3.28)	21.78 (4.11)	7.59	0.00	1.16
C4: Achievement-Striving	27.51 (3.18)	24.96 (4.17)	4.64	0.00	0.72
C5: Self-Discipline	25.93 (3.80)	20.29 (5.57)	7.86	0.00	1.27
C6: Deliberation	19.45 (4.42)	17.85 (5.10)	2.31	0.02	0.34

suggest that PJs exhibit lower levels of Neuroticism (i.e., higher levels of emotional stability) than elite athletes.

PJs exhibited significantly higher levels of overall Extraversion than elite athletes [$t(106.34) = 5.44, P < 0.001$]. Namely, PJs demonstrated higher levels of warmth [$t(113.36) = 3.20, P < 0.001$], gregariousness [$t(115.72) = 4.16, P < 0.001$], activity [$t(109.71) = 5.36, P < 0.001$], and excitement-seeking [$t(114.03) = 6.33, P < 0.001$], on average. In addition, self-reported levels of assertiveness [$t(114.48) = 3.01, P = 0.003$] and positive emotions [$t(114.46) = 2.42, P = 0.02$] were higher for PJs, but the effect sizes were not statistically significant.

There was no significant difference in PJs and athletes on the overall domain Openness to Experience [$t(125.05) = -1.54, P = 0.13$]. However, statistically significant differences emerged in two facets—fantasy [$t(147.25) = -5.01, P < 0.001$] and actions [$t(135.65) = 4.29, P < 0.001$ —with PJs reporting lower scores on fantasy and higher scores on actions. There were no statistically significant differences on aesthetics [$t(126.01) = -0.71, P = 0.48$], feelings [$t(139.66) = -2.05, P = 0.04$], ideas [$t(124.71) = -1.20, P = 0.23$], and values [$t(133.51) = -3.07, P = 0.002$], although PJs' scores did trend lower on these facets, on average, than elite athletes'.

PJs exhibited significantly higher levels of overall Conscientiousness than elite athletes [$t(116.04) = 6.18, P < 0.001$]. Notably, results indicated that PJs had statistically significant higher levels of competence [$t(120.21) = 3.64, P < 0.001$], dutifulness [$t(115.68) = 7.59, P < 0.001$], achievement-striving [$t(111.59) = 4.64, P < 0.001$], and self-discipline [$t(103.61) = 7.86, P < 0.001$] compared to elite athletes. The two remaining facets, including order [$t(124.74) = 3.07, P = 0.003$] and deliberation [$t(123.17) = 2.31, P = 0.02$], demonstrated a similar positive trend, but were not statistically significant.

The overarching domain of Agreeableness did not demonstrate significant differences between PJs and elite athletes [$t(131.49) = 2.24, P = 0.03$]. However, one facet within the domain emerged as statistically significant, with PJs demonstrating higher levels of altruism when compared to elite athletes [$t(118.93) = 3.88, P < 0.001$].

DISCUSSION

Results from this study suggest that although there are physical and psychological challenges inherent in both the PJ and elite athlete career field, the emotional, social, and behavioral functioning of PJs differs significantly and in functional ways from the elite athlete population. In the sections below, we summarize these differences, discuss applied implications within the PJ career field, address future areas of research, and note the limitations related to the current study.

The results of this study found, when compared with elite and Olympic-level track and field athletes, PJs are less susceptible to experiencing negative emotional states in general (i.e., neuroticism), as well as the more specific states of fear, worry, apprehension (anxiety), irritability, frustration (angry hostility), sadness, and helplessness (depression). The findings also

revealed PJs are less susceptible to feelings of awkwardness and embarrassment (self-consciousness), as well as less susceptible to reacting impulsively (impulsiveness). Overall, the results of this study suggest PJs possess greater levels of emotional resilience and stamina when compared with elite and Olympic-level track and field athletes.

The finding that PJs possess greater levels of emotional stamina appears consistent with the requirements of adapting and performing in highly intense, life-threatening conditions with many unknown and uncontrollable factors. Given the conditions that PJs must operate within, the greater levels of emotional stamina appear logical. As a result, military leadership may consider the reality that operating within CSAR operations requires a level of emotional stamina exceeding that of elite and Olympic-level athletes.

The difference in emotional functioning may also shed light on the different pressures that world class athletes experience when compared to PJs. Athletes must perform in the moment, on demand, and in the spotlight while, at times, millions are watching. The pressure to perform from media influence, sponsor expectations, contractual obligations with financial impact depending on the result of the performance, expectations from family, coaches, and other stakeholders such as national governing bodies, or even the internal pressure they place on themselves adds to the emotional burden athletes carry. The embarrassment of a poor performance or sensitivity to public ridicule that elite athletes often experience can also be a significant emotional stressor. Regardless of such challenges, the emotional pressures of athletes do not reflect the life and death conditions in which PJs must operate.

The between-group differences in susceptibility to negative emotional states might also speak to the level of emotional stamina needed to adapt to extreme CSAR missions and the types of personalities drawn to the career field. The environment elite athletes compete in could be perceived as more of a controlled and safe environment that is accompanied by predictable environmental conditions and governed by competition rules. The higher level of emotional stamina likely serves as an important and adaptive function within PJs given the type of operational missions in which they must perform. The higher levels of emotional stamina in PJs likely plays an important role in performing in uncontrolled, unsafe, and unpredictable environments where the possibilities of being injured, disfigured, disabled, or killed are very real.

Another contributing factor to PJs' higher levels of emotional stamina may be influenced by extensive screening for mental health issues prior to entering and remaining in the career field. Only those who have fully recovered, have low susceptibility to recurrence, pose minimal safety risk, or have no history of mental health issues are allowed into the training pipeline. Those same standards do not apply to elite athletes. In fact, many elite athletes, including Michael Phelps, the most decorated Olympian of all time, and USATF World Champion and Olympic Medalist Noah Lyles, have openly discussed their own mental health struggles prior to competing in events.

Results suggest that PJs tend to be overall more socially outgoing than elite athletes. The results suggest that PJs are more affectionate, friendly (warmth), and outgoing (gregariousness). These social preferences may support the PJ team aspect of training as well as the job requirements of working within a Special Operations Command team across military branches and with specific joint North Atlantic Treaty Organization missions. Higher levels of occupational tempo (activity) and the tendency to seek out excitement and stimulation (excitement-seeking) serve as functional aspects given the job duties. For example, deploying into restricted, hostile, and politically sensitive environments and parachuting out of a plane to save a life are not the best career choice for highly introverted, risk-averse individuals, who prefer a slower paced social lifestyle. Being comfortable with a rapid tempo while continuously operating in groups and fluctuations in routine appears to be a characteristic of successful PJs.

On the other hand, the road to being an elite and Olympic-level track and field athlete can be lonely. Many athletes can spend significant time training in isolation from others to achieve their goals. For example, track and field athletes are often depicted alone in commercials, whether on a deserted road training before sunrise or an empty track at sunset. Allyson Felix, the most decorated track and field athlete of all time, winning 11 Olympic medals and breaking Carl Lewis's record, has shared stories of her sacrifices throughout her career, including missing her high school prom and adding in additional training alone to make sure she was ready to compete to the best of her ability. The extra time and energy athletes put into being elite often leaves them disconnected from their peer groups.

PJs' mission outcomes depend on team collaboration and team success. PJs deploy as a unit, and the importance of the team is highly valued. For PJs, the social functioning of the team could impact a life-or-death outcome. For elite athletes in both team and individual sports, individual statistics are often viewed as an indicator of successful performance above and beyond team performance. Furthermore, the same life or death outcomes do not apply to team performance, and athletes can often walk away from a team loss with fans praising them for their impressive individual performance.

The results of this study also indicate that PJs have higher levels of consideration for others (altruism) when compared to elite and Olympic-level track and field athletes. This difference may likely be attributed to the PJ career field motto "That Others May Live." The commitment of PJs to assisting others in need of help is a core component of their job. The higher the score on altruism, the more compelled one feels to rescue others, whereas the lower the score on altruism, the less compelled one feels to help others. While PJs are focused on saving the lives of others, elite athletes perform more for the glory of the medal and distinguishing themselves from others. Elite athletes do not have the freedom or luxury to pursue or show interest in other people's problems because of their desire for individual glory. Emotionally, athletes can relate to others (sympathy), but perhaps engage in self-preservation by limiting the energy

required to engage in the act of helping because of the physical and emotional drain.

PJs and elite and Olympic-level track and field athletes have similar levels of openness to experience. Of note, however, such elite athletes have a more active and vivid imagination than PJs (fantasy). As a group, the elite athletes are likely to spend more time using visualization techniques and engaging in creative and innovative thinking. As a result, they are often more likely to be open to thinking about strategies and ideas that are unique, original, and distinct from conventional methods. This is in sharp contrast to the reality that PJs must face in their day-to-day work. For PJs, their thinking must be grounded in reality, conventional wisdom, and proven methods. The severity and readiness to respond to life and death situations depend on where they choose to keep their mind focused on the practical and conventional. Their lower scores on fantasy suggest that as a group, PJs tend to focus their thoughts on what they consider to be objective and realistic.

Behaviorally, PJs are more open to going new places and trying new activities (actions). PJs must operate in a variety of environments, whether that be on land and sea or within extreme heat or cold. Because they operate in such unique environments, their openness to experiences is likely associated with a PJ's willingness to adapt. Having an openness to trying new and innovative techniques is also important to saving a life while in combat. A PJ's willingness to take risks and think "outside the box" likely serves as a functional difference when compared to elite and Olympic-level track and field athletes. In contrast, such athletes often find a routine that works for them, and they do not deviate from that performance routine. Such athletes may cling to rituals, routines, and even superstitions to achieve desired outcomes. The elite athlete is less likely to experience the chaotic environmental and situational changes PJs experience, especially when deployed. The demands to adapt are likely more constant for PJs than elite athletes. An emphasis is also placed on maximizing rest and recovery between training and competitions for elite athletes. The differences measured in the Openness to Experience domain support both groups of high performers in novel ways.

PJs also reported higher levels of confidence in their abilities (competence). PJ personnel deploy into unpredictable, challenging environments and provide emergency trauma and field medical care, which likely require high levels of perceived self-competence across a wide range of settings. A moment of self-doubt for a PJ could have dire consequences, such as the loss of life. Elite athletes' skills are domain specific to their sport in a much more predictable track and field arena. Although elite athletes might have a high level of self-competence within the arena they compete in, that self-competence may not extend into other areas of their life. Overall, PJs perform many skills with an extreme level of proficiency, while elite athletes are only required to be exceptional at one skill.

PJs' higher level of sense of responsibility and commitment to others (dutifulness) may be reflected by their dedication to rescue/recovery missions and their willingness to sacrifice their

own life for the prosperity of their country. PJs are making a commitment to the very people who are part of their job (i.e., their fellow PJs). If they do not execute their job duties perfectly, it could cost the life of the people they are trying to rescue and the lives of the PJs who are part of their group. They likely have a higher commitment to others because they operate in a group environment and the consequences of a commitment failure are likely higher. Athletes may feel more justified in letting commitments to others slip because they are focused on giving priority to the single mission of enhancing personal performance and earning a medal.

PJs report a higher need to achieve (achievement-striving) than elite and Olympic-level track and field athletes. Such elite athletes already have high levels of achievement when compared to the general population, but PJs have a significantly higher level. This finding may come as a surprise because the core perception of elite athletes is their ability to work hard to achieve their Olympic dreams. However, PJs report a stronger drive in this domain than elite athletes, highlighting the importance of high aspirations and work ethic to handle the PJ career field. The standards PJs set for themselves are extraordinarily high and are adaptive for their career demands. PJs are exposed to extremely dangerous situations, and their achievement-striving mentality provides them with the belief they will complete the mission with success.

PJs report higher levels of discipline to complete tasks (self-discipline) than elite athletes, suggesting they are less vulnerable to procrastinating or quitting before their job is complete. Elite athletes may choose to take a season off or have a hiatus from the competitive arena, but PJs are not afforded this luxury of exiting the career field and reentering when they feel more motivated. Along these same lines, PJs must exhibit high levels of self-discipline and motivation under intensely distracting environments to carry out their missions, whereas elite athletes are often encouraged to take a break, recover, and commence their training another day. Additionally, elite athletes have the infrastructure of their coach, trainers, and other support staff members to motivate them when they lack self-discipline and motivation.

There are three limitations of this study worth noting. First, the results of this study may not generalize to other special warfare career fields. Additionally, we focused on track and field athletes for the comparison group in this study, and the unique characteristics of the individual sport may impact the generalizability of our findings. For example, athletes from team sports may exhibit higher levels of extraversion and consideration for their teammates and therefore may be more like PJs rather than track and field athletes. Replicating this study with an additional group of elite athletes from a team sport may shed light on the drivers of personality differences between elite track and field athletes and PJs. Second, the NEO-PI-3 is a self-report assessment, and thus impression management and lack of full disclosure could impact the results. Although all participants were assured of the confidentiality of their results, some may have answered the questions in a more desirable way than others. Third, the lack of

demographic data available for this study prevented the researchers from matching participants on age, education, and other demographic variables that may impact similarities and differences between the two groups. Future studies may investigate groups with similar demographic variables such as race, age, marital status, and education.

The results of this study illuminate quantitative data measures on personality characteristics to assist leadership, embedded clinical psychologists, and performance psychology professionals with appropriate interpretation of psychological test scores assessing multiple areas of emotional, social, and behavioral functioning when evaluating PJs and elite track and field athletes. The data obtained from this research may help to improve readiness evaluations, as well as develop performance enhancement interventions. The results of the study may also provide insight into the strength and direction of specific personality traits universal to those who pursue and excel within physically and psychologically demanding high-performance occupations. Job duties of military personnel in high-risk, high-demand communities as well as elite athlete requirements require adaptation to highly strenuous, physically and psychologically demanding conditions. Although this study is exploratory in nature, it will help inform key personnel on the characteristics that may enhance or undermine performance.

Over the last decade, the military has increased attention on providing psychological skills training to help warfighters handle stress, thereby increasing performance.^{14–16} Whether you are a PJ or elite athlete, it is clear: optimizing human performance in the competitive arena is the key to success. Although there are obvious differences in job duties, career demands, and performance conditions, both groups are striving for excellence under intense conditions. Even considering the differences in social, emotional, and behavioral functioning highlighted in this research, there are many avenues of collaboration between sport and military psychology worth pursuing because of the common goal of achieving peak performance under stressful and adverse conditions.¹⁶

Implementation of nontraditional and innovative embedded care strategies to help manage the demands placed on this population is becoming more of the norm. These strategies include embedding psychologists and performance enhancement professionals within special operations units to support mission readiness, recovery, and peak performance. This research may provide additional insight into how psychologists and performance enhancement professionals embedded in these units may leverage personality data to improve performance readiness and overall mission success. The results of this study can be used to improve the delivery of embedded mental health services geared toward improving training and enhancing health, recovery, and performance within operational units. By better understanding the psychological traits of PJs, the Air Force can improve selection, training, employment, and reconstitution of such a unique group of military personnel in a way that maximizes human and monetary capital.

ACKNOWLEDGMENTS

The authors of this study would like to thank Mr. William Thompson (Chief Executive Officer, NeuroStat Analytical Solutions, LLC, Great Falls, VA) for his mentorship and guidance. His wisdom was invaluable with developing the strategy to carry out this unique research study with elite and Olympic-level athletes competing within restricted access events. Data are government property and are not available for public release without written consent from the Department of the Air Force. The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Air Force, the Department of Defense, or the U.S. Government.

Financial Disclosure Statement: The authors have no conflicts of interest to report. This research was funded by the U.S. Air Force School of Aerospace Medicine Studies & Analysis Program, 20-S005, as part of its ongoing efforts toward improving the health and optimizing the development of U.S. special duty military training and operations.

Authors and Affiliations: Anne Shadle, Ph.D., Sport Psychology and Elite Performance Team Lead, and Wayne Chappelle, Psy.D., Branch Chief for Aeromedical and Clinical Psychology, Aerospace Medicine Department, U.S. Air Force School of Aerospace Medicine, Wright-Patterson AFB, OH; Lennie Waite, Ph.D., Industrial/Organizational and Sport Psychology Subject Matter Expert, Aerospace Medicine Department, U.S. Air Force School of Aerospace Medicine, Wright-Patterson AFB, OH, and NeuroStat Analytical Solutions, LLC, Great Falls, VA.

REFERENCES

1. Bartone PT, Roland RR, Picano JJ, Williams TJ. Psychological hardiness predicts success in U.S. Army Special Forces candidates. *Int J Sel Assess*. 2008; 16(1):78–81.
2. Chappelle W, McDonald K, Thompson W, Bryan CJ. Personality strengths among graduates of U.S. Air Force combat controller training. *Mil Behav Health*. 2014; 2(3):257–263.
3. Chappelle W, Skinner E, Thompson W, Schultz R, Hayden R. Assessing the utility of noncognitive aptitudes as additional predictors of graduation from U.S. Air Force pararescue training. Wright-Patterson AFB (OH): U.S. Air Force School of Aerospace Medicine; 2017. Technical Report No. AFRL-SA-WP-TR-2017-0007.
4. Chappelle W, Thompson W, Ouenpraseuth S, Spencer H, Goodman T, et al. Pre-training cognitive and non-cognitive psychological predictors of U.S. Air Force pararescue training outcomes. Wright-Patterson AFB (OH): U.S. Air Force School of Aerospace Medicine; 2018. Technical Report No. AFRL-SA-WP-TR-2018-0016.
5. DeWiggins S, Hite B, Alston V. Personal performance plan: application of mental skills training to real-world military tasks. *J Appl Sport Psychol*. 2010; 22(4):458–473.
6. Gercken D, Johnson DR. Soldiers and elite athletes cope with similar challenges, says Olympic athlete Alexi Pappas during ARD webinar. 2021 Mar 18. [Accessed 1 Aug. 2021]. Available from https://www.army.mil/article/244421/soldiers_and_elite_athletes_cope_with_similar_challenges_says_olympic_athlete_alex_i_pappas_during_ard_webinar.
7. Goodwin GF. Psychology in sports and the military: building understanding and collaboration across disciplines. *Mil Psychol*. 2008; 20(Suppl. 1): S147–S153.
8. Hedges LV, Olkin I. Statistical methods for meta-analysis. Orlando (FL): Academic Press; 1985.
9. Jensen AE, Bernards JR, Jameson JT, Johnson DC, Kelly KR. The benefit of mental skills training on performance and stress response in military personnel. *Front Psychol*. 2020; 10:2964.
10. McCrae RR, Costa PT. NEO inventories for the NEO Personality Inventory-3 (NEO-PI-3), NEO Five-Factor Inventory-3 (NEO-FFI-3), NEO Personality Inventory Revised (NEO-PI-R) professional manual. Lutz (FL): Psychological Assessment Resources; 2010.
11. McCrory P, Cobley S, Marchant P. The effect of psychological skills training (PST) on self-regulation behavior, self-efficacy, and psychological skill use in military pilot-trainees. *Mil Psychol*. 2013; 25(2):136–147.
12. Meland A, Ishimatsu K, Pensgaard AM, Wagstaff A, Fonne V, et al. Impact of mindfulness training on physiological measures of stress and objective measures of attention control in a military helicopter unit. *Int J Aviat Psychol*. 2015; 25(3-4):191–208.
13. Meyer VM. Sport psychology for the soldier athlete: a paradigm shift. *Mil Med*. 2018; 183(7-8):e270–e277.
14. Picano JJ, Williams TJ, Roland RR. Assessment and selection of high-risk operational personnel: identifying essential psychological attributes. In: Kennedy CH, Zillmer EA, editors. *Military psychology: clinical and operational applications*. 2nd ed. New York (NY): The Guildford Press; 2012:50–72.
15. Taylor MK, Stanfill KE, Padilla GA, Markham AE, Ward MD, et al. Effect of psychological skills training during military survival school: a randomized, controlled field study. *Mil Med*. 2011; 176(12):1362–1368.
16. Wagstaff CRD, Leach J. The value of strength-based approaches in SERE and sport psychology. *Mil Psychol*. 2015; 27(2):65–84.