Technical Report 1208

Personality Profiles of U.S. Army Initial Entry Rotary Wing Students Versus Career Aviators

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for the Behavioral and Social Sciences**

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14. ABSTRACT *(Maximum 200 words)*:

The U.S. Army Research Institute for the Behavioral and Social Sciences Rotary Wing Aviation Research Unit (ARI RWARU) administered the Revised NEO Personality Inventory to 217 student Army aviators awaiting Initial Entry Rotary Wing training. Scores reflected the incoming aviators' standings on five personality factors: neuroticism, extraversion, openness, agreeableness, and conscientiousness. The male student factor and facet scores were then compared with a sample of male career Army aviators. Personality differences and similarities between the two samples are discussed as laying the foundation for longitudinal research.

15. SUBJECT TERMS
Aviator personality; Army aviator; personality; neuroticism; extraversion; openness; agreeableness; conscientiousness; NEO-PI-R

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PERSONALITY PROFILES OF U.S. ARMY INITIAL ENTRY ROTARY WING STUDENTS VERSUS CAREER AVIATORS

EXECUTIVE SUMMARY

Research Requirement:

In 2004, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) was tasked with conducting the research and development towards developing a computer-based and web-administered Selection Instrument for Flight Training (SIFT), with emphasis upon aptitudes for Future Force aviator performance. The review of the selection literature and aviator job analysis conducted for that effort indicated that personality is an attribute that might warrant consideration in Army aviator selection and aircraft assignment. Thus, the goals of this research were to identify those personality traits of individuals selecting aviation as their specialty and to compare these scores with the scores of career aviators.

Procedure:

To address the question, "What is the personality profile of incoming student U.S. Army rotary-wing aviators?" 217 student Army rotary-wing aviators attending initial entry rotary-wing flight training completed the Revised NEO Personality Inventory (NEO-PI-R). The NEO-PI-R is a self-report questionnaire in which subjects rate statements on a 5-point scale from "strongly disagree" to "strongly agree." Scores depict the five personality factors of: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Scores were compared based on rank and gender.

To address the question, "What similarities and differences exist between the personality profiles of incoming students and career Army aviators?" factor scores from the male respondents of the student sample ($n = 196$) were compared with a male sample of career aviators ($n = 75$). Since the career sample was entirely male, the data collected from the female incoming student aviators were eliminated from this report. However, a future technical report will concentrate on female aviators and will include the findings from the incoming female student aviators.

Findings:

The male student aviators scored in the average range on four of the five factors of the Five-Factor Model. Only Agreeableness was in the low range. Low Agreeableness suggests that the student aviators are more concerned with individualism and improving individual competence than maintaining social relationships that consume their time and energy.

The second research question involved a comparison between student aviator profiles and the personality profiles of career aviators. Differences were found in Neuroticism, Openness, and Agreeableness. Career aviators scored low in Neuroticism and Openness while student aviators were in the average range. Student aviators scored low in Agreeableness while career aviators were in the average range.

Utilization and Dissemination of Findings:

This research is one of many emanating from the SIFT effort. This report documents the personality evaluation portion of the effort, which may contribute to the development of a classification instrument to accompany the SIFT selection instrument. Documentation of the development of these instruments helps to establish the scientific and theoretical underpinnings of the tests and serves to provide a basis for any revisions the Army may wish to make later. Therefore, the findings will be disseminated to the entities involved in or interested in the development of the Army's aviator selection and classification systems, as well as those interested in personality and aviation.

PERSONALITY PROFILES OF U.S. ARMY INITIAL ENTRY ROTARY WING STUDENTS VERSUS CAREER AVIATORS

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PERSONALITY PROFILES OF U.S. ARMY INITIAL ENTRY ROTARY WING STUDENTS VERSUS CAREER AVIATORS

Introduction

U.S. Army rotary-wing aviation has a proud heritage of providing support to troops on the battlefield. Army aviation relies upon highly skilled aviators to fly the different types of rotary-wing aircraft that are often tasked with unique support or combat functions within the Army. The Army relies upon an extensive selection process involving an interview with a current Army aviator and passing a physical examination as well as successful completion of an aptitude test measuring different dimensions (e.g., perceptual skills, mathematical knowledge) considered necessary for effectiveness as an Army aviator.

Findings from organizational and military psychology have suggested that personality traits could be predictive of vocational performance and productivity. For instance, person-environment fit theory suggests that perceptions of congruence between personality traits and interests and the characteristics associated with different types of vocations will increase the likelihood of the individual experiencing job satisfaction and high performance over time, while incongruence increases the likelihood of job dissatisfaction and attrition (e.g., Barrick & Mount, 1991). The relevance of this possibility for Army aviation applies to the desire for maximum aviator performance in the cockpit and to the desire to keep highly performing aviators in Army aviation since the Army makes a substantial investment in aviators' initial training. Under the newly implemented Flight School XXI training program, Wesolek (2007) estimated the cost to train a single aviator as ranging from $265,000 to $509,000, depending on the type of aircraft (Wesolek, 2007).

The personality profiles of experienced Army aviators could provide some indication of the profile most likely to demonstrate high performance and to assimilate into the organizational environment of Army aviation. For example, Picano (1991) reported that the experienced Army aviators (i.e., instructor pilots) in his study typically cluster under the same set of personality characteristics that he defined as the "right stuff" for Army aviators. One reported investigation identified a baseline personality profile for experienced Army aviators using the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) which is based on the Five-Factor Model (Costa & McCrae, 1985) of personality (Grice & Katz, 2006). No published research has compared the personality profiles of experienced aviators with new student aviators.

Background

Personality research with U.S. Army rotary-wing aviators is sparse. Four online databases were searched for this investigation. These included PsychInfo, EBSCOhost, Annual Review of Psychology, and the Defense Technical Information Center (DTIC). The databases were searched using terms such as "aviator personality," "personality and performance," and "aviator performance." DTIC is devoted primarily to military technical reports while the remaining databases report primarily refereed journal articles.

Different personality instruments have yielded results that can be confusing or difficult to interpret in relation to job performance, especially since these instruments were designed for a clinical population with psychopathology (Callister, King, Retzlaff, & Marsh, 1997; Dolgin, Kay, Langelier, Wasel, & Hoffman, 2002; King, McGlohn, & Retzlaff, 1997; Retzlaff & Gibertini, 1987). Studies using the NEO-PI-R have proven to be more helpful in identifying the personality traits of aviators. For example, Fitzgibbons, Davis, and Schutte (2004) reported a personality profile for commercial aviators as being emotionally stable (low Neuroticism) and highly conscientious about their performance. These aviators were likely to be trusting, straightforward, and assertive. The NEO-PI-R has been used to link personality with performance. For example, Anesgart and Callister (2001) found that scores on Neuroticism could predict who would likely attrite from flight training in the U.S. Air Force (USAF).

Purpose

Personality profiles could be one of the factors that will predict the aviator most likely to demonstrate high performance and pursue tenure in Army aviation. High performance and tenure are important considerations since the Army expends tremendous resources on initial aviation training (Wesolek, 2007). Therefore, the dual purposes of this research were to identify a baseline personality profile for incoming aviation students and to compare this with findings from career aviators to see if the profiles differed between the two groups.

Literature Review

Aviator Personality

Descriptions of aviator personality traits have been offered since the birth of aviation at the beginning of the twentieth century (Dockery & Isaacs, 1921; Rippon & Manual, 1918). The lack of an empirically-based instrument for measuring personality traits resulted in mixed personality descriptions. For example, Rippon and Manuel depicted aviators as "outgoing" and "risk-taking" while Dockery and Issacs described them as "methodical" and "quiet."

Subsequent research has attempted to use empirically-validated instruments in an attempt to identify an aviator personality profile. Findings from these studies have often resulted in identifying clusters of traits rather than a specific profile (Picano, 1991; Retzlaff & Gibertini, 1987). For example, Retzlaff and Gibertini administered the Personality Research Form and the Millon Clinical Multiaxial Inventory (MCMI; Millon, 1977) with 350 male students entering USAF Undergraduate Pilot Training. Rather than finding one personality profile that could be generalized to all of the aviators, they found that the trait levels reported produced three clusters of traits they labeled "wrong stuff," "company-man," and "right stuff" in terms of characteristics they perceived as being most conducive to performance as aviators.

A potentially useful approach to assessing aviator personality would be to use a personality instrument that will reduce the number of characteristics to a smaller number of broad factors. This was the rationale behind the use of the NEO-PI-R for evaluating the profiles of experienced Army aviators (Grice & Katz, 2006), as well as the current investigation. The NEO-PI-R is based on the factors and facets of the Five-Factor Model (FFM).

Five-Factor Model

The FFM did not develop from any particular theory of personality. It grew out of factor analyses conducted through much of the twentieth century in response to the different trait-model approaches to personality such as the 16 PF model offered by Cattell (1943). Efforts to replicate Cattell's findings resulted in the personality dimensions clustering around five basic categories of traits rather than the 16 offered by Cattell (Fiske 1949; Tupes, 1957; Tupes & Christal, 1961).

The five categories of traits identified by Fiske (1949) and Tupes (1957; Tupes & Christal, 1961) were examined by Norman (1963) and support was found for their validity (Barrick & Mount, 1991; Digman, 1990; Goldberg, 1981; McCrae, Costa, del Pilar, Rolland, & Parker, 1998). Costa and McCrae (1985) provided the global factor labels for the FFM that are measured by the NEO-PI-R, including: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (Table 1).

Table 1

Factor Descriptions of the Five-Factor Model

Factor	Description
Neuroticism	Contrasts emotional adjustment and stability with maladjustment such as a frequent depression or anxiety
Extraversion	Contrasts aspects of sociability with a disposition towards introversion and independence
Openness	Contrasts aspects of imagination and curiosity with conventionality and obeying the rules
Agreeableness	Contrasts aspects of altruism and compliance with aspects of antagonism and egocentrism
Conscientiousness	Contrasts aspects commonly associated with character such as self-discipline and dependability with impulsivity and disorganization

Each of the five factors of the FFM is comprised of six facets on the NEO-PI-R (see Table 2). Scores from the eight item statements that comprise each facet are totaled resulting in the facet scores. Each of the five factor scores is a total of the six facet scores that comprise that factor. Examining data at the facet level might increase the robustness of findings and increase the ability of the FFM to predict performance (Costa, McCrae, & Kay, 1995; Paunonen & Ashton, 2001).

Table 2

The Facets of the Five-Factor Model

Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Anxiety	Warmth	Fantasy	Trust	Competence
Angry Hostility	Gregariousness	Aesthetics	Altruism	Order
Depression	Assertiveness	Feelings	Compliance	Dutifulness
Self-Consciousness	Excitement-Seeking	Actions	Straightforwardness	Achievement-Striving
Impulsiveness	Activity	Ideas	Modesty	Self-Discipline
Vulnerability	Positive Emotions	Values	Tender-Mindedness	Deliberation

Note. Facet labels provided by Costa & McCrae, 1992.

Measuring the "Big Five" variables depicted by the FFM has emerged as one of the most frequently used methods for correlating personality traits with workplace performance (e.g., Barrick & Mount, 1991; Barrick, Mount, & Judge, 2001; Digman, 1989, 1990; Mount, Barrick, & Stewart, 1998; Tett & Burnett, 2003; Waldman, Atwater, & Davidson, 2004). Therefore, a review of the factors and facets of the FFM might suggest certain trait levels that could predict job performance for Army rotary-wing aviators. For example, high levels of Neuroticism would be expected to negatively correlate with performance, since this population must be able to manage operational stress adeptly. On the other hand, high Conscientiousness would seem to relate positively to performance outcomes since Army aviators are required to function within highly technical environments where a high degree of competence must be maintained in order to mitigate risks. Similarly, since aviators coordinate their actions as members of small, task-oriented aircrews, a high level of Agreeableness would be expected to correlate positively with performance outcomes.

FFM and aviator performance research. Performance issues with aviators are often based upon training proficiency and performance in the cockpit. The factors of the FFM have been found to predict aviator training attrition (Anesgart & Callister, 2001; Helton & Street, 1993). For instance, Anesgart and Callister (2001) found that high Neuroticism coupled with low Extraversion indicated that an aviator was more likely to self-eliminate from USAF flight school.

Aviator performance can be viewed as being related to a combination of attitudes, skills, and personality factors (Chidester, Helmreich, Gregorich, & Geis, 1991). Personality has been found to influence decision-making (Murray, 1999), crewmember leadership styles and communication in the cockpit (Kanki, Palmer, & Veinott, 1991), and the likelihood of experiencing an aviation mishap (Lardent, 1991). Kanki and Palmer (1993) concluded, "One important input to the interpersonal-communication-performance formula is the personality of each individual making up the crew. The separate personalities of crewmembers must be

integrated to create a single, effective, team with a positive orientation toward sharing tasks and information relevant to those tasks" (p. 116).

The personality traits relevant to aviator performance include those that apply to the tasks and those that influence interpersonal dynamics between crewmembers. Chidester and associates (1991) found that certain traits related to task performance such as goal orientation and independence, and others related to relationships such as interpersonal warmth, may predict team performance in the cockpit. Shinar (1995) found three personality characteristics that influence aviator performance: (a) a high need for achievement; (b) self-assertiveness and a willingness to face difficulties to complete the mission; and (c) a positive self-identity that remains stable regardless of cockpit experiences.

U.S. Army Aviators

Only four reported studies (Caldwell, O'Hara, Caldwell, Stephens, & Krueger, 1993; Geist & Boyd, 1980; Grice & Katz, 2006; Picano, 1991) examined the personality traits of Army rotary-wing aviators. Geist and Boyd (1980), using the Minnesota Multiphasic Personality Inventory (MMPI), found that aviators report more pathology than non-aviators, with higher scores in hypochondriasis, depression, psychasthenia, social introversion, and hysteria. While this research provided a snap-shot of Army rotary-wing aviator personality traits, it used a small sample (15 aviators and 16 non-aviation Army officers) and is over 25 years old, while numerous changes have taken place in Army aviation in the past quarter century. Changes in aviation technology and in the operational conditions where Army aviators are called upon to fly might indicate that a different set of characteristics such as personality traits are needed today.

Picano (1991) surveyed 170 U.S. Army rotary-wing aviators in order to validate the Occupational Personality Questionnaire. He found that three personality clusters or groups emerged in the sample. The largest group (48%) resembled those traits stereotypically ascribed to military aviators. Picano suggested that this group of aviators was outgoing and emphasized planning, logical analysis, and attention to detail. The aviators were also concerned with maintaining a positive image that would reflect positively on the Army. The second group (36%) was emotionally controlled, inhibited, and appeared apprehensive. They were found to prefer stability and predictability, and were uncomfortable in social situations. Picano suggested that they represented the "wrong stuff" and predicted these aviators would be the ones most likely to exit from military aviation. The third group (16%) of aviators represented the traits that are consistent with having the "right stuff." Aviators in this group were described as highly independent, competitive, and decisive. They were found to be least emotionally sensitive and exhibited the lowest concern for making a good impression. Picano found that many of the instructor pilots in his sample were in this group and offered that this might be due to the high competitiveness and need for achievement that often characterizes instructor pilots.

Using the MMPI, Caldwell et al. (1993) found personality differences between Army aviators applying to Special Operations training and conventional aviators, or those remaining in general aviation. Conventional aviators were found to have a greater sense of balance between characteristics associated with masculinity and femininity than Special Operations aviators. An explanation offered for this difference was that many of the conventional aviators were college-

educated and were more passive, aesthetically-oriented, and indirect in problem solving. The Special Operations aviators were more stereotypically masculine, more traditional, and more inflexible. While these findings are helpful in understanding the differences in masculinity between types of aviators, their benefit is limited in providing detailed insight into the personality profiles of Army rotary-wing aviators.

In addition to the age of personality research addressing Army aviators, a second shortcoming is the lack of research using the NEO-PI-R and the FFM. The FFM has received meta-analytical support as the best approach to use in making aircrew selection decisions for the USAF (Pedersen, Allan, Laue, Johnson, & Siem, 1992). Also, a study with U.S. Navy aviators found that the traits identified using other personality instruments could be categorized under similar dimensions as those comprising the FFM (Helton & Street, 1993). The NEO-PI-R has been offered as the instrument of choice to use in predicting performance with Air Force aviators (Anesgart & Callister, 2001; Callister et al., 1997).

Only Grice and Katz (2006) have explored the personality traits of career Army rotary-wing aviators using the NEO-PI-R. They found that career aviators were low in Neuroticism and Openness while in the average range in the remaining factors, compared to a normative sample. Aviator's scores were then compared based upon the aviator's primary aircraft (i.e., Attack, Scout/Observation, Cargo, or Utility). The only significant difference ($p < .01$) was between Attack and Utility aviators in Agreeableness. Specifically, the Attack aviators were lower in the Agreeableness facet of Trust. Low Trust suggests that the Attack helicopter pilots had more of a tendency to be self-reliant rather than placing their confidence in the input of others.

The Grice and Katz (2006) investigation was an initial step in creating a base of information for identifying the personality profile of experienced Army aviators based upon the NEO-PI-R. Surveying student aviators gives us some understanding of the personality profiles of individuals who are attracted to, and selected into, Army aviation today. A comparison of NEO-PI-R scores between the two groups enables the identification of traits that are similar and traits that are different. The causes of any identified differences would be a basis for future, longitudinal research.

Research Questions

The first purpose of this investigation was to identify the personality profiles of incoming student U.S. Army rotary-wing aviators based upon the personality factors of the FFM. Additionally, this research compared the NEO-PI-R scores of the student aviators with those of career Army aviators to see what similarities and differences might exist.

- Research Question #1: What is the personality profile of incoming student U.S. Army rotary-wing aviators?

- Research Question #2: What similarities and differences exist between the personality profiles of incoming students and career Army aviators?

Research Design

Sample

 Student aviators. Survey packets were provided to 240 incoming student aviators waiting to begin their Initial Entry Rotary-Wing training at Fort Rucker, Alabama. Survey packets consisted of a copy of the NEO-PI-R and a demographic form (Appendix A). Confidentiality forms were collected at the beginning of testing. Subjects were scheduled to being the initial phase of flight training in 2006. Twenty-three of the survey packets contained incomplete information on the NEO-PI-R or the demographic form and were not included in the sample ($n = 217$). The sample pool consisted of 196 male and 21 female incoming student aviators. The information collected from the females was eliminated from this research for comparison purposes since the career aviator sample was entirely male. A future technical report will examine the incoming female student data.

 Career aviators.   The career aviator sample ($n = 75$) was comprised of Warrant Officers who had achieved the rank of Chief Warrant 3 (CW3), Chief Warrant 4 (CW4), and Chief Warrant 5 (CW5).   Aviators at this rank were chosen for this investigation because they represent sufficient performance and perceived congruence with Army aviation to have pursued Army aviation as a career and are typically in instructor or leadership roles in Army aviation. All respondents were male.

Instruments

 A demographic form was created for the research and was provided to the student aviators seeking biographical information such as age, gender, level of education, aviation experience, and military experience. No names or Social Security Numbers were requested, in order to protect anonymity.

 The NEO-PI-R was used to measure personality. The most commonly used instrument for measuring FFM domains (Bernard & Walsh, 2004), the NEO-PI-R has been used across numerous vocations to evaluate relationships between personality and job performance. Costa and McCrae (1997) concluded, "We do not imagine that the FFM is the last word in personality structure, but we do believe that it will remain the basis of personality assessment for many years" (p. 87).

 Structure. The NEO-PI-R is a 240-item self-report questionnaire upon which respondents provide ratings to statements on a scale from 0 (strongly disagree) to 4 (strongly agree). The five resulting factor scores range from very low to very high. Facet scores were also generated for each sample, as several researchers (e.g., Callister et al., 1997; Paunonen & Ashton, 2001), have suggested that facet-level analyses can increase the richness of findings and should be considered in predicting performance.

 Reliability. Costa and McCrae (1992) reported high test-retest and internal consistency reliability. For example, Costa, McCrae, and Dye (1991) found good internal consistency of the FFM factor domains on a sample of 1,800 employees, with coefficient alphas ranging from .86 to .92. Internal consistency for facet scales ranged from .56 to .81.

Kurtz and Parrish (2001) examined the NEO-PI-R test-retest reliability among three groups of respondents categorized as low, moderate, or high in inconsistent responding (INC) during the initial administration. Test-retest interclass correlations for each group were found to be high across FFM domains based upon self-report and informant data. Low INC group correlations ranged from .92 to .95 on self-report data and from .75 to .93 on informant data. The moderate INC group correlations ranged from .85 to .95 on self-report data and informant data correlations ranged from .73 to .82. The high INC group correlations ranged from .71 to .94 on self-report data and ranged from .66 to .92 on informant data.

Kurtz, Lee, and Sherker (1999) provided further support for the test-retest reliability of the NEO-PI-R by evaluating undergraduate students over a 6-month period. Initial domain coefficient alphas ranged from .89 to .96, with a median of .80 on the facet scales. Test-retest Pearson correlations exceeded .70 for each domain.

Validity. Although the NEO-PI-R has been criticized for not including validity scales (Ben-Porath & Waller, 1992; Bernard & Walsh, 2004; Butcher & Rouse, 1996; Schinka, Kinder, & Kremer, 1997), research generally supports its validity and reliability (McCrae & Allik, 2002; McCrae, Costa, del Pilar, Rolland, & Parker, 1998; McCrae, Zonderman, Costa, Bond, & Paunonen, 1996). Costa and McCrae (1992) contend that validity scales are not necessary because validity checks are in place, including (a) the proper administration of the instrument, (b) judicious interpretation of responses, and (c) three items asking respondents if they answered honestly, completely, and correctly.

Much of the concern expressed over a lack of validity scales focuses on test-faking and non-purposeful responding (Rosse, Stecher, Miller, & Levin, 1998; Scarpello, Ledvinka, & Bergmann, 1995), but current research indicates that test-faking is not a significant problem. While several researchers have suggested strategies to mitigate the threat of test-faking (Barrick & Mount, 1996; Ellingson, Smith, & Sackett, 2001; Holden & Hibbs, 1995; Hough, Eaton, Dunnette, Kamp, & McCloy, 1991), Hogan (2005) countered that test-faking should not be a concern because: (a) many respondents lack the capacity to "improve" test scores; (b) respondents do not typically know what the desired response should be; and (c) evaluations of personality scores usually only consider a small portion of the scores rather than the entire profile.

Validity has been supported by studies correlating NEO-PI-R scores with other validated personality instruments. Factor scores from the NEO-PI-R have been found to correlate significantly with similar or related personality constructs as measured by the Myers-Briggs Type Indicator (MBTI; Myers & McCauley, 1985), the MMPI, and the Wechsler Adult Intelligence Scale – Revised (WAIS-R; Wechsler, 1981). For example, Furnham, Moutafi, and Crump (2003) reported significant correlations between the NEO-PI-R factors of Extraversion, Openness, Agreeableness, and Conscientiousness and the MBTI factors of Extraversion-Introversion, Sensing-Intuition, Thinking-Feeling, and Judging-Perceiving respectively. Costa, Busch, Zonderman, and McCrae (1986) found significant correlations between NEO-PI-R factor scores and MMPI factors. Significant correlations were also reported between the factor of Openness and IQ scores on the WAIS-R (Holland, Dollinger, Holland, & MacDonald, 1995).

The applicability of the FFM across cultures addresses concerns over cultural bias. The validity of the FFM has been supported in cross-cultural studies in which FFM-based instruments such as the NEO-PI-R have been translated into languages other than English. For instance, personality findings with Chinese (Trull & Geary, 1997), Greek (Tsaousis & Nikolaou, 2001), and Filipino (Avdeyeva & Church, 2005) samples have supported the validity of the FFM factors across cultures.

Procedures

Survey packets were administered to the student aviator sample during testing as part of the SIFT research project. Career aviators were given the survey packets when they attended advanced leadership training at the Warrant Officer Career Center (WOCC). Data were gathered at Fort Rucker, Alabama. All materials were to be returned except for one copy of the informed consent form. A random number was assigned to the materials in each packet in order to match the demographic information with NEO-PI-R scores.

Hand-scored answer sheets were used and scores were entered into a Statistical Package for the Social Sciences (SPSS) spreadsheet created for this investigation in order to mitigate the risk of calculation errors. A random sample ($n = 50$) of the hand-scored portion of the answer sheets was re-scored to mitigate risks of calculation errors. Statistical analyses were conducted using SPSS.

Findings

Demographics

Student aviators. The sample ($n = 217$) of student aviators' demographic information was aggregated by gender. Gender was an item on the demographic questionnaires because there are different scoring scales on the NEO-PI-R for each gender. The female data were eliminated from this research because the comparison with career aviators involves an all male sample. Female data will be explored in a future study. Ethnicity was not identified because the NEO-PI-R is not scored differentially based on ethnicity.

The incoming male student aviators ($n = 196$) represented warrant officer ($n = 114$) and commissioned officer ($n = 82$) ranks. The mean age for the warrant officers was 26 years ($SD = 3.44$) and 23 years ($SD = 2.01$) for commissioned officers. The mean years of current military service for the warrant officers was 5 years ($SD = 1.73$) and 3 years ($SD = 1.45$) for the commissioned officers. The mean years at the current rank for warrant officers was 2 years ($SD = 1.53$) and 2 years ($SD = .64$) for commissioned officers. Seventy-three of the warrant officers and 23 of the commissioned officers reported prior military service. Twenty-six warrant officers and 14 commissioned officers reported prior aviation experience. The mean hours of prior experience flight time was 16 ($SD = 46.27$) for warrant officers and 15 ($SD = 50.38$) for commissioned officers.

Career aviators. Demographic findings revealed a mean age of 45 (*SD* = 6.11) for the career aviators in this sample. Respondents reported a mean of 24 years (*SD* = 6.42) of military service and a mean of 20 years (*SD* = 6.50) of aviation experience. The mean years at current rank was 6 years (*SD* = 4.32).

Research Question #1

The first research question (i.e., "What are the personality profiles of incoming student U.S. Army rotary-wing aviators?"), yielded the identification of a personality profile for the student aviators based upon the NEO-PI-R factor scores collected in this research. Table 3 provides the descriptive statistics of the factor scores for the total sample of 196 incoming male aviation students. Overall, the students scored in the Average range on Neuroticism, Openness, and Conscientiousness. They scored High in Extraversion and Low in Agreeableness. This indicates that these students are outgoing, confident, excitement-oriented, and assertive, and are more concerned with individualism and improving individual competence than maintaining social relationships.

Table 3

Student Aviator NEO-PI-R Factor Scores

	N	E	O	AG	CO
n	196	196	196	196	196
Mean	68	120	108	111	128
Median	68	121	107	112	128
Mode	56	127	103	98	125
Std. Dev.	19.03	16.84	17.43	16.67	18.53
Skewness	-.175	.203	.183	-.178	-.050
Rank	Average	High	Average	Low	Average

Note. Factor names: N = Neuroticism; E = Extraversion; O = Openness; AG = Agreeableness; CO = Conscientiousness. The average range of scores is provided by Costa and McCrae (1992): Neuroticism (65-86); Extraversion (99-118); Openness (101-119); Agreeableness (112-128); Conscientiousness (115-133).

The factor scores of the 114 Warrant Officers and 82 Commissioned Officers are presented in Table 4 and Table 5, respectively. Warrant Officers were in the Average range on every factor except Agreeableness, which was in the Low range. Commissioned Officers in the student sample were in the Average range on every factor except Extraversion, which was in the High range.

Table 4

Warrant Officer Student Aviator NEO-PI-R Factor Scores

	N	E	O	AG	CO
n	114	114	114	114	114
Mean	66	116	105	111	128
Median	67	117	103	110	127
Mode	56	127	103	98	125
Std. Dev.	19.19	15.23	15.95	15.37	18.42
Skewness	-.121	-.030	-.085	.034	-.018
Rank	Average	Average	Average	Low	Average

Note. Factor names: N = Neuroticism; E = Extraversion; O = Openness; AG = Agreeableness; CO = Conscientiousness. The average range of scores is provided by Costa and McCrae (1992): Neuroticism (65-86); Extraversion (99-118); Openness (101-119); Agreeableness (112-128); Conscientiousness (115-133).

Table 5

Commissioned Officer Student Aviator NEO-PI-R Factor Scores

	N	E	O	AG	CO
n	82	82	82	82	82
Mean	71	124	113	113	129
Median	69	125	112	115	130
Mode	69	123	110	126	115
Std. Dev.	18.54	17.98	18.18	18.21	18.77
Skewness	-.204	.183	.237	-.433	-.092
Rank	Average	High	Average	Average	Average

Note. Factor names: N = Neuroticism; E = Extraversion; O = Openness; AG = Agreeableness; CO = Conscientiousness. The average range of scores is provided by Costa and McCrae (1992): Neuroticism (65-86); Extraversion (99-118); Openness (101-119); Agreeableness (112-128); Conscientiousness (115-133).

The facet scores for the incoming student aviators are presented in Table 6. Findings are presented for the sample as a whole, as well as for the sub-groups of Warrant Officers and Commissioned Officers within the student sample. The total sample scored in the Average range on all facets except for the Extraversion facets of Assertiveness, Activity, and Excitement Seeking, on which they scored in the High range. Differences between the WOs and Commissioned Officers were found on the facets of Gregariousness, Trust, Compliance, and Achievement Striving. Warrant Officers scored Average on Gregariousness, while Commissioned Officers scored High on this facet. Warrant Officers scored Low on Trust, while Commissioned Officers scored Average on this facet. Warrant Officers scored Average on Compliance, while Commissioned Officers scored Low on this facet. Warrant Officers scored High on Achievement Striving, while Commissioned Officers scored Average on this facet.

Research Question #2

The second research question (i.e., "What similarities and differences exist between the personality profiles of student and career Army aviators?") involved a comparison between the student aviators surveyed in this research and the NEO-PI-R scores of career aviators reported by Grice and Katz (2006). Table 7 contains the descriptive statistics of the NEO-PI-R factor scores for the career aviators. They scored in the Average range on the factors of Extraversion, Agreeableness, and Conscientiousness, when compared to a normative sample provided by Costa and McCrae (1992). They scored in the Low range on Neuroticism and Openness.

Table 6

NEO-PI-R Facet Means for Student Aviators

Facet	Warrant Officers			Officers			Total Sample		
	M (*n* = 114)	*SD*	Rank	*M* (*n* = 82)	*SD*	Rank	*M* (*n* = 196)	*SD*	Rank
N1 (Anxiety)	12	4.60	A	12	4.11	A	12	4.41	A
N2 (Angry Hostility)	12	4.63	A	11	4.28	A	12	4.94	A
N3 (Depression)	10	5.01	A	12	5.73	A	11	5.40	A
N4 (Self Consciousness)	12	4.64	A	13	3.59	A	13	4.23	A
N5 (Impulsiveness)	14	4.28	A	15	5.41	A	14	4.81	A
N6 (Vulnerability)	9	5.32	A	9	5.03	A	9	5.20	A
E1 (Warmth)	21	10.09	A	22	5.15	A	22	4.80	A
E2 (Gregariousness) *	18	4.82	A	19	4.54	H	18	4.80	A
E3 (Assertiveness)	19	3.76	H	20	4.64	H	19	4.14	H
E4 (Activity)	20	3.61	H	20	4.15	H	20	3.84	H
E5 (Excitement Seeking)	20	3.88	H	22	4.63	H	21	4.26	H
E6 (Positive Emotion)	19	4.07	A	21	4.32	A	20	4.25	A
O1 (Fantasy)	16	4.44	A	18	4.99	A	17	4.73	A
O2 (Aesthetics)	14	4.66	A	17	5.18	A	15	5.04	A
O3 (Feelings)	18	3.62	A	20	3.69	A	19	3.78	A
O4 (Actions)	17	3.95	A	17	4.18	A	17	4.07	A
O5 (Ideas)	20	4.90	A	21	5.92	A	21	5.39	A
O6 (Values)	19	4.28	A	20	4.62	A	19	4.47	A
A1 (Trust) *	18	4.76	L	19	4.85	A	19	4.84	A
A2 (Straightforwardness)	18	4.26	A	19	4.45	A	19	4.35	A
A3 (Altruism)	22	5.10	A	24	12.02	A	22	8.78	A
A4 (Compliance) *	17	3.59	A	16	3.71	L	17	3.65	A
A5 (Modesty)	17	4.01	A	17	4.66	A	17	4.28	A
A6 (Tender Mindedness)	18	3.81	A	19	3.88	A	19	3.87	A
C1 (Competence)	23	4.24	A	23	4.62	A	23	4.39	A
C2 (Order)	19	3.48	A	20	3.51	A	19	3.51	A
C3 (Dutifulness)	23	4.22	A	24	4.01	A	23	4.14	A
C4 (Achievement Striving) *	22	4.19	H	21	4.99	A	21	4.54	A
C5 (Self Discipline)	23	4.21	A	22	4.37	A	22	4.30	A
C6 (Deliberation)	18	4.10	A	18	4.39	A	18	4.20	A

Note. Rankings: L = Low; A = Average; H = High. Rankings based on the normative scales provided by Costa and McCrae (1992). N1 – N6 = Neuroticism Facets; E1 – E6 = Extraversion Facets; O1 – O6 = Openness Facets; A1 – A6 = Agreeableness Facets; C1 – C6 = Conscientiousness Facets.
* = Difference in ranking between WOs and Officers.

Table 7

Career Aviator NEO-PI-R Factor Scores

	N	E	O	AG	CO
Number	75	75	75	75	75
Mean	62.77	116.55	98.47	116.51	132.91
Median	63.00	117.00	99.00	117.00	133.00
Mode	65.00	105.00	82.00	121.00	133.00
Std. Dev.	18.54	18.59	17.43	16.25	18.09
Skewness	.54	-.18	.080	-.24	-.11
Rank	Low	Average	Low	Average	Average

Note. Factor names: N = Neuroticism; E = Extraversion; O = Openness; AG = Agreeableness; CO = Conscientiousness. The average range of scores is provided by Costa and McCrae (1992): Neuroticism (65-86); Extraversion (99-118); Openness (101-119); Agreeableness (112-128); Conscientiousness (115-133).

Table 8 presents the mean factor scores for both the incoming students and the career aviators, for ease of comparison. The students scored in the Average range on Neuroticism and Openness while the career aviators were Low on these factors. The students scored in the Low range on Agreeableness and the High range on Extraversion, while the career aviators were Average on these factors.

Table 8

Mean Factor Scores for Student and Career Aviators

	Student Aviators (*n* = 196)			Career Aviators (*n* = 75)		
	M	*SD*	Rank	*M*	*SD*	Rank
Neuroticism *	68	19.03	A	63	18.54	L
Extraversion *	120	16.84	H	117	18.59	A
Openness *	108	17.43	A	98	17.43	L
Agreeableness *	111	16.67	L	117	16.25	A
Conscientiousness	128	18.53	A	133	18.09	A

Note. Rankings: L = Low; A = Average; H = High. The average range of scores is provided by Costa and McCrae (1992): Neuroticism (65-86); Extraversion (99-118); Openness (101-119); Agreeableness (112-128); Conscientiousness (115-133).
* = Difference in ranking between Student Aviators and Career Aviators.

As stated earlier, the incoming student sample can be divided into Warrant Officers and Commissioned Officers. The mean factor scores for these two sub-groups are presented along with the career aviator factor scores in Table 9, for ease of comparison. Across the three groups, differences were found on every factor except Conscientiousness, which was consistently in the Average range.

Table 9

Mean Factor Scores for Warrant Officer Students, Officer Students, and Career Aviators

	Warrant Officers (*n* = 114)			Officers (*n* = 82)			Career Aviators (*n* = 75)		
	M	*SD*	Rank	*M*	*SD*	Rank	*M*	*SD*	Rank
Neuroticism *	66	19.19	A	71	18.54	A	63	18.54	L
Extraversion *	116	15.23	A	124	17.98	H	117	18.59	A
Openness *	105	15.95	A	113	18.18	A	98	17.43	L
Agreeableness *	111	15.37	L	113	18.21	A	117	16.25	A
Conscientiousness	128	18.42	A	129	18.77	A	133	18.09	A

Note. The average range of scores is provided by Costa and McCrae (1992): Neuroticism (65-86); Extraversion (99-118); Openness (101-119); Agreeableness (112-128); Conscientiousness (115-133).
* = Difference in ranking among student and career samples.

The mean facet scores for the total sample of incoming student aviators and the career aviators are presented in Table 10. Ranking differences between the Student Aviators and Career Aviators were found on the facets of Vulnerability, Excitement Seeking, Aesthetics, Compliance, Competence, and Achievement Striving. The Career Aviators scored in the Low range on Vulnerability, Aesthetics, and Compliance, while the Student Aviators scored in the Average range. The Career Aviators scored in the High range on Competence and Achievement Striving, while the Student Aviators scored in the Average range. The Student Aviators scored in the High range on Excitement Seeking, while the Career Aviators scored in the Average range.

Facet scores for the two types of students (WO and Commissioned Officer) are presented with Career Aviators for ease of comparison in Table 11. Differences in ranking among the two student sub-samples and the Career Aviators were found on the facets of Vulnerability, Gregariousness, Excitement Seeking, Aesthetics, Trust, Compliance, Competence, and Achievement Striving. On the facets of Vulnerability and Aesthetics, the Career Aviators scored in the Low range, while both student sub-samples scored in the Average range. The Career Aviators scored in the High range on Competence, while both student sub-samples scored in the Average range. The Commissioned Officer Students scored in the High range on Gregariousness, while other two groups scored in the Average range. The WO Students scored in the Low range on Trust, while the other two groups scored in the Average range. On Excitement Seeking, the Career Aviators scored in the Average range while two Student groups scored in the High range. On Achievement Striving, the Officer Students scored in the Average range, while the other two groups scored in the High range.

Table 10

NEO-PI-R Facet Means for Student Aviators and Career Aviators

Facet	Student Aviators			Career Aviators		
	M ($n = 196$)	SD	Rank	M ($n = 75$)	SD	Rank
N1 (Anxiety)	12	4.41	A	11	4.35	A
N2 (Angry Hostility)	12	4.94	A	11	4.32	A
N3 (Depression)	11	5.40	A	9	3.96	A
N4 (Self Consciousness)	13	4.23	A	12	4.39	A
N5 (Impulsiveness)	14	4.81	A	14	3.86	A
N6 (Vulnerability) *	9	5.20	A	6	3.55	L
E1 (Warmth)	22	4.80	A	22	4.58	A
E2 (Gregariousness)	18	4.80	A	17	5.22	A
E3 (Assertiveness)	19	4.14	H	20	4.36	H
E4 (Activity)	20	3.84	H	20	3.89	H
E5 (Excitement Seeking) *	21	4.26	H	19	3.79	A
E6 (Positive Emotion)	20	4.25	A	19	4.34	A
O1 (Fantasy)	17	4.73	A	15	4.32	A
O2 (Aesthetics) *	15	5.04	A	13	4.94	L
O3 (Feelings)	19	3.78	A	18	4.47	A
O4 (Actions)	17	4.07	A	15	3.53	A
O5 (Ideas)	21	5.39	A	18	5.05	A
O6 (Values)	19	4.47	A	19	4.29	A
A1 (Trust)	19	4.84	A	21	4.42	A
A2 (Straightforwardness)	19	4.35	A	19	4.32	A
A3 (Altruism)	22	8.78	A	23	3.88	A
A4 (Compliance) *	17	3.65	A	16	4.23	L
A5 (Modesty)	17	4.28	A	18	4.74	A
A6 (Tender Mindedness)	19	3.87	A	19	3.98	A
C1 (Competence) *	23	4.39	A	25	3.53	H
C2 (Order)	19	3.51	A	20	3.93	A
C3 (Dutifulness)	23	4.14	A	25	5.04	A
C4 (Achievement Striving) *	21	4.54	A	22	4.08	H
C5 (Self Discipline)	22	4.30	A	23	3.82	A
C6 (Deliberation)	18	4.20	A	18	4.32	A

Note. The average range of scores is provided by Costa and McCrae (1992): Rankings: L = Low; A = Average; H = High. Rankings based on the normative scales provided by Costa and McCrae (1992). N1 – N6 = Neuroticism Facets; E1 – E6 = Extraversion Facets; O1 – O6 = Openness Facets; A1 – A6 = Agreeableness Facets; C1 – C6 = Conscientiousness Facets. * = Difference in ranking between Student Aviators and Career Aviators.

Table 11

Mean Facet Scores for Warrant Officer Students, Officer Students, and Career Aviators

Facet	Warrant Officers			Officers			Career Aviators		
	M (*n* = 114)	*SD*	Rank	*M* (*n* = 82)	*SD*	Rank	*M* (*n* = 75)	*SD*	Rank
N1 (Anxiety)	12	4.60	A	12	4.11	A	11	4.35	A
N2 (Angry Hostility)	12	4.63	A	11	4.28	A	11	4.32	A
N3 (Depression)	10	5.01	A	12	5.73	A	9	3.96	A
N4 (Self Consciousness)	12	4.64	A	13	3.59	A	12	4.39	A
N5 (Impulsiveness)	14	4.28	A	15	5.41	A	14	3.86	A
N6 (Vulnerability) *	9	5.32	A	9	5.03	A	6	3.55	L
E1 (Warmth)	21	10.09	A	22	5.15	A	22	4.58	A
E2 (Gregariousness) *	18	4.82	A	19	4.54	H	17	5.22	A
E3 (Assertiveness)	19	3.76	H	20	4.64	H	20	4.36	H
E4 (Activity)	20	3.61	H	20	4.15	H	20	3.89	H
E5 (Excitement Seeking) *	20	3.88	H	22	4.63	H	19	3.79	A
E6 (Positive Emotion)	19	4.07	A	21	4.32	A	19	4.34	A
O1 (Fantasy)	16	4.44	A	18	4.99	A	15	4.32	A
O2 (Aesthetics) *	14	4.66	A	17	5.18	A	13	4.94	L
O3 (Feelings)	18	3.62	A	20	3.69	A	18	4.47	A
O4 (Actions)	17	3.95	A	17	4.18	A	15	3.53	A
O5 (Ideas)	20	4.90	A	21	5.92	A	18	5.05	A
O6 (Values)	19	4.28	A	20	4.62	A	19	4.29	A
A1 (Trust) *	18	4.76	L	19	4.85	A	21	4.42	A
A2 (Straightforwardness)	18	4.26	A	19	4.45	A	19	4.32	A
A3 (Altruism)	22	5.10	A	24	12.02	A	23	3.88	A
A4 (Compliance) *	17	3.59	A	16	3.71	L	16	4.23	L
A5 (Modesty)	17	4.01	A	17	4.66	A	18	4.74	A
A6 (Tender Mindedness)	18	3.81	A	19	3.88	A	19	3.98	A
C1 (Competence) *	23	4.24	A	23	4.62	A	25	3.53	H
C2 (Order)	19	3.48	A	20	3.51	A	20	3.93	A
C3 (Dutifulness)	23	4.22	A	24	4.01	A	25	5.04	A
C4 (Achievement Striving) *	22	4.19	H	21	4.99	A	22	4.08	H
C5 (Self Discipline)	23	4.21	A	22	4.37	A	23	3.82	A
C6 (Deliberation)	18	4.10	A	18	4.39	A	18	4.32	A

Note. The average range of scores is provided by Costa and McCrae (1992): Rankings: L = Low; A = Average; H = High. Rankings based on the normative scales provided by Costa and McCrae (1992). N1 – N6 = Neuroticism Facets; E1 – E6 = Extraversion Facets; O1 – O6 = Openness Facets; A1 – A6 = Agreeableness Facets; C1 – C6 = Conscientiousness Facets.
* = Difference in ranking among student and career samples.

Discussion

Student Personality Profiles

The findings related to the first research question produced a personality profile for a sample of male incoming student U.S. Army aviators waiting to begin Initial Entry Rotary-Wing training at Fort Rucker, Alabama. The total sample of student aviators scored in the average range on three of the five FFM factors. Agreeableness was in the low range, and Extraversion was in the high range. This profile suggests that these student aviators, although outgoing and assertive, are more concerned with individualism and improving individual competence than maintaining social relationships that consume their time and energy. However, dividing the sample by the two types of students suggested that there were actually two different personality profiles operating in this sample.

Warrant Officers were in the average range on every factor except Agreeableness. Agreeableness scores were in the low range. Low Agreeableness suggests that these aviators might value developing individual competency rather than seeking to build collaborative relationships that promote teamwork. Low Agreeableness has been found in career aviators assigned to Attack rotary-wing aircraft such as the Apache series helicopters (Grice & Katz, 2006).

Commissioned Officers in the student sample were in the average range on four of the five factors. Extraversion was the exception and scores were in the high range. The profile for these aviators indicates that they are not unlike people in the general public except in traits related to Extraversion. These aviators are likely outgoing, confident, excitement-oriented, and assertive. This profile would be consistent with the anecdotal descriptions of military aviators often found in movies such as *Top Gun*.

The facet scores for the total sample of student aviators indicated that they were average on all facets that comprise Neuroticism, Openness, Agreeableness, and Conscientiousness. Three of the Extraversion facets (i.e., Warmth, Gregariousness, and Positive Emotion) were in the average range, but the students scored high on Assertiveness, Activity, and Excitement Seeking. The facet findings for the total sample of student aviators indicated that they are similar to the general public in most of the FFM facets. However, the three Extraversion facets reporting in the high range indicates that these student aviators are active and goal driven. They likely enjoy risk and excitement.

Comparison of Student Aviators to Career Aviators

The second research question involved a comparison of incoming Student Aviators to Career Aviators and revealed several differences.   Factor differences were found in Neuroticism, Extraversion, Openness, and Agreeableness. Facet-level comparisons were conducted to more clearly understand the factor-level differences.

Student Aviators were in the average range in Neuroticism while Career Aviators scored low in this factor. This finding suggests that Career Aviators are more emotionally stable and

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more able to mitigate stress than the general public and the Student Aviators. Facet-level comparisons clarified that the difference on this component lies in the low ranking of Career Aviators in terms of Vulnerability. This indicates that the Career Aviators perceive themselves as more capable of handling themselves in difficult situations. It is possible that those who are more able to handle difficult situations are more likely to achieve longevity in the career of military aviation, but it is also possible that on-the-job experience over time has increased the Career Aviators' perceptions of their ability to handle stress, relative to the incoming students.

The Student Aviators scored high in Extraversion, compared to the Career Aviators' average ranking, suggesting that the students are more outgoing, confident, excitement-oriented, and assertive than the Career Aviator sample. The facet-level comparison here found that the sole difference was in Excitement Seeking. Thus, the Student Aviators are more likely to crave excitement and stimulation, similar to sensation seeking, while the Career Aviators are more comfortable with a relaxed tempo. This finding is consistent with anecdotal reports and survey results from previous research addressing career longevity and aircraft transitions in Army aviation (Grice & Katz, 2006) indicating that incoming, younger, aviators are more likely to seek action-oriented missions, such as attack, while more experienced (and older) aviators are more likely to prefer a slower operational tempo.

Student aviators were in the average range in Openness, while Career Aviators scored low in this factor. This finding would seem to suggest that Career Aviators are more committed to following standing operating procedures rather than engaging in novel problem-solving or attempting to deviate from Army aviation policies. However, facet-level comparisons indicated that the sole difference on this component lies in the low ranking of Career Aviators in terms of Aesthetics, meaning that they are relatively insensitive to and uninterested in art and beauty. Thus, while the factor-level difference would appear to have interesting implications for Army aviation, the facet-level comparison reveals its practical insignificance.

Causes of Student Versus Career Aviator Differences

There are several plausible explanations for the differences found between the incoming student aviators of today and career aviators who entered military service two decades ago. First, differences could be due to a sorting effect over the years as aviators with personality traits that are not conducive to Army aviation have either chosen to attrite or were eliminated from military service. A sorting effect would suggest that there might be a link between personality and interest in maintaining a career in Army aviation (i.e., career satisfaction) as well as a possible link with performance as an aviator. Since career aviators are expected to become leaders at some level, leadership abilities might be the moderating factor in this hypothesized sorting effect. That is, those aviators who demonstrate a high degree of emotional stability (like the Career Aviator sample in this investigation) might be those individuals who are most capable of assuming the leadership roles expected of career Army aviators.

Second, the personality of incoming students today might be different than it was 20 years ago, when our Career Aviator sample first entered the field. These differences might be due to a different type of applicant or to changes in Army aviation, or both. For instance, the

Army has traditionally not required a college education in order to be an aviator, but many of the student aviators in our research had obtained college credits or degrees. Changes have occurred in Army aviation with the development of new technologies and aircraft that require a high level of technical skill. The tasks of Army aviators have changed, with an ever-increasing need for situational awareness abilities, problem solving skills, and multi-tasking aptitudes. Because of the current international climate, many incoming Army aviators today will be called upon to fly in combat conditions. These changes may attract and/or require a different type of personality today than it did two decades ago.

Third, differences may be due to an adaptation effect. The organizational environment of Army aviation may exert sufficient pressure to cause an adaptation in personality trait levels. For example, the student aviators were in the average range on Neuroticism while career aviators scored low on this factor. This difference suggests that career aviators are likely better able to remain emotionally stable and to mitigate stress than the student aviators. This might point to an adaptation effect in which the career aviators have developed the necessary skills that will lower Neuroticism. Similarly, the Neuroticism facet of Vulnerability was average for the students and low for career aviators. This might indicate that career aviators have developed a greater sense of self-confidence than the student aviators. Another example would be that student aviators scored high in the Extraversion facet of Excitement Seeking and career aviators were in the average range. Lower Excitement Seeking for career aviators suggests they are not as likely to take unnecessary risks in the cockpit, remaining compliant with the established limits and guidelines of Army aviation. Thus, like exercising a muscle repeatedly over time, it may be that career Army aviators gradually strengthen those parts of their personalities that are conducive to a career in Army aviation.

Recommendations

Much research could be done in the future involving the personality profiles of Army aviators. Research could investigate possible correlations between personality factors and aviator performance. The identification of a relationship between personality and performance would support using personality constructs as criteria for consideration in aviator training selection. Links have been reported between FFM traits and performance among Navy and Air Force aviators (e.g., Anesgart & Callister, 2001; Vickers, 1995). While the research reported herein suggests those personality factors associated with longevity in Army aviation today, no empirical findings are currently available that identify a direct relationship between personality and performance in Army aviation.

Research could examine whether personality should be included as a part of selection criteria for new applicants to flight training or in classifying aviators into aircraft. Person-environment fit theory posits that when people perceive that their personal characteristics (e.g., interests, personality) match the demands of an environment (e.g., work) they will be more likely to exhibit high performance and seek retention. Research should investigate if personality traits can predict performance in flight training and if a relationship exists between particular personality profiles and the different Army rotary-wing aircraft and associated missions. The NEO-PI-R represents possibly the best instrument to use for this purpose because it is well-validated and designed to measure normal dimensions of personality rather than

psychopathology. The traits covered by the NEO-PI-R can be used in matching personality with vocational interests, and might be useful in matching student aviators with assigned missions.

The personality differences revealed when comparing Warrant Officer students to Commissioned Officer students deserves further research. Warrant Officers are likely to vary widely in terms of age and maturity level, because they comprise those individuals choosing to pursue Army aviation immediately after completing High School as well as those older individuals already in the Army who decide to pursue a career in aviation. By contrast, Commissioned Officers typically enter Army aviation after completing a college education, so they tend to be in their early 20s, with similar educational backgrounds. Follow-up research might explore these differences in terms of recruiting strategies, aircraft/mission classification, and retention practices among the two populations. For example, if the finding that Warrant Officers value developing individual competency rather than seeking to build collaborative relationships is replicated with larger samples, the Army may benefit by emphasizing teamwork training and Crew Coordination principles with these students. If the finding that Commissioned Officers tend to value excitement-seeking, the Army may benefit by assigning these students to Attack aircraft and missions requiring a higher operational tempo, which would consequently optimize job satisfaction and career retention.

Longitudinal research could investigate whether or not (and to what extent) the personality trait levels of Army aviators change over time. Part of the motivation for assessing the trait levels of career aviators was to identify the personality profile that seems to be associated with several years of military service. The shortcoming was that we did not have NEO-PI-R results from this sample at the beginning of their careers. A longitudinal design that follows Army aviators throughout their tenure could help us to sort out the dynamics associated with the differences found in the current investigation. That is, do those who exhibit less "fit" with Army aviation eventually attrite from this career path? Do aviators' trait levels adapt to the organizational environment of Army aviation? Do personality traits remain stable, while the personalities of applicants and/or selected students have changed over the past 20 years? The answers to these questions could help us to identify the personality profiles of those most likely to make a career of Army aviation, and thus minimize the unnecessary expenditure of training resources.

Finally, the personality profiles of female aviators could be the topic of future research. Females historically make up a relatively small portion of Army aviators. However, little is known about the personality traits of these aviators, and increasing our breadth of knowledge in this area might contribute to improved recruitment, selection, and retention of these personnel. Females will continue to serve as Army aviators and investigating possible links between their personality trait levels and aviation profession-related parameters (e.g., performance, career satisfaction, and tenure) appears to offer a potentially fruitful avenue for future research.

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APPENDIX A

Student Demographic Form

1. Age _____   2. Years of military service _____

3. Gender (Circle): Male   Female   4. Rank _____

5. Prior Military Service? (Circle One)   Yes   or   No

   A. If so, which branch _____

6. Prior Aviation Experience? (Circle One)   Yes   or   No

   A. If so, what

7. Highest Level of Education

   A. high school graduate
   B. some college
   C. vocational/technical college
   D. college graduate

8. Which type of mission would you prefer as your initial field assignment?

   A. Attack
   B. Reconnaissance/Scout
   C. Utility
   D. Cargo