



AFRL-SA-WP-TR-2011-0008

COMPILATION OF PILOT PERSONALITY NORMS



Raymond E. King

U.S. Air Force School of Aerospace Medicine

Erica Barto, Malcolm James Ree, Mark S. Teachout

Operational Technologies Corp., San Antonio, TX



July 2011

**Final Report
for March 1994 to May 2011**

**Distribution Statement A: Approved for
public release; distribution is unlimited.
Case Number: 88ABW-2011-6635,
29 Dec 2011**

**Air Force Research Laboratory
711th Human Performance Wing
School of Aerospace Medicine
Aeromedical Research Department
2510 Fifth St.
Wright-Patterson AFB, OH 45433-7913**

NOTICE AND SIGNATURE PAGE

Using Government drawings, specifications, or other data included in this document for any purpose other than Government procurement does not in any way obligate the U.S. Government. The fact that the Government formulated or supplied the drawings, specifications, or other data does not license the holder or any other person or corporation or convey any rights or permission to manufacture, use, or sell any patented invention that may relate to them.

Qualified requestors may obtain copies of this report from the Defense Technical Information Center (DTIC) (<http://www.dtic.mil>).

AFRL-SA-WP-TR-2011-0008 HAS BEEN REVIEWED AND IS APPROVED FOR PUBLICATION IN ACCORDANCE WITH ASSIGNED DISTRIBUTION STATEMENT.

//SIGNATURE//

William Dodson, MD, Chief/FHC

//SIGNATURE//

David L. Maserang, Ph.D., Chair/FH

This report is published in the interest of scientific and technical information exchange, and its publication does not constitute the Government's approval or disapproval of its ideas or findings.

REPORT DOCUMENTATION PAGE				<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 01-07-2011		2. REPORT TYPE Final Technical Report		3. DATES COVERED (From – To) March 1994 – May 2011	
4. TITLE AND SUBTITLE Compilation of Pilot Personality Norms				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Raymond E. King, Erica Barto, Malcolm James Ree, Mark S. Teachout				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) USAF School of Aerospace Medicine Aeromedical Research/FHC 2510 Fifth St. Wright-Patterson AFB, OH 45433-7913				8. PERFORMING ORGANIZATION REPORT NUMBER AFRL-SA-WP-TR-2011-0008	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSORING/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Distribution Statement A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2011-6635, 29 Dec 2011					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT Aviators are a highly selected and distinguished occupational group, with Air Force pilots being at or near the apex. In this high-risk profession, errors can lead to significant costs in terms of human life, international relations, and national security. Furthermore, human error is often a causal factor in pilot training and mission-related aviation mishaps. Due to these high costs and risks, an understanding of the personality characteristics of pilots is a critical part of the selection process and the aeromedical waiver process. Because pilot scores are usually very high on desirable qualities and low on undesirable qualities, nationally representative norms can be misleading. Changes in scores towards the nationally normed mean could indicate a serious decrement. This decrement, although reducing the pilot to the average range when compared to the general population, may be an indication that flying duties will not be performed safely and effectively. Pilot training candidates were administered the Armstrong Laboratory Aviation Personality Survey, the NEO Personality Inventory-Revised, and the Personality Assessment Inventory prior to the 53 wk of Specialized Undergraduate Pilot Training. Descriptive statistics were computed for the scales of the three tests for men, women, and the combined sample. Percentile tables were then created to show the percentile corresponding to a particular raw score on each scale. Profile sheets were also created to show the T-score corresponding to a raw score for the pilot sample to help clinicians chart an individual's scores. This allows for a better comparison of the aviator to a pool of aviators. Vignettes are included to illustrate the utility of these normative tables for clinical and occupational evaluation. A forthcoming study will present similar analyses for cognitive ability tests.					
15. SUBJECT TERMS Personality assessment, personality characteristics of pilots, cognitive ability					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 59	19a. NAME OF RESPONSIBLE PERSON Lt Col Raymond E. King
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			19b. TELEPHONE NUMBER (include area code)

This page intentionally left blank.

TABLE OF CONTENTS

Section	Page
1.0 SUMMARY	1
2.0 INTRODUCTION	1
3.0 ARMSTRONG LABORATORY AVIATION PERSONALITY SURVEY	3
3.1 Method	4
3.1.1 Participants.....	4
3.1.2 Measure.....	4
3.1.3 Procedure	4
3.2 Results.....	4
4.0 THE NEO PERSONALITY INVENTORY-REVISED.....	8
4.1 Method	8
4.1.1 Participants.....	8
4.1.2 Measure.....	8
4.1.3 Procedure	8
4.2 Results.....	9
5.0 THE PERSONALITY ASSESSMENT INVENTORY.....	17
5.1 Method	17
5.1.1 Participants.....	17
5.1.2 Measure.....	18
5.1.3 Procedure	21
5.2 Results.....	21
6.0 DISCUSSION	35
7.0 CONCLUSION.....	36
8.0 REFERENCES	37
APPENDIXES	
A – ALAPS Profile Sheets.....	38
B – NEO PI-R Profile Sheets.....	41
C – PAI Profile Sheets	47
LIST OF ABBREVIATIONS AND ACRONYMS	53

LIST OF TABLES

Table	Page
1 Definitions and Reliabilities of the ALAPS Scales	5
2 Means and Standard Deviations of the ALAPS Scales	6
3 Percentile Equivalence for Crew Interaction Scales on the ALAPS	6
4 Percentile Equivalence for Personality Scales on the ALAPS	7
5 Percentile Equivalence for Psychopathology Scales on the ALAPS	7
6 Domain Definitions and Reliabilities of the NEO PI-R.....	9
7 NEO PI-R Domain and Facet T-Score Means and Standard Deviations.....	10
8 Percentiles for NEO PI-R Domain Scales	11
9 Percentiles for <i>Neuroticism</i> Facet Scales.....	13
10 Percentiles for <i>Extraversion</i> Facet Scales.....	14
11 Percentiles for <i>Openness to Experience</i> Facet Scales.....	15
12 Percentiles for <i>Agreeableness</i> Facet Scales	16
13 Percentiles for <i>Conscientiousness</i> Facet Scales.....	17
14 Scale/Subscale Definitions and Reliabilities of the PAI.....	18
15 PAI Scale and Subscale T-Score Means and Standard Deviations.....	22
16 Percentiles for Validity Scales of the PAI	24
17 Percentiles for the Somatic Complaints Scale and Subscales of the PAI.....	24
18 Percentiles for the Anxiety Scale and Subscales of the PAI.....	25
19 Percentiles for the Anxiety-Related Disorders Scale and Subscales of the PAI.....	26
20 Percentiles for the Depression Scale and Subscales of the PAI.....	27
21 Percentiles for the Mania Scale and Subscales of the PAI	28
22 Percentiles for the Paranoia Scale and Subscales of the PAI.....	29
23 Percentiles for the Schizophrenia Scale and Subscales of the PAI.....	30
24 Percentiles for the Borderline Features Scale and Subscales of the PAI.....	31
25 Percentiles for the Antisocial Features Scale and Subscales of the PAI.....	32
26 Percentiles for the Alcohol Problems and Drug Problems Scales of the PAI	33
27 Percentiles for the Aggression Scale and Subscales of the PAI	33
28 Percentiles for the Suicide, Stress, Nonsupport Scales of the PAI	34
29 Percentiles for the Treatment Rejection, Dominance, and Warmth Scales of the PAI	35

1.0 SUMMARY

Assessment of human characteristics is based on comparing an individual to a representative sample. This process allows comparisons to be made between individuals on the distribution of values of a particular characteristic of interest, such as personality. Aviators are a highly selected and distinguished occupational group, with Air Force pilots being at or near the apex. In this high-risk profession, errors can lead to significant costs in terms of human life, international relations, and national security. Furthermore, human error is often a causal factor in pilot training and mission-related aviation mishaps. Due to these high costs and risks, an understanding of the personality characteristics of pilots is a critical part of the selection process and the aeromedical waiver process. Because pilot scores are usually very high on desirable qualities and low on undesirable qualities, nationally representative norms can be misleading. Changes in scores towards the nationally normed mean could indicate a serious decrement. This decrement, although reducing the pilot to the average range when compared to the general population, may be an indication that flying duties will not be performed safely and effectively. A sample of 19,361 pilot training candidates was administered the Armstrong Laboratory Aviation Personality Survey, a sample of 12,702 pilot training candidates was administered the NEO Personality Inventory-Revised, and a sample of 1,309 pilot training candidates was administered the Personality Assessment Inventory prior to the 53 wk of Specialized Undergraduate Pilot Training. Descriptive statistics (means and standard deviations) were computed for the scales of the three tests for men, women, and the combined sample. Percentile tables were then created to show the percentile corresponding to a particular raw score on each scale. Profile sheets were also created to show the T-score corresponding to a raw score for the pilot sample to help clinicians chart an individual's scores. This allows for a better comparison of the aviator to a pool of aviators. Vignettes are included to illustrate the utility of these normative tables for clinical and occupational evaluation. A forthcoming study will present similar analyses for cognitive ability tests.

2.0 INTRODUCTION

Any assessment of human characteristics is based on comparing an individual to a representative sample of the general population. This process allows comparisons to be made between individuals on the distribution of values of a particular characteristic of interest. Not only is this process commonplace in organizations (for example, deciding whom to hire or promote), it is found in less formal situations, for example, deciding whom to befriend. Certain subsets of the general population vary dramatically from the population at large. For example, groups can be distinguished on the basis of individual achievement – high school dropout or graduate, college graduate, holder of an advanced degree. Moreover, differences in personality may be found in broad occupational groups. For example, some members of an occupational group are easy going while others are not. Whether or not these personality differences have any impact on success in an occupation is an ongoing question. In any case, the demands of the occupation must be considered. Aviators are a highly selected and distinguished occupational group, with Air Force pilots being at or near the pinnacle. The stakes are high: In this high-risk profession, errors can lead to significant costs in terms of human life, international relations, and national security. Furthermore, human error is often a causal factor in pilot training and mission-related aviation mishaps. Due to the high costs of military aviation training and the high-risk

nature of military flying, an understanding of the personality characteristics of pilots is a critical part of the selection process as well as the aeromedical waiver process for consideration of return to flying duties after a psychiatric illness.

The United States Air Force (USAF) collects cognitive and personality testing data prior to entry into pilot training (Ref 1). Currently, the mandatory battery is composed of four tests: the Multidimensional Aptitude Battery-Second Edition (MAB-II), the MicroCog, the Personality Assessment Inventory (PAI), and the Revised NEO Personality Inventory (NEO PI-R). Previously, the original MAB and CogScreen and the Armstrong Laboratory Aviation Personality Survey (ALAPS) (Ref 2,3) were administered and the results archived. These premorbid (Ref 4) measures are highly useful in the comprehensive clinical and neuropsychological evaluations that occur at the Aeromedical Consultation Service (ACS) of the USAF School of Aerospace Medicine when aviators are being considered for return to flying duties after receiving a medically disqualifying diagnosis. The archived scores on these measures can be compared to the aviator's current functioning when seeking a waiver to the medical standards outlined in Air Force Instruction 48-123.

Specifically, how do psychological data collected on a nonreferred basis aid in *future* clinical assessments? A baseline of scores for each pilot candidate is created prior to that pilot entering training to serve as an accurate assessment of his or her premorbid cognitive and personality functioning. This baseline evaluation is done during Medical Flight Screening prior to entering pilot training. These baseline scores are archived, to be used for comparison should the pilot need to undergo a psychological or neuropsychological evaluation during or after training. During the clinical assessment to determine fitness to return to flying duties, an aeromedical psychologist must determine if there are any changes in a pilot's or pilot candidate's cognitive or personality functioning that would raise concerns if he or she were to return to flying.

Clinically assessing aviators with a history of a psychiatric illness or a neurological insult can be difficult, as these typically high-functioning men and women retain abilities well above the general population, even when impaired. Obviously, the risk of returning an impaired aviator to flying must be minimized. Because subtle changes in a pilot's cognitive functioning can cause disqualification from flying, aeromedical evaluations are highly sensitive. Therefore, having an accurate baseline of the cognitive functioning and personality of pilots is critical to their future, the aeromedical waiver process, and mission readiness.

The empirical material in test manuals is based on a representative sample of the general population. Clinical psychological and neuropsychological evaluation of USAF pilots, however, requires occupation-specific normative data. These pilots are not representative of the general population but are a highly screened and selected group. Therefore, compiling pilot norms may be useful to augment those compiled on the general population.

The problem with using nationally representative norms with the pilot group is that pilot scores are usually very high and can fall toward the mean of the nationally representative sample, suggesting that no clinical issue exists. However, given the generally extreme scores of USAF pilots, changes in scores towards the nationally normed mean could indicate a serious decrement. This decrement, although reducing the pilot to the average range when compared to the general population, may be an indication that flying duties will not be performed safely and effectively.

So, while the best circumstance is to have premorbid data on an individual, having norms collected from a cohort can still provide useful information. For example, say a pilot achieves a performance intelligence quotient (PIQ) of 105 on the MAB-II after a closed head injury. While

this value is in the normal range when compared to the general population (IQs are normed to have a mean of 100 and a standard deviation of 15), it is low (as will be demonstrated in a companion report) compared to pilots and may be indicative of a loss of neurocognitive functioning. Having a PIQ that was obtained from this individual before injury is invaluable. Similarly, a psychologically well-adjusted pilot with a 95th percentile score on emotional stability (or, conversely, a low score on “neuroticism” – a tendency toward emotional *instability*) that falls to the 60th percentile may be showing signs of a psychopathological condition or evidence of deteriorating interpersonal adjustment. Moreover, the change from high to average may forecast unsuccessful pilot behavior. This knowledge may lead to improved psychological evaluation and appropriate decisions regarding flying status and other duties. Therefore, this manuscript presents a collection of normative tables specifically developed on USAF pilot trainees (who are in the pipeline to become pilots). Use of these tables, in addition to, or in lieu of, commercially published norms, will prove helpful when psychologists perform clinical assessments on pilots. This manuscript reports only on personality tests. A subsequent companion manuscript will report on the cognitive tests.

It should be noted that this type of ambitious undertaking is not new: Drs. Paul M. Fine and Bryce O. Hartman published *Psychiatric Strengths and Weaknesses of Typical Air Force Pilots* in 1968 (Ref 5). Their compiled norms on the Minnesota Multiphasic Personality Inventory (MMPI) were subsequently transformed into a profile sheet and were used during aeromedical assessments at the ACS until the ACS adopted the revised version of the MMPI (the MMPI-2) in 1991. Currently, research is being conducted at the ACS to specifically update the Fine and Hartman norms, using the recently introduced reformatted form of the MMPI (MMPI-2-RF). It should also be noted that some select-out tests must be used with a great deal of caution, if at all. King (Ref 6) demonstrated that the Millon Clinical Multiaxial Inventory, a test of fitness that attempts to directly identify conditions delineated in the *Diagnostic and Statistical Manual of Mental Disorders*, grossly overestimates some forms of personality psychopathology in aviators.

In considering the issue of fitness for duty of aviators (to include pilots, air traffic controllers, and other key aviation industry personnel), Kay asserted that “there is no excuse for inexactness in the evaluation of individuals in these safety-critical occupations” (Ref 7, p. 228). This report is the authors’ attempt to mitigate one obstacle classically confronted by the professionals who attempt to assess those who are typically high functioning. It should be noted, however, that the circumstances surrounding testing must be seriously considered, as self-report measures are notoriously vulnerable to various forms of impression management, particularly by members of the aviation professions, as documented by Williams and King (Ref 8).

Finally, it should be noted that this report addresses issues of suitability as well as issues of fitness. In other words, some of the tests included in this report are appropriate for determining who has what degree of a desirable quality (conscientiousness, for example), while other tests are appropriate for determining if someone has a disqualifying psychiatric condition. The former measures suitability and is used in select-in decisions, while the latter determines fitness and is used in select-out decisions.

3.0 ARMSTRONG LABORATORY AVIATION PERSONALITY SURVEY

The ALAPS is a 240-item, true/false test specifically developed to assess aircrew and applicants for aircrew positions. It is divided into scales that address personality,

psychopathology, and crew interaction styles. The ALAPS was originally normed (Ref 2) and cross validated (Ref 3) on student pilots, so the current effort updates those norms.

3.1 Method

3.1.1 Participants. A sample of 19,361 pilot training candidates was administered the ALAPS prior to the 53 wk of Specialized Undergraduate Pilot Training (SUPT). All were college graduates or were near completion of college. Many had private pilot's licenses or had completed part of training for a private pilot's license including flight hours in a light aircraft. Of those reporting demographic information, 91% were men. All participants were under the age of 36, with a mean age of 23 yr, standard deviation (SD) of 2.8 yr, and modal age of 21 yr. Ethnic and racial distributions indicated that 86.8% identified themselves as white, 4.3% Hispanic, 2.2% African American, and 6.7% "other." All participants were tested at the School of Aerospace Medicine at Brooks City-Base, TX, or at the USAF Academy in Colorado Springs, CO.

3.1.2 Measure. As described above, the ALAPS, which was developed in 1996, was designed by the Air Force as a specialized personality test to serve as a selection instrument for pilots and astronauts (Ref 2). The intent was to provide an inventory with appropriate scales, established norms, high reliability, and solid validity for the aviation profession. The 240 items are administered by paper-and-pencil or computer and require participants to respond "true" or "false" to each item as it applies to them. The ALAPS has 15 scales that are categorized as "Personality," "Psychopathology," and "Crew Interaction." As noted above, due to the similar population on which it was normed (USAF student pilots), it is the instrument least in need of specialized norms. The ALAPS can be used for both suitability and fitness purposes.

Table 1 reports the previously reported (Ref 2) definitions and reliabilities for the 15 ALAPS scales. Reliabilities were calculated from a sample of 200 student pilots.

3.1.3 Procedure. Updated descriptive data (means and SDs) were computed for the scales of the ALAPS for three groups: men, women, and the combined sample. Percentile tables were then created to show the percentile corresponding to a particular raw score on each ALAPS scale. This information is displayed for men, women, and the combined sample. Finally, profile sheets were created to show the T-score corresponding to a particular raw score on the ALAPS scales for the pilot sample. These profile sheets help clinicians chart an individual's scores and allow for better interpretation, since comparisons can be made from this aviator to a pool of aviators. The profile sheets for this test are in Appendix A.

3.2 Results

Table 2 displays the descriptive statistics of the male sample, female sample, and the combined sample for the 15 scales of the ALAPS. These data were computed from the raw scores. Each scale ranges from 0 to 16.

Table 3 displays the percentile equivalence for raw scores on the Crew Interaction scales: *Dogmatism*, *Deference*, *Team Oriented*, *Organization*, *Impulsivity*, and *Risk Taking*. For each scale, raw scores and percentiles are presented for the male (M), female (W), and combined sample (C).

Table 4 displays the percentile equivalence for raw scores on the Personality scales: *Confidence*, *Socialness*, *Aggressiveness*, *Orderliness*, and *Negativity*. For each scale, raw scores and percentiles are presented for the male, female, and combined sample.

Table 5 displays the percentile equivalence for raw scores on the Psychopathology scales: *Affective Liability*, *Anxiety*, *Depression*, and *Alcohol Abuse*. For each scale, raw scores and percentiles are presented for the male, female, and combined sample.

Table 1. Definitions and Reliabilities of the ALAPS Scales

Scale	Definition	Reliability ^a
Confidence	High scorers are highly capable, intelligent, and talented.	.71
Socialness	High scorers are extremely social, outgoing, and friendly.	.85
Aggressiveness	High scorers are assertive to the point of being aggressive and do not handle criticism well.	.73
Orderliness	High scorers are orderly in a behavioral and environmental way, are structured, and neat.	.83
Negativity	High scorers are angry, negative, and cynical.	.74
Affective Liability	High scorers are emotional and reactive. They can be anxious, depressed, and frightened.	.85
Anxiety	High scorers are chronically anxious. They worry and brood which interferes with their functioning.	.86
Depression	High scorers report being pessimistic, unhappy, and guilty.	.76
Alcohol Abuse	High scorers like to drink, drink a great deal, and get intoxicated to the point that functioning is impaired.	.89
Dogmatism	High scorers are not open to change and take their beliefs to be correct.	.73
Deference	High scorers are deferent, submissive, and quiet.	.75
Team Oriented	High scorers enjoy team work and do not enjoy working alone.	.84
Organization	High scorers are systematic and organized. They coordinate and plan all elements of a project.	.83
Impulsivity	High scorers act first and think second without sufficient forethought. They see themselves as spontaneous.	.82
Risk Taking	High scorers enjoy danger and risk and are not frightened by new activities and situations.	.80

^aReliability estimated through internal consistency using coefficient alpha for a sample of 200 student pilots (Ref 2).

Table 2. Means and Standard Deviations of the ALAPS Scales

Scale	Men		Women		Combined	
	Mean	SD	Mean	SD	Mean	SD
Confidence	9.67	2.96	8.09	3.17	9.52	3.01
Socialness	12.64	3.48	12.84	3.52	12.66	3.48
Aggressiveness	9.26	3.00	8.32	3.08	9.17	3.02
Orderliness	12.10	3.50	12.54	3.43	12.13	3.50
Negativity	5.40	3.20	5.14	3.16	5.38	3.20
Affective Lability	4.36	3.64	6.76	4.37	4.57	3.77
Anxiety	2.24	3.30	3.29	4.08	2.34	3.39
Depression	1.59	2.34	1.94	2.54	1.63	2.37
Alcohol Abuse	7.45	4.00	6.45	3.95	7.35	4.01
Dogmatism	5.88	2.97	4.43	2.60	5.75	2.97
Deference	6.50	2.87	6.43	3.01	6.49	2.89
Team Oriented	11.96	3.75	11.75	3.78	11.93	3.76
Organization	12.49	3.38	12.92	3.31	12.53	3.38
Impulsivity	7.12	3.70	7.18	3.74	7.12	3.71
Risk Taking	12.36	2.86	11.48	3.37	12.28	2.92

Note: Male N=17,489; Female N=1,729; Combined sample; N=19,361.

Table 3. Percentile Equivalence for Crew Interaction Scales on the ALAPS

Raw Score	Dogmatism			Deference			Team Oriented			Organization			Impulsivity			Risk Taking		
	M	W	C	M	W	C	M	W	C	M	W	C	M	W	C	M	W	C
0	1	3	1	1	1	1							2	3	2			
1	4	11	5	3	3	3	1	1	1	1	1	1	6	7	6		1	
2	11	24	12	7	7	7	2	1	2	1	1	1	11	12	11		1	1
3	21	40	23	15	16	15	3	3	3	2	2	2	18	18	18	1	3	1
4	35	56	37	26	28	26	5	5	5	4	3	4	27	25	26	2	5	2
5	50	71	52	39	43	39	8	8	8	5	5	5	36	34	36	3	6	3
6	63	81	65	53	56	53	11	13	12	7	6	7	46	46	46	5	10	5
7	75	89	76	66	67	66	16	18	16	10	8	10	55	55	55	7	14	8
8	83	93	83	76	76	76	20	23	21	14	11	13	65	64	65	11	19	11
9	88	96	89	85	84	85	25	28	25	18	14	17	73	73	73	15	25	16
10	92	98	93	91	89	91	30	32	30	23	19	23	80	80	80	23	32	24
11	95	98	95	95	94	95	36	38	36	30	25	29	86	86	86	32	42	33
12	97	99	97	97	96	97	43	45	43	39	33	38	91	90	91	44	53	45
13	98	99	98	99	99	99	52	54	53	50	44	50	95	95	95	58	68	59
14	99		99		99		66	68	66	65	59	65	97	97	97	75	81	75
15							87	89	87	82	77	82	99	99	99	90	92	90

Note: Male N=17,489; Female N=1,729; Combined sample N=19,361.

Table 4. Percentile Equivalence for Personality Scales on the ALAPS

Raw Score	Confidence			Socialness			Aggressiveness			Orderliness			Negativity		
	M	W	C	M	W	C	M	W	C	M	W	C	M	W	C
0		1		1	1								4	6	4
1	1	2	1	1	1	1	1	1	1	1	1	1	11	13	11
2	1	5	2	2	2	2	1	3	2	2	2	2	20	22	20
3	3	9	4	3	4	3	3	6	3	4	3	4	31	34	31
4	5	15	6	5	5	5	6	11	6	5	4	5	43	45	43
5	9	21	10	6	7	6	10	18	11	7	6	7	54	57	55
6	15	30	16	8	8	8	18	28	19	10	7	9	65	68	66
7	23	41	24	10	10	10	28	40	29	12	10	12	75	78	75
8	32	52	34	13	12	13	41	53	42	15	13	15	83	85	83
9	44	65	46	16	14	16	53	65	54	19	17	19	89	90	89
10	59	77	61	20	18	20	66	75	67	25	22	25	93	94	93
11	74	86	75	26	23	26	76	84	77	32	28	31	96	97	96
12	83	93	84	34	30	33	85	91	85	42	36	41	98	99	98
13	91	96	91	45	41	44	92	96	92	55	47	54	99	99	99
14	96	99	96	61	56	61	96	98	96	72	64	71			
15	99	99	99	85	81	84	99	99	99	90	85	90			

Note: Male N=17,489; Female N=1,729; Combined sample N=19,361.

Table 5. Percentile Equivalence for Psychopathology Scales on the ALAPS

Raw Score	Affective Lability			Anxiety			Depression			Alcohol Abuse		
	M	W	C	M	W	C	M	W	C	M	W	C
0	9	3	8	41	31	40	42	37	42	6	9	6
1	25	11	23	61	49	60	67	60	66	12	16	12
2	40	20	38	72	60	71	79	72	79	16	21	17
3	52	30	50	79	67	78	86	81	85	20	27	21
4	62	39	60	83	73	82	90	86	90	25	33	25
5	69	45	67	86	78	86	93	90	93	30	39	31
6	76	52	74	89	81	88	95	93	95	37	47	38
7	81	59	79	91	85	91	96	95	96	45	56	46
8	85	65	83	93	87	92	97	97	97	56	66	57
9	89	71	87	94	89	94	98	98	98	67	76	67
10	91	77	90	96	91	95	99	99	99	76	84	77
11	94	82	93	97	93	96	99	99	99	84	91	85
12	96	87	95	98	94	97				90	95	91
13	98	91	97	98	96	98				95	97	95
14	99	95	99	99	98	99				98	99	98
15		99			99							

Note: Male N=17,489; Female N=1,729; Combined sample N=19,361.

4.0 THE NEO PERSONALITY INVENTORY-REVISED

The NEO PI-R is a 240-item measure of the Five Factor or Big Five model of personality structure, as described below. It is not a test of psychopathology; rather, it assesses normal aspects of personality, including *Neuroticism* (which gauges traits such as self-consciousness and impulsiveness, as well as anxiety and depression). The NEO PI-R was developed with the goal of being a multipurpose personality inventory useful for predicting many criteria such as behaviors related to illness, career interests, psychological health, and styles of coping (Ref 9). The NEO PI-R has become an important tool in assessing pilots because the issues of interest typically involve the suitability of a person to the job requirements (in addition to traditional mental health issues). Having occupation-specific norms helps determine whether or not a student pilot or trained pilot varies greatly from his or her peers.

4.1 Method

4.1.1 Participants. A sample of 12,702 pilot training candidates was administered the NEO PI-R prior to the 53 wk of SUPT. All were college graduates or were near completion of college. Many had private pilot's licenses or had completed part of training for a private pilot's license including flight hours in a light aircraft. Of those reporting demographic information, 92.9% were men. All participants were under the age of 35, with a mean age of 23 yr, SD of 2.6 yr, and modal age of 22 yr. Ethnic and racial distributions indicated that 88.9% identified themselves as white, 3.6% Hispanic, 2.0% African American, and 5.5% "other." All participants were tested at the School of Aerospace Medicine at Brooks City-Base, TX, or at the USAF Academy in Colorado Springs, CO.

4.1.2 Measure. The NEO PI-R, developed in 1985, measures the domains of *Neuroticism*, *Extraversion*, *Openness to Experience*, *Agreeableness*, and *Conscientiousness*. Each domain consists of six facet scores. These domains and facets, delineated below, provide a comprehensive measurement of adult personality (Ref 9). Participants are asked to respond on a Likert-type scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Table 6 provides a description of the five domain scales as well as their reliabilities in a sample of 1,539 men and women in a large organization. Reliability coefficients for the 30 facets are reported in the test manual and range from .56 to .81 (Ref 9). For the current study, the normative sample for adults served as the normative reference, and the test was administered and scored via computer. While the NEO PI-R can be used for both suitability and fitness purposes, it is mostly a measure of suitability with only one domain (*Neuroticism*) contributing to an appreciation of fitness.

4.1.3 Procedure. Descriptive data (means and SDs) were computed for the domains and facets of the NEO PI-R for the three groups: men, women, and the combined sample. Percentile tables were then created to show the percentile corresponding to a particular raw score on a NEO PI-R domain or facet. This information is displayed for men, women, and the combined sample. Finally, profile sheets were created to show the T-score corresponding to a particular raw score on the NEO PI-R domains and facets for the pilot sample. These profile sheets help clinicians chart an individual's scores and allow for better interpretation, since comparisons can be made from this aviator to a pool of aviators. The profile sheets for this test can be found in Appendix B.

Table 6. Domain Definitions and Reliabilities of the NEO PI-R

Domain	Definition	Reliability^a
Neuroticism (N)	The tendency to experience negative emotions (anger, sadness, fear) and be emotionally unstable	.92
Extraversion (E)	The enjoyment of social situations, excitement, and stimulation	.89
Openness to Experience (O)	A willingness to explore new ideas and values; desire for aesthetics	.87
Agreeableness (A)	The desire to sympathize with and help others	.86
Conscientiousness (C)	Seeking a high level of organization and planning; the tendency to plan carefully and exercise self-discipline	.90

^aReliability estimated through internal consistency using coefficient alpha for a developmental sample of 1,539 respondents (Ref 9).

4.2 Results

Table 7 displays the descriptive statistics for the domains and facets of the NEO PI-R for the male sample, female sample, and combined sample. The five domains are in bold with their six facets below.

Table 8 displays the percentile corresponding to a raw score on the domains of the NEO PI-R: *Neuroticism*, *Extraversion*, *Openness to Experience*, *Agreeableness*, and *Conscientiousness*. For each scale, percentiles are presented for the male, female, and combined sample.

Table 9 displays the percentile corresponding to a raw score on the *Neuroticism* facets of the NEO PI-R: *Anxiety*, *Angry Hostility*, *Depression*, *Self-Consciousness*, *Impulsiveness*, and *Vulnerability*. For each scale, percentiles are presented for the male, female, and combined sample.

Table 10 displays the percentile corresponding to a raw score on the *Extraversion* facets of the NEO PI-R: *Warmth*, *Gregariousness*, *Assertiveness*, *Activity*, *Excitement-Seeking*, and *Positive Emotions*. For each scale, percentiles are presented for the male, female, and combined sample.

Table 11 displays the percentile corresponding to a raw score on the *Openness to Experience* facets of the NEO PI-R: *Fantasy*, *Aesthetics*, *Feelings*, *Actions*, *Ideas*, and *Values*. For each scale, percentiles are presented for the male, female, and combined sample.

Table 12 displays the percentile corresponding to a raw score on the *Agreeableness* facets of the NEO PI-R: *Trust*, *Straightforwardness*, *Altruism*, *Compliance*, *Modesty*, and *Tender-Mindedness*. For each scale, percentiles are presented for the male, female, and combined sample.

Table 13 displays the percentile corresponding to a raw score on the *Conscientiousness* facets of the NEO PI-R: *Competence*, *Order*, *Dutifulness*, *Achievement-Striving*, *Self-Discipline*, and *Deliberation*. For each scale, percentiles are presented for the male, female, and combined sample.

Table 7. NEO PI-R Domain and Facet T-Score Means and Standard Deviations

Domain/Facet	Men		Women		Combined	
	Mean	SD	Mean	SD	Mean	SD
Neuroticism (N)	46.64	9.30	45.63	9.89	46.57	9.35
Anxiety (N1)	47.25	9.32	46.69	9.33	47.21	9.32
Angry Hostility (N2)	48.44	9.86	47.81	9.68	48.40	9.85
Depression (N3)	46.49	8.18	45.69	8.78	46.44	8.22
Self-Consciousness (N4)	46.98	9.77	46.00	10.24	46.91	9.80
Impulsiveness (N5)	48.15	10.61	48.16	10.57	48.16	10.61
Vulnerability (N6)	42.70	8.62	41.99	8.42	42.65	8.60
Extraversion (E)	57.47	9.65	56.97	9.97	57.41	9.68
Warmth (E1)	52.09	9.64	52.09	10.28	52.08	9.68
Gregariousness (E2)	55.66	10.13	54.97	11.19	55.59	10.22
Assertiveness (E3)	58.25	9.36	59.25	9.17	58.31	9.34
Activity (E4)	57.81	8.72	58.79	8.35	57.86	8.70
Excitement-Seeking (E5)	62.02	8.27	62.21	8.37	62.01	8.29
Positive Emotions (E6)	54.38	10.06	56.79	9.70	54.53	10.05
Openness to Experience (O)	50.20	10.09	55.63	9.82	50.59	10.16
Fantasy (O1)	52.09	10.52	55.21	10.15	52.32	10.52
Aesthetics (O2)	48.81	10.46	52.02	10.75	49.05	10.51
Feelings (O3)	52.29	11.02	54.06	9.67	52.40	10.94
Actions (O4)	51.91	10.51	55.20	10.44	52.15	10.54
Ideas (O5)	53.94	10.39	57.74	9.71	54.22	10.38
Values (O6)	46.48	10.17	52.62	10.55	46.91	10.32
Agreeableness (A)	44.18	10.57	43.14	10.41	44.12	10.56
Trust (A1)	49.50	10.47	50.26	11.41	49.57	10.55
Straightforwardness (A2)	47.91	10.32	47.44	9.96	47.88	10.31
Altruism (A3)	52.72	9.80	51.62	10.67	52.63	9.86
Compliance (A4)	45.51	11.28	44.10	10.55	45.41	11.23
Modesty (A5)	47.42	10.62	46.83	11.58	47.38	10.69
Tender-Mindedness (A6)	46.64	9.93	44.92	10.74	46.50	9.99
Conscientiousness (C)	54.93	10.15	54.34	10.65	54.88	10.19
Competence (C1)	55.85	9.17	55.76	9.53	55.84	9.20
Order (C2)	50.67	10.31	50.68	10.86	50.68	10.34
Dutifulness (C3)	52.97	9.09	51.38	9.86	52.86	9.16
Achievement Striving (C4)	59.22	9.21	59.56	9.75	59.22	9.25
Self-Discipline (C5)	52.64	9.56	52.51	9.77	52.63	9.57
Deliberation (C6)	50.67	10.27	50.74	9.68	50.68	10.22

Note: Male N=11,725; Female N=900; Combined sample N=12,702.

Table 8. Percentiles for NEO PI-R Domain Scales

Raw Score	Men					Women					Combined				
	N	E	O	A	C	N	E	O	A	C	N	E	O	A	C
22	1										1				
24	1					1					1				
26	1					1					1				
28	1					1					1				
30	2					1					2				
32	2					2					2				
34	3					2					3				
36	4					2					4				
38	5					3					5				
40	6					4					6				
42	8					5					8				
44	10					6					9				
46	11					8					11				
48	14					10					13				
50	16					13					16				
52	20					15					19				
54	23					17					22				
56	27					20					26				
58	31					23					30				
60	35					25					35				
62	40					29					39				
64	44		1	1		33					44		1	1	
66	49		1	1		39					48		1	1	
68	54		1	1		42					53		1	1	
70	58		1	1		46					57		1	1	
72	62		1	1		50					61		1	1	
74	66		2	2		53				1	65		2	2	
76	70		2	2		57		1		1	69		2	2	
78	73		3	2		60		1	1	1	72		3	2	
80	76	1	3	3	1	63		1	2	1	75	1	3	3	1
82	80	1	4	4	1	67		1	2	1	79	1	4	4	1
84	82	1	5	4	1	71		1	2	1	81	1	5	4	1
86	84	1	7	5	1	74		2	3	2	84	1	7	5	1
88	87	2	8	6	1	77		2	3	2	86	2	8	6	1
90	89	2	11	8	2	80	1	3	4	3	88	2	10	7	2
92	91	3	13	9	2	83	1	3	4	4	90	2	12	9	2
94	92	3	15	11	3	84	1	4	5	4	92	3	14	10	3
96	94	4	18	13	3	86	2	6	7	5	93	4	17	12	3
98	95	5	21	15	4	87	3	7	7	6	94	5	20	15	4
100	96	6	24	18	4	90	4	8	10	6	95	6	23	17	5
102	96	8	28	21	6	91	5	10	12	8	96	7	26	21	6
104	97	9	32	25	7	92	7	12	14	9	97	9	30	24	7
106	98	11	36	28	8	93	9	15	16	11	97	11	34	27	8
108	98	13	41	32	10	94	9	18	19	13	98	13	39	31	10
110	98	15	45	37	11	95	11	22	22	15	98	15	44	36	11
112	99	18	50	42	13	96	13	25	27	17	99	18	48	41	14
114	99	21	54	47	16	97	15	29	31	20	99	20	52	46	16
116	99	24	59	52	19	97	17	33	36	22	99	24	57	51	19
118	99	28	63	57	22	97	20	36	42	25	99	27	61	56	22

Table 8. Percentiles for NEO PI-R Domain Scales (concluded)

Raw Score	Men					Women					Combined				
	N	E	O	A	C	N	E	O	A	C	N	E	O	A	C
120		32	67	63	25	98	22	41	46	28	99	31	65	61	26
122		36	71	68	29	98	25	47	52	31		36	69	67	29
124		41	75	73	33	99	30	52	58	35		40	73	72	33
126		46	78	77	37	99	33	57	63	39		45	77	76	37
128		51	81	81	42	99	38	63	67	43		50	80	80	42
130		56	84	84	47	99	43	68	73	48		55	83	84	47
132		61	86	87	52	99	47	71	76	53		60	85	86	52
134		66	89	90	57		53	74	79	59		65	88	89	57
136		70	91	92	62		58	78	84	62		70	90	91	62
138		74	92	94	66		63	82	88	66		74	91	93	66
140		78	93	95	70		67	85	90	72		77	93	95	70
142		81	95	96	74		72	87	92	75		81	94	96	74
144		84	96	97	78		77	90	94	79		84	95	97	78
146		87	96	98	81		80	91	94	82		86	96	98	81
148		89	97	98	84		83	93	96	85		89	97	98	84
150		91	98	99	87		86	95	97	88		91	98	99	87
152		93	98	99	89		88	96	97	90		93	98	99	89
154		94	99	99	91		90	96	98	92		94	99	99	91
156		95	99		93		92	97	99	94		95	99		93
158		96	99		94		93	97		94		96	99		94
160		97	99		95		95	98		95		97	99		95
162		98			96		96	99		97		98			96
164		99			97		97	99		98		99			97
166		99			98		98	99		99		99			98
168		99			99		99			99		99			99
170					99		99			99					99
172							99								

Note: Male N=11,725; Female N=900; Combined sample N=12,702.

Table 9. Percentiles for *Neuroticism* Facet Scales

Raw Score	Men						Women						Combined					
	N1	N2	N3	N4	N5	N6	N1	N2	N3	N4	N5	N6	N1	N2	N3	N4	N5	N6
0						2						1						2
1	1		1			6		1	2			3	1		1			6
2	1	1	3	1		12		1	3			5	1	1	3	1		11
3	2	2	5	1		18	1	2	5	1		10	2	2	5	1		18
4	4	4	9	2	1	26	2	3	8	2	1	15	4	4	9	2	1	25
5	6	6	14	4	1	35	3	6	12	3	1	21	6	6	14	4	1	34
6	10	10	20	6	2	47	4	9	17	5	2	32	9	10	20	6	2	46
7	14	15	28	10	5	59	8	15	24	9	4	45	14	15	28	10	4	58
8	21	23	38	16	8	73	13	23	34	14	7	58	21	23	38	16	8	71
9	28	32	48	24	12	82	18	31	43	20	10	67	28	32	48	24	12	81
10	37	42	59	33	18	89	25	42	53	30	14	78	36	42	59	33	18	89
11	45	51	68	43	25	94	32	52	59	38	19	86	44	51	67	42	25	93
12	54	61	76	52	33	96	39	61	68	47	25	91	53	61	75	52	32	96
13	62	68	82	61	41	98	47	68	74	54	33	94	61	68	81	61	40	98
14	70	75	86	69	50	99	54	74	79	61	41	97	69	75	86	69	49	99
15	76	81	90	76	58	99	62	80	84	68	48	98	75	81	89	76	57	99
16	82	86	92	82	66		70	85	87	76	57	98	81	96	92	82	65	
17	87	89	94	87	73		75	88	89	82	63	99	86	98	94	87	72	
18	92	92	96	91	80		81	92	92	86	70		91	92	96	91	79	
19	94	95	97	94	85		86	93	94	89	77		94	94	97	93	85	
20	97	96	98	96	90		89	95	95	93	83		96	96	98	96	90	
21	98	97	99	98	93		94	96	96	94	88		98	97	99	97	93	
22	99	98	99	99	96		97	97	97	96	92		99	98	99	98	96	
23	99	99		99	98		98	98	98	97	94		99	99		99	97	
24		99			99		99	99	99	99	97			99		99	99	
25					99		99	99		99	98						99	
26							99				99							
27											99							
28											99							

Note: Male N=11,725; Female N=900; Combined sample N=12,702.

Table 10. Percentiles for *Extraversion* Facet Scales

Raw Score	Men						Women						Combined					
	E1	E2	E3	E4	E5	E6	E1	E2	E3	E4	E5	E6	E1	E2	E3	E4	E5	E6
4		1												1				
5		1						1						1				
6		1						1						1				
7		2						2						2				
8		3	1			1		2						3	1			
9		5	1			1		4	1					4	1			1
10	1	6	2	1		1		5	2					6	2	1		1
11	1	8	3	1		2		7	3				1	1	8	3	1	2
12	1	11	4	2		3	1	9	5	1			1	1	11	4	2	3
13	2	14	6	3	1	4	1	13	7	2	1		1	2	14	7	3	4
14	3	18	10	5	2	6	2	16	10	3	3	3	3	18	10	5	2	6
15	4	22	14	8	2	9	3	20	15	5	4	4	4	22	14	7	3	9
16	6	28	19	12	4	13	4	26	21	7	7	5	6	28	20	12	4	12
17	8	34	26	19	6	18	6	32	28	11	11	8	8	34	26	18	7	17
18	12	42	34	27	10	23	8	38	35	16	15	11	11	41	34	26	10	23
19	16	50	42	36	15	30	11	46	42	23	20	14	16	50	42	35	15	29
20	22	59	52	48	22	39	14	54	51	34	27	18	21	59	52	47	23	37
21	29	68	61	59	31	48	19	60	60	45	35	24	29	67	61	58	31	46
22	39	76	70	69	41	58	25	69	70	58	44	32	38	76	70	69	41	56
23	51	83	78	78	52	67	35	76	78	69	56	42	50	82	78	78	52	66
24	64	88	84	85	63	76	49	83	85	79	67	55	63	88	84	85	64	75
25	74	92	89	91	73	83	59	87	90	86	76	64	73	92	89	90	74	82
26	83	95	92	94	82	89	70	91	95	92	84	71	82	95	93	94	82	87
27	88	97	95	97	88	92	78	94	96	95	90	80	88	97	95	97	88	92
28	92	98	97	98	93	95	84	97	98	97	95	87	92	98	97	98	93	95
29	96	99	99	99	96	97	91	98	99	98	97	90	95	99	99	99	96	97
30	98	99	99		99	99	95	99			99	95	98	99	99		99	98
31	99						99					98	99					99

Note: Male N=11,725; Female N=900; Combined sample N=12,702.

Table 11. Percentiles for *Openness to Experience* Facet Scales

Raw Score	Men						Women						Combined					
	01	02	03	04	05	06	01	02	03	04	05	06	01	02	03	04	05	06
2		1												1				
3		1												1				
4		2						1						2				
5		3						1						3				
6	1	4		1		1		1					1	4		1		1
7	1	6		1	1	1	1	2					1	6		1	1	1
8	2	9	1	2	1	2	2	3		1	1		2	9		2	1	2
9	4	13	1	3	1	3	3	3		1	1	1	4	12	1	3	1	3
10	6	17	1	6	2	4	5	6		2	1	1	6	16	1	5	2	4
11	9	21	2	9	3	6	8	8		4	2	2	9	20	2	9	3	5
12	13	27	3	14	5	8	10	11	1	7	4	3	13	26	3	14	5	8
13	18	33	5	20	6	11	14	15	2	10	5	4	17	32	5	20	6	10
14	23	39	8	29	9	14	18	19	2	14	7	5	23	38	7	28	8	14
15	30	46	11	37	11	19	24	23	4	19	9	7	29	44	11	36	11	18
16	37	53	16	47	15	25	30	28	4	28	12	10	37	51	15	46	15	24
17	45	59	22	57	20	32	37	33	8	38	16	15	44	57	21	56	19	31
18	53	65	29	66	25	40	45	40	14	48	22	19	52	64	28	65	25	38
19	60	71	38	75	30	49	52	47	19	59	29	25	59	70	36	74	30	47
20	67	77	47	82	37	59	59	53	26	70	36	35	66	75	45	82	37	58
21	73	82	56	88	43	69	66	60	34	77	43	46	73	80	55	88	43	67
22	80	86	66	93	51	78	73	69	47	85	53	59	79	85	64	92	52	76
23	85	90	75	96	60	85	79	76	58	91	61	69	85	89	74	95	60	83
24	90	93	83	98	69	90	86	82	68	95	71	78	89	92	82	98	69	89
25	93	95	88	99	75	94	91	86	77	97	77	86	93	94	88	99	75	93
26	95	97	92		81	96	94	91	83	99	83	91	95	96	92	99	81	96
27	97	98	95		85	98	96	94	89		88	95	97	98	95		85	98
28	98	99	97		89	99	98	96	92		91	97	98	99	97		89	99
29	99	99	99		93		99	98	96		94	98	99	99	98		93	99
30			99		95		99	99	98		96	99			99		95	
31					98			99			98						98	

Note: Male N=11,725; Female N=900; Combined sample N=12,702.

Table 12. Percentiles for *Agreeableness* Facet Scales

Raw Score	Men						Women						Combined					
	A1	A2	A3	A4	A5	A6	A1	A2	A3	A4	A5	A6	A1	A2	A3	A4	A5	A6
4					1					1							1	
5				1	1		1			1						1	1	
6	1			1	2		1			2	1		1			1	2	
7	1	1		2	3	1	1	1		3	1		1	1		2	3	1
8	1	1		4	4	1	2	1		4	2		1	1		4	4	1
9	2	2		6	6	2	2	1		5	2	1	2	2		6	6	2
10	3	3		9	9	2	3	1		7	5	1	3	3		9	9	2
11	5	5		13	13	4	4	2		10	7	1	4	5		13	12	4
12	6	8		19	18	6	5	3		16	9	3	6	7		19	17	6
13	8	11	1	25	23	9	6	5		23	13	4	8	11	1	25	22	8
14	10	16	1	33	30	13	8	9		29	19	8	10	15	1	33	29	13
15	13	21	2	42	38	19	9	13	1	38	25	13	13	20	2	41	37	19
16	17	27	3	51	46	27	13	17	2	48	35	19	17	27	3	51	45	26
17	22	34	4	61	54	37	17	22	3	56	42	28	22	34	4	61	54	36
18	29	42	7	70	63	47	21	29	4	66	51	38	28	41	7	70	62	47
19	36	51	11	78	71	59	27	36	6	74	60	51	35	50	11	78	70	58
20	44	60	17	86	78	70	34	45	10	81	69	64	43	59	17	85	77	70
21	53	70	25	91	84	79	41	56	15	87	75	75	52	69	24	91	84	79
22	64	78	34	95	90	87	52	65	24	92	82	84	63	77	34	94	89	87
23	75	85	45	97	93	92	64	74	33	95	99	90	74	84	45	97	93	92
24	88	90	59	98	95	96	78	82	48	97	93	95	87	90	58	98	95	96
25	93	94	70	99	97	98	85	88	59	99	95	98	92	93	69	99	97	98
26	95	96	79		98	99	91	92	69	99	97	99	95	96	78		98	99
27	97	98	86		99	99	94	95	79		98	99	97	97	86		99	99
28	98	99	91				96	97	86		99		98	99	91			
29	99	99	95				98	98	92				99	99	95			
30	99		98				99	99	96				99		98			
31			99				99		98						99			

Note: Male N=11,725; Female N=900; Combined sample N=12,702.

Table 13. Percentiles for *Conscientiousness* Facet Scales

Raw Score	Men						Women						Combined					
	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6
6		1				1		1				1		1				1
7		1				1		1				1		1				1
8		1				2		2			1	2		1				2
9		2				3		3			1	3		2				3
10		3			1	4		4			2	5		3			1	5
11		5		1	1	7		6		1	2	8		5		1	1	7
12		7		1	2	10		9		1	3	12		7		1	2	10
13		10		2	3	15		11	1	1	4	16		10		2	3	15
14		14	1	2	4	21	1	15	1	2	6	22		14	1	2	4	21
15	1	18	1	3	5	27	2	20	2	4	8	31	1	18	1	3	6	28
16	1	25	2	5	8	36	2	26	4	5	10	39	2	25	2	5	8	36
17	2	33	4	8	11	45	4	31	6	8	13	48	3	33	4	8	11	45
18	4	42	6	11	15	55	6	41	10	11	17	58	4	42	6	11	15	55
19	6	52	9	16	20	64	10	50	15	16	22	66	7	52	10	16	20	64
20	11	63	14	24	26	73	16	59	22	22	28	77	11	62	15	24	27	73
21	16	72	21	32	34	81	23	66	28	30	34	83	17	71	22	32	34	81
22	25	80	31	43	43	87	34	75	36	40	43	89	26	80	31	43	43	87
23	37	86	41	53	54	92	45	82	47	50	53	93	38	86	42	53	54	92
24	51	91	54	63	67	95	57	88	59	58	67	97	52	90	54	62	68	95
25	64	94	64	72	77	97	70	92	69	67	77	98	64	94	65	72	77	97
26	74	96	74	80	84	98	81	96	79	77	84	98	74	96	74	80	84	98
27	82	98	82	88	89	99	87	97	86	86	90	99	83	98	82	88	89	99
28	88	99	88	93	93		92	99	92	92	94		89	99	88	93	93	
29	93		93	97	96		96		95	97	96		94		93	97	96	
30	97		97	99	98		98		98	99	98		97		97	99	98	
31	99		99		99		99		99		99		99		99		99	

Note: Male N=11,725; Female N=900; Combined sample N=12,702.

5.0 THE PERSONALITY ASSESSMENT INVENTORY

The PAI has 22 scales comprising 344 items measuring personality and psychopathology. Respondents are directed to respond “false,” “somewhat true,” “mainly true,” or “very true.” Unlike the tests already considered, the PAI has validity scales to gauge the test-taking attitude and possibly the degree to which the respondent attempted to engage in impression management.

5.1 Method

5.1.1 Participants. A sample of 1,309 pilot training candidates was administered the PAI prior to the 53 wk of SUPT. All were college graduates or were near completion of college. Many had private pilot’s licenses or had completed part of training for a private pilot’s license including flight hours in a light aircraft. Of those reporting demographic information, 94.3% were men. All participants were under the age of 40, with a mean age of 24 yr, SD of 2.9 yr, and modal age of 22 yr. Ethnic and racial distributions were unavailable for the majority of the participants. All participants were tested at the School of Aerospace Medicine at Brooks City-Base, TX, or at the USAF Academy in Colorado Springs, CO.

5.1.2 Measure. The PAI, developed in 1991, was designed to provide information on critical clinical personality variables to aid clinicians in the diagnosis of patients, screening for psychopathology, and treatment planning (Ref 10). Ten of the full scales contain conceptually derived subscales designed to facilitate interpretation and coverage of the full breadth of complex clinical constructs. As noted above, items are in the form of statements that require subjects to respond on a Likert-type scale, ranging from 1 (“false”) to 4 (“very true”). The PAI is a measure of fitness – to determine whether or not the test taker has a disqualifying mental illness.

Table 14 provides a description of the scales and subscales as well as their reliabilities in a census-matched sample of 1,000 individuals.

Table 14. Scale/Subscale Definitions and Reliabilities of the PAI

Scale/Subscale	Definition	Reliability
Inconsistency (ICN)	Measures the consistency with which an individual answered items with similar content.	.45
Infrequency (INF)	Identifies individuals who randomly respond to the PAI.	.52
Negative Impression (NIM)	Identifies individuals who are trying to present an exaggerated negative impression with unlikely and bizarre symptoms.	.72
Positive Impression (PIM)	Identifies individuals who are trying to present a favorable impression or deny minor faults.	.71
Somatic Complaints (SOM)	Measures concerns about physical functioning and health, minor to severe.	.89
Conversion (SOM-C)	Measures functional impairment associated with sensory or motor problems.	.74
Somatization (SOM-S)	Measures the occurrence of physical symptoms and vague complaints of poor health and fatigue.	.68
Health Concerns (SOM-H)	Measures the preoccupation individuals have with their health and other physical problems.	.81
Anxiety (ANX)	Measures anxiety ranging from feelings of apprehension to physical signs of stress and tension.	.90
Cognitive (ANX-C)	Identifies individuals who report prominent concern and worry to the degree that their ability to concentrate is compromised.	.81
Affective (ANX-A)	Identifies individuals who report a great deal of tension, trouble relaxing, and exhaustion related to high stress.	.73
Physiological (ANX-P)	Identifies individuals who show physical signs of tension and stress like irregular heartbeat and sweaty palms.	.74

Table 14. Scale/Subscale Definitions and Reliabilities of the PAI (continued)

Scale/Subscale	Definition	Reliability
Anxiety-Related Disorder (ARD)	Measures the prevalence of anxiety-related disorders such as fears, phobias, and obsessive-compulsive thoughts and behaviors.	.76
Obsessive-Compulsive (ARD-O)	Identifies individuals who show excessive attention to detail, often inhibiting decision making, and who show signs of stress brought on by changes in routine.	.56
Phobias (ARD-P)	Identifies individuals who have such a fear of an object or situation that it significantly interferes with their life.	.58
Traumatic Stress (ARD-T)	Identifies individuals who have experienced a traumatic event that continues to distress them.	.81
Depression (DEP)	Measures symptoms of depression such as negativity, unhappiness, low energy, and changes in sleep.	.87
Cognitive (DEP-C)	Measures reports of trouble concentrating, indecisiveness, and feelings of failure and hopelessness.	.74
Affective (DEP-A)	Measures reports of sadness, losses in interest, and losses of enjoyment for former activities.	.80
Physiological (DEP-P)	Measures depression in a somatic form such as losses in sleep and appetite and less energy.	.71
Mania (MAN)	Measures elements of mania and hypomania such as elevated mood, grandiosity, and impatience.	.82
Activity Level (MAN-A)	Identifies individuals who have a higher than average energy level.	.51
Grandiosity (MAN-G)	Identifies individuals who have elevated levels of self-esteem or grandiosity.	.73
Irritability (MAN-I)	Identifies individuals who report that their relationships are strained due to others' inability to keep up with their demands.	.78
Paranoia (PAR)	Measures the paranoia of an individual with respect to both personality elements and symptomatology.	.85
Hypervigilance (PAR-H)	Identifies individuals who closely monitor their environment because they feel that others are trying to harm them.	.64
Persecution (PAR-P)	Identifies individuals who feel that they are being treated unfairly and believe that others are trying to undermine their interests.	.76
Resentment (PAR-R)	Identifies individuals who are easily insulted and typically respond by holding grudges.	.66

**Table 14. Scale/Subscale Definitions and Reliabilities
of the PAI (continued)**

Scale/Subscale	Definition	Reliability
Schizophrenia (SCZ)	Measures unusual beliefs and perceptions, poor social competence, and disturbances in attention.	.81
Psychotic Experiences (SCZ-P)	Identifies individuals who experience unusual sensations, magical thinking, and other delusions.	.56
Social Detachment (SCZ-S)	Identifies individuals who are socially isolated and have few close relationships.	.79
Thought Disorder (SCZ-T)	Identifies individuals who are often confused and have difficulty concentrating.	.73
Borderline Features (BOR)	Measures many elements relating to severe personality disorders.	.87
Affective Instability (BOR-A)	Identifies individuals who experience extreme mood swings and have trouble controlling their anger.	.71
Identity Problems (BOR-I)	Identifies individuals who are uncertain about major life issues and feel bored or unfulfilled.	.70
Negative Relationships (BOR-N)	Identifies individuals who report a history of involvement in unstable relationships.	.63
Self-Harm (BOR-S)	Identifies individuals who are impulsive in areas with potentially negative consequences such as substance abuse, sex, and spending.	.62
Antisocial Features (ANT)	Measures behaviors related to an antisocial personality and psychopathy.	.84
Antisocial Behaviors (ANT-A)	Identifies individuals who have a history of antisocial acts and may be involved in criminal acts.	.73
Egocentricity (ANT-E)	Identifies individuals who have little regard for others and may take advantage of people without feeling much remorse.	.63
Stimulus-Seeking (ANT-S)	Identifies individuals who demonstrate reckless behavior that is dangerous to themselves and others around them.	.69
Alcohol Problems (ALC)	Measures behaviors and consequences related to alcohol use, abuse, and dependence.	.84
Drug Problems (DRG)	Measures behaviors and consequences related to drug use, abuse, and dependence.	.74

Table 14. Scale/Subscale Definitions and Reliabilities of the PAI (concluded)

Scale/Subscale	Definition	Reliability
Aggression (AGG)	Measures behaviors relevant to anger, hostility, and aggression.	.85
Aggressive Attitude (AGG-A)	Identifies individuals who are easily angered and have trouble controlling their anger.	.74
Verbal Aggression (AGG-V)	Identifies individuals who are not intimidated by confrontation and tend to be verbally aggressive.	.67
Physical Aggression (AGG-P)	Identifies individuals who are prone to displays of anger, fights, and threats of violence.	.71
Suicidal Ideation (SUI)	Measures ideas and thoughts related to death and suicide.	.85
Stress (STR)	Measures the amount of life stressors that an individual is experiencing including relationships, finances, or major life changes.	.76
Nonsupport (NON)	Measures an individual's perceived lack of social support relating to the presence and quality of their social relationships.	.72
Treatment Rejection (RXR)	Measures attitudes associated with an interest in personal changes of a psychological nature such as willingness to participate in treatment.	.76
Dominance (DOM)	Measures the extent to which an individual is controlling, submissive, or autonomous in relationships.	.78
Warmth (WRM)	Measures the extent to which an individual is empathic or mistrustful in relationships.	.79

Note: Reliability estimated through internal consistency using coefficient alpha for a census-matched sample of 1,000 individuals (Ref 10).

5.1.3 Procedure. Descriptive data (means and SDs) were computed for the scales and subscales of the PAI for the three groups: men, women, and the combined sample. Percentile tables were then created to show the percentile corresponding to a particular raw score on a PAI scale or subscale. This information is displayed for men, women, and the combined sample. Finally, profile sheets were created to show the T-score corresponding to a particular raw score on the PAI scales and subscales for the pilot sample. These profile sheets help clinicians chart an individual's scores and allow for better interpretation, since comparisons can be made from this aviator to a pool of aviators. The profile sheets for this test can be found in Appendix C.

5.2 Results

Table 15 displays the descriptive statistics for the scales and subscales of the PAI for the male sample, female sample, and combined sample. The five scales are in bold text and the subscales are in regular text.

Table 15. PAI Scale and Subscale T-Score Means and Standard Deviations

Scale/Subscale	Men		Women		Combined	
	Mean	SD	Mean	SD	Mean	SD
Inconsistency (ICN)	42.87	6.65	41.08	6.11	42.77	6.63
Infrequency (INF)	49.56	7.38	50.45	8.25	49.61	7.43
Negative Impression (NIM)	45.12	3.21	45.19	2.92	45.13	3.19
Positive Impression (PIM)	58.63	8.76	56.77	9.61	58.52	8.82
Somatic Complaints (SOM)	41.88	2.56	42.27	2.24	41.90	2.54
Conversion (SOM-C)	43.55	1.73	43.44	1.28	43.55	1.71
Somatization (SOM-S)	40.72	3.42	41.53	3.78	40.77	3.44
Health Concerns (SOM-H)	44.22	3.68	44.52	3.66	44.23	3.68
Anxiety (ANX)	41.53	5.01	43.59	6.40	41.64	5.12
Cognitive (ANX-C)	43.56	5.91	46.31	7.82	43.72	6.07
Affective (ANX-A)	40.32	5.55	42.33	6.16	40.44	5.60
Physiological (ANX-P)	43.40	4.56	43.81	4.92	43.43	4.58
Anxiety-Related Disorder (ARD)	41.78	6.11	44.09	7.41	41.92	6.23
Obsessive-Compulsive (ARD-O)	49.88	8.91	51.39	10.59	49.96	9.02
Phobias (ARD-P)	38.69	5.92	41.33	6.52	38.84	5.99
Traumatic Stress (ARD-T)	43.63	4.57	44.48	5.21	43.68	4.61
Depression (DEP)	40.47	4.67	41.40	6.27	40.52	4.78
Cognitive (DEP-C)	41.33	4.79	42.35	6.22	41.39	4.88
Affective (DEP-A)	43.61	4.82	43.73	6.22	43.62	4.91
Physiological (DEP-P)	41.12	5.35	42.24	5.83	41.19	5.38
Mania (MAN)	54.83	9.41	53.31	10.09	54.74	9.45
Activity Level (MAN-A)	49.85	9.83	51.69	9.95	49.95	9.84
Grandiosity (MAN-G)	61.62	9.88	56.75	10.74	61.34	9.99
Irritability (MAN-I)	48.82	9.54	49.07	10.49	48.83	9.59
Paranoia (PAR)	46.35	7.49	46.47	7.98	46.35	7.52
Hypervigilance (PAR-H)	48.79	9.03	49.36	9.84	48.82	9.07
Persecution (PAR-P)	46.51	6.82	46.52	7.05	46.51	6.83
Resentment (PAR-R)	45.28	7.94	45.07	8.15	45.26	7.95
Schizophrenia (SCZ)	41.94	6.51	42.00	6.22	41.95	6.49
Psychotic Experiences (SCZ-P)	44.74	7.40	44.36	6.65	44.72	7.36
Social Detachment (SCZ-S)	44.06	6.92	44.16	6.86	44.07	6.91
Thought Disorder (SCZ-T)	42.84	5.93	43.24	5.58	42.87	5.91
Borderline Features (BOR)	42.73	6.56	44.28	7.14	42.82	6.60
Affective Instability (BOR-A)	43.06	6.28	44.24	7.48	43.13	6.36
Identity Problems (BOR-I)	43.85	6.09	45.51	6.61	43.95	6.13
Negative Relationships (BOR-N)	44.89	7.81	47.73	7.91	45.06	7.84
Self-Harm (BOR-S)	44.89	7.17	43.61	6.84	44.82	7.16
Antisocial Features (ANT)	51.89	8.60	49.80	7.52	51.77	8.55
Antisocial Behaviors (ANT-A)	47.60	7.91	43.27	4.50	47.35	7.82
Egocentricity (ANT-E)	49.71	8.03	48.76	7.38	49.65	8.00
Stimulus-Seeking (ANT-S)	57.89	10.76	58.77	12.43	57.94	10.86
Alcohol Problems (ALC)	46.92	5.28	45.52	4.88	46.84	5.27
Drug Problems (DRG)	44.97	4.56	44.67	3.98	44.95	4.53
Aggression (AGG)	45.89	7.33	46.09	8.43	45.91	7.40
Aggressive Attitude (AGG-A)	42.65	7.61	44.51	9.38	42.75	7.73
Verbal Aggression (AGG-V)	51.04	8.78	50.49	10.10	51.01	8.86
Physical Aggression (AGG-P)	45.93	5.94	44.77	4.85	45.86	5.89
Suicidal Ideation (SUI)	44.45	3.01	44.56	3.37	44.46	3.03
Stress (STR)	42.92	5.08	43.44	5.59	42.95	5.11
Nonsupport (NON)	43.74	7.01	44.53	7.89	43.79	7.06
Treatment Rejection (RXR)	61.00	6.76	58.88	7.68	60.88	6.83
Dominance (DOM)	58.61	7.31	57.47	9.98	58.54	7.49
Warmth (WRM)	55.05	8.77	53.73	10.53	54.97	8.88

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 16 displays the percentile corresponding to a particular raw score on the validity scales of the PAI: *Inconsistency*, *Infrequency*, *Negative Impression*, and *Positive Impression*. For each scale, percentiles are presented for the male, female, and combined sample.

Table 17 displays the percentile corresponding to a particular raw score on the Somatic Complaints scale and subscales of the PAI: *Conversion*, *Somatization*, and *Health Concerns*. For the scale and subscales, percentiles are presented for the male, female, and combined sample.

Table 18 displays the percentile corresponding to a particular raw score on the Anxiety scale and subscales of the PAI: *Cognitive*, *Affective*, and *Physiological*. For the scale and subscales, percentiles are presented for the male, female, and combined sample.

Table 19 displays the percentile corresponding to a particular raw score on the Anxiety-Related Disorders scale and subscales of the PAI: *Obsessive-Compulsive*, *Phobias*, and *Traumatic Stress*. For the scale and subscales, percentiles are presented for the male, female, and combined sample.

Table 20 displays the percentile corresponding to a particular raw score on the Depression scale and subscales of the PAI: *Cognitive*, *Affective*, and *Physiological*. For the scale and subscales, percentiles are presented for the male, female, and combined sample.

Table 21 displays the percentile corresponding to a particular raw score on the Mania scale and subscales of the PAI: *Activity Level*, *Grandiosity*, and *Irritability*. For the scale and subscales, percentiles are presented for the male, female, and combined sample.

Table 25 displays the percentile corresponding to a particular raw score on the Antisocial Features scale and subscales of the PAI: *Antisocial Behaviors*, *Egocentricity*, and *Stimulus-Seeking*. For the scale and subscales, percentiles are presented for the male, female, and combined sample.

Table 26 displays the percentile corresponding to a particular raw score on the Alcohol Problems and Drug Problems scales of the PAI. There are no subscales for these scales. Percentiles are presented for the male, female, and combined sample.

Table 27 displays the percentile corresponding to a particular raw score on the Aggression scale and subscales of the PAI: *Aggressive Attitude*, *Verbal Aggression*, and *Physical Aggression*. For the scale and subscales, percentiles are presented for the male, female, and combined sample.

Table 28 displays the percentile corresponding to a particular raw score on the Suicide Ideation, Stress, and Nonsupport scales of the PAI. There are no subscales for these scales. Percentiles are presented for the male, female, and combined sample.

Table 29 displays the percentile corresponding to a particular raw score on the Treatment Rejection, Dominance, and Warmth scales of the PAI. There are no subscales for these scales. Percentiles are presented for the male, female, and combined sample.

Table 16. Percentiles for Validity Scales of the PAI

Raw Score	Men				Women				Combined			
	ICN	INF	NIM	PIM	ICN	INF	NIM	PIM	ICN	INF	NIM	PIM
0	11	15	81		16	17	80	1	11	15	81	
1	29	35	93		41	31	91		29	35	93	
2	47	53	97		61	49	96		48	53	97	
3	66	71	98		76	69	99		67	71	98	
4	80	83	99		85	77			80	83	99	
5	88	92	99		93	85			88	91		
6	93	97			96	93			93	97		
7	96	99		1	97	99			96	99		1
8	98			1	99				98			1
9	99			2				3	99			2
10	99			3				5	99			3
11				4				6				4
12				6				7				6
13				9				12				9
14				13				16				13
15				19				21				19
16				26				32				26
17				34				40				34
18				42				48				42
19				53				60				53
20				63				73				64
21				73				84				74
22				84				88				84
23				91				95				91
24				95				96				95
25				98				99				98

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 17. Percentiles for the Somatic Complaints Scale and Subscales of the PAI

Raw Score	Men				Women				Combined			
	SOM	SOM-C	SOM-S	SOM-H	SOM	SOM-C	SOM-S	SOM-H	SOM	SOM-C	SOM-S	SOM-H
0	17	88	50	27	12	88	41	25	17	88	49	27
1	35	96	73	53	27	97	63	49	34	96	72	52
2	50	99	84	72	37		76	65	50	99	84	71
3	68	99	95	89	57		91	85	68		95	89
4	78		99	96	72		99	95	78		99	96
5	86			98	83			99	86			98
6	92			99	89				92			99
7	95			99	97				95			
8	97				99				97			
9	98								98			
10	99								99			
11	99								99			
12	99								99			
13	99											

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 18. Percentiles for the Anxiety Scale and Subscales of the PAI

Raw Score	Men				Women				Combined			
	ANX	ANX-C	ANX-A	ANX-P	ANX	ANX-C	ANX-A	ANX-P	ANX	ANX-C	ANX-A	ANX-P
0	3	10	19	21	4	8	9	24	3	10	19	21
1	9	26	39	49	8	16	28	41	9	25	38	49
2	14	46	55	73	9	25	44	68	14	45	54	73
3	22	63	71	86	13	49	56	85	22	62	70	86
4	31	75	83	94	20	64	71	93	30	74	83	94
5	40	84	92	97	27	71	79	95	40	84	91	97
6	48	90	96	99	39	81	91	97	48	90	95	99
7	57	93	98		47	84	96		56	92	98	
8	64	95	99		53	87	97		63	95	99	
9	70	97	99		56	95	99		69	97	99	
10	76	98			63	96			75	98		
11	81	99			65	96			80	99		
12	85				73	96			84	99		
13	89				77	97			88			
14	91				80	97			91			
15	93				81	99			92			
16	94				83				93			
17	96				91				96			
18	97				92				97			
19	98				93				97			
20	98				95				98			
21	99				96				98			
22	99				97				99			
23	99				97				99			
24	99				98				99			
25	99				98				99			
26					98							
27					98							
28					99							

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 19. Percentiles for the Anxiety-Related Disorders Scale and Subscales of the PAI

Raw Score	Men				Women				Combined			
	ARD	ARD-O	ARD-P	ARD-T	ARD	ARD-O	ARD-P	ARD-T	ARD	ARD-O	ARD-P	ARD-T
0			15	53	1	1	5	40			15	52
1			35	73	2	3	23	64			34	72
2		1	54	85	2	4	41	76	1	1	54	84
3	1	3	70	91	2	5	51	89	1	3	69	91
4	2	7	82	94	3	7	67	95	2	7	81	94
5	4	13	90	96	4	12	77	96	4	13	90	96
6	7	21	96	97	5	20	87	97	6	21	96	97
7	11	30	98	98	7	29	96	99	11	30	98	98
8	16	41	99	99	11	40	99		16	41	99	99
9	23	54	99	99	16	48			23	53	99	99
10	32	65		99	23	59			32	64		99
11	41	75			29	68			40	75		
12	50	83			39	75			50	82		
13	59	89			51	79			59	88		
14	66	93			59	84			66	92		
15	72	96			61	87			71	95		
16	78	98			65	96			77	98		
17	82	99			67	99			81	99		
18	85				68				84			
19	88				71				87			
20	92				76				91			
21	95				84				94			
22	96				89				95			
23	97				92				96			
24	97				93				97			
25	98				96				98			
26	98				97				98			
27	99				97				99			
28	99				98				99			
29	99				99				99			
30	99								99			

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 20. Percentiles for the Depression Scale and Subscales of the PAI

Raw Score	Men				Women				Combined			
	DEP	DEP-C	DEP-A	DEP-P	DEP	DEP-C	DEP-A	DEP-P	DEP	DEP-C	DEP-A	DEP-P
0	10	39	32	26	8	35	29	17	10	37	32	26
1	20	60	54	48	19	57	60	40	20	60	54	47
2	29	75	73	62	32	72	81	57	29	75	73	62
3	39	90	85	78	39	80	88	68	39	89	85	78
4	51	96	93	87	45	91	92	79	50	96	93	87
5	60	98	97	92	57	96	93	89	59	98	97	92
6	67	99	98	95	63	97	96	93	67	99	98	95
7	75		99	97	72	98	97	96	75		99	97
8	81		99	98	77	99	97	99	80		99	98
9	85			99	81		98		85			99
10	88			99	83		99		88			99
11	91				85				91			
12	94				89				93			
13	95				91				95			
14	96				91				96			
15	97				92				97			
16	98				95				98			
17	98				96				98			
18	99				96				99			
19	99				96				99			
20	99				97				99			
21	99				97				99			
22	99				97				99			
23					97				99			
24					97				99			
25					97							
26					99							

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 21. Percentiles for the Mania Scale and Subscales of the PAI

Raw Score	Men				Women				Combined			
	MAN	MAN-A	MAN-G	MAN-I	MAN	MAN-A	MAN-G	MAN-I	MAN	MAN-A	MAN-G	MAN-I
0		1		2	1	1	1	5		1		2
1		3		5	2	4	3	9		3		6
2		7	1	12	3	7	3	17		7	1	12
3		16	1	18	3	9	4	20		15	1	18
4		26	2	27	3	19	5	28		25	2	27
5		39	3	34	3	31	9	35		38	3	34
6		53	5	44	3	43	15	44		52	6	44
7		65	8	54	4	56	21	51	1	65	9	54
8	1	75	12	63	4	65	24	59	1	74	13	63
9	1	82	19	72	4	79	36	64	1	81	20	71
10	1	88	26	79	4	87	47	72	1	88	27	79
11	2	93	33	85	5	89	55	84	2	93	35	85
12	3	96	42	89	6	95	60	85	3	96	43	89
13	4	98	50	93	7	96	68	89	4	97	51	93
14	6	98	59	95	9	99	76	95	6	98	60	95
15	7	99	67	97	11		83	97	7	99	68	97
16	9	99	76	98	13		91	98	10	99	77	98
17	12		82	98	15		92	99	12		82	98
18	15		87	99	16		92		15		88	99
19	18		91	99	17		93		18		91	99
20	22		94	99	23		96		22		95	
21	26		97		29		97		26		97	
22	30		98		33		99		30		98	
23	34				36				34			
24	38				43				38			
25	42				49				43			
26	47				59				48			
27	52				61				53			
28	58				63				58			
29	62				67				63			
30	66				73				66			
31	70				77				70			
32	73				80				73			
33	76				81				77			
34	80				84				80			
35	82				87				82			
36	84				91				85			
37	87				91				87			
38	90				92				90			
39	92				93				92			
40	93				93				93			
41	94				95				94			
42	95				96				95			
43	96				97				96			
44	97				99				97			
45	97								97			
46	97								98			
47	98								98			
48	99								99			
49	99								99			
50	99								99			
51	99								99			
52	99								99			

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 22. Percentiles for the Paranoia Scale and Subscales of the PAI

Raw Score	Men				Women				Combined			
	PAR	PAR-H	PAR-P	PAR-R	PAR	PAR-H	PAR-P	PAR-R	PAR	PAR-H	PAR-P	PAR-R
0		1	19	2	1	3	20	3		1	19	2
1		2	39	7	2	4	40	11	1	2	39	7
2	1	5	59	14	2	5	64	19	1	5	59	15
3	2	10	74	24	3	13	69	32	2	10	73	24
4	3	18	84	37	6	20	81	37	3	18	84	37
5	5	28	90	51	9	24	91	49	5	28	90	51
6	7	42	95	66	11	47	95	65	7	42	95	66
7	10	58	97	78	13	55	96	76	10	57	97	78
8	14	71	98	86	16	60	97	87	14	71	98	86
9	18	80	99	91	20	72	97	93	18	80	99	91
10	23	87	99	96	24	83		96	23	86	99	96
11	28	92	99	98	29	87		97	28	92	99	98
12	34	94	99	99	36	95		99	34	94		99
13	41	96		99	40	97		99	41	96		99
14	49	98			47	99			48	98		
15	57	99			48				56	99		
16	63	99			57				62	99		
17	68				68				68			
18	73				69				73			
19	78				75				78			
20	82				80				82			
21	86				83				85			
22	88				87				88			
23	91				91				91			
24	92				93				92			
25	93				95				93			
26	94				95				94			
27	95				96				95			
28	96				96				96			
29	97				96				97			
30	97				97				97			
31	98				97				98			
32	98				98				98			
33	99				98				99			
34	99				98				99			
35	99				99				99			
36	99								99			

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 23. Percentiles for the Schizophrenia Scale and Subscales of the PAI

Raw Score	Men				Women				Combined			
	SCZ	SCZ-P	SCZ-S	SCZ-T	SCZ	SCZ-P	SCZ-S	SCZ-T	SCZ	SCZ-P	SCZ-S	SCZ-T
0	3	17	16	26	4	23	19	25	3	17	16	26
1	8	38	32	52	9	36	35	40	8	38	32	52
2	14	58	44	69	15	57	41	64	14	58	44	68
3	21	73	58	81	21	68	56	80	21	73	58	81
4	29	83	72	90	28	84	68	91	29	83	72	90
5	36	90	82	94	41	95	76	97	36	91	82	94
6	47	94	88	97	44	97	88	99	47	94	88	97
7	54	97	93	98	49	99	95	99	54	97	93	98
8	62	98	95	99	52		97	99	62	98	95	99
9	70	99	98		63		98		69	99	98	
10	75		99		72		99		75		99	
11	81		99		77				80		99	
12	84		99		83				84			
13	87				88				87			
14	90				93				90			
15	92				95				92			
16	94				96				94			
17	95				97				95			
18	97				97				97			
19	98				99				98			
20	98				99				98			
21	99								99			
22	99								99			
23	99								99			

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 24. Percentiles for the Borderline Features Scale and Subscales of the PAI

Raw Score	Men				Women				Combined						
	Bor	Bor-A	Bor-I	Bor-N	Bor-S	Bor	Bor-A	Bor-I	Bor-N	Bor-S	Bor	Bor-A	Bor-I	Bor-N	Bor-S
0	1	20	7	6	24	3	23	11	5	24	1	20	8	6	24
1	4	40	29	21	45	3	40	23	8	60	4	40	29	20	46
2	8	60	51	39	68	4	55	40	23	79	8	59	50	38	69
3	16	76	71	56	83	12	65	56	35	89	16	76	70	55	84
4	23	86	82	72	91	20	73	64	60	92	23	85	81	71	91
5	31	92	90	82	95	24	84	77	73	95	30	92	89	81	95
6	39	96	94	88	98	31	95	92	76	96	38	96	94	88	98
7	47	98	96	93	99	36	96	97	88	99	46	98	97	93	99
8	56	99	98	96	99	41	97	99	93	99	55	99	98	96	99
9	63	99	99	98		45	99	99	97		62	99	99	98	
10	70	99	99	98		49			99		69		99	98	
11	96			99		53			99		74		99	99	
12	80					59					78				
13	84					69					84				
14	87					75					86				
15	89					81					89				
16	92					85					91				
17	93					88					93				
18	93					91					93				
19	95					92					95				
20	96					95					96				
21	97					97					97				
22	98					98					98				
23	98					99					98				
24	99					99					99				
25	99					99					99				
26	99					99					99				
27	99					99					99				
28	99					99					99				

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 25. Percentiles for the Antisocial Features Scale and Subscales of the PAI

Raw Score	Men				Women				Combined			
	ANT	ANT-A	ANT-E	ANT-S	ANT	ANT-A	ANT-E	ANT-S	ANT	ANT-A	ANT-E	ANT-S
0	1	15	10	1	1	32	11	1	1	16	10	1
1	1	29	25	3	3	48	28	4	1	30	25	3
2	2	42	43	7	4	65	51	7	2	44	43	7
3	4	54	59	14	5	77	67	15	4	56	60	14
4	6	64	73	22	9	89	71	23	7	66	73	22
5	9	73	83	32	12	95	81	33	9	74	83	32
6	13	79	90	43	17	96	93	44	13	80	90	43
7	16	85	94	54	21	97	96	59	16	86	94	54
8	21	90	96	64	29			64	22	90	96	64
9	27	92	98	72	36			72	27	93	98	72
10	32	95	99	78	41			73	33	95	99	77
11	38	96		83	47			76	38	96		83
12	44	97		88	51			80	45	97		87
13	50	99		92	60			83	50	99		91
14	55	99		95	63			89	55	99		95
15	60	99		96	69			91	60			96
16	64			97	72			96	65			97
17	68			98	75			99	68			98
18	71			99	79			99	71			99
19	75				83				75			
20	78				84				79			
21	81				85				82			
22	83				87				84			
23	86				92				87			
24	89				93				89			
25	90				95				90			
26	92				97				92			
27	93				99				93			
28	94								95			
29	95								95			
30	96								97			
31	97								97			
32	97								98			
33	98								98			
34	98								98			
35	99								99			
36	99								99			
37	99								99			
38	99								99			
39	99								99			
40	99								99			
41	99											

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 26. Percentiles for the Alcohol Problems and Drug Problems Scales of the PAI

Raw Score	Men		Women		Combined	
	ALC	DRG	ALC	DRG	ALC	DRG
0	20	62	29	61	20	62
1	33	64	52	65	34	64
2	50	65	61	67	50	65
3	66	89	72	91	66	89
4	75	90	84	93	75	90
5	83	91	89	96	83	91
6	88	97	92	99	88	97
7	92	98	93	99	92	98
8	94	98	96		94	98
9	96	99	97		96	99
10	97	99	99		97	
11	98				98	
12	99				99	
13	99				99	

Note: Male N=1,234; Female N=75;
Combined sample N=1,309.

Table 27. Percentiles for the Aggression Scale and Subscales of the PAI

Raw Score	Males				Females				Combined			
	AGG	AGG-A	AGG-V	AGG-P	AGG	AGG-A	AGG-V	AGG-P	AGG	AGG-A	AGG-V	AGG-P
0	1	19	1	55	3	16	4	67	1	19	1	55
1	1	34	3	73	4	36	5	80	2	34	3	73
2	4	47	7	83	5	44	8	85	4	47	7	83
3	6	61	12	91	9	53	15	93	6	61	12	91
4	11	74	19	95	15	63	27	99	11	73	20	95
5	16	82	31	97	20	67	41	99	16	81	32	97
6	22	88	43	98	23	79	49		22	87	43	98
7	29	92	56	99	36	88	59		29	92	56	99
8	35	95	69		43	93	67		35	95	69	
9	43	97	80		47	95	76		43	97	80	
10	50	99	87		51	96	84		50	98	87	
11	57	99	92		55	97	85		57	99	92	
12	64		95		60	97	92		64	99	95	
13	69		97		64	99	99		68		97	
14	75		99		69		99		74		99	
15	79		99		73				78		99	
16	82				77				82			
17	86				81				86			
18	88				84				88			
19	91				87				91			
20	93				92				93			
21	94				93				94			
22	95				95				95			
23	96				95				96			
24	96				96				96			
25	97				96				97			
26	98				96				98			
27	98				97				98			
28	98				97				98			
29	99				98				99			
30	99				99				99			
31	99				99				99			
32	99				99				99			
33	99				99				99			

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 28. Percentiles for the Suicide, Stress, and Nonsupport Scales of the PAI

Raw Score	Men			Women			Combined		
	SUI	STR	NON	SUI	STR	NON	SUI	STR	NON
0	71	16	25	71	15	27	71	16	25
1	82	34	44	83	32	41	82	34	44
2	86	53	58	88	51	59	86	53	58
3	96	69	70	93	67	64	96	69	69
4	98	83	79	96	81	69	97	83	79
5	99	90	87	97	85	81	99	90	86
6	99	95	91	99	91	88	99	94	91
7		97	95		95	95		96	95
8		98	97		97	96		98	97
9		99	98		98	97		99	98
10		99	99		99	98		99	99
11			99			99			99

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

Table 29. Percentiles for the Treatment Rejection, Dominance, and Warmth Scales of the PAI

Raw Score	Men			Women			Combined		
	RXR	DOM	WRM	RXR	DOM	WRM	RXR	DOM	WRM
0				1	1	1			
1				1	1	1			
2				2	2	2			
3				2	2	2			
4				2	2	2			
5				2	2	2			
6				2	2	2			
7	1			2	2	2	1		
8	1			2	2	2	1		
9	1			2	3	2	1		
10	2			3	3	3	2		
11	3			3	3	3	3		1
12	4		1	7	4	3	4		1
13	6	1	1	12	4	4	6	1	1
14	9	1	1	15	4	4	9	1	2
15	14	2	2	19	5	5	14	2	2
16	19	2	3	28	5	5	20	2	3
17	28	3	4	32	9	7	28	3	4
18	38	5	6	47	10	8	39	5	6
19	52	8	9	65	11	9	53	8	9
20	66	12	11	79	13	12	67	12	11
21	80	16	15	91	20	19	81	16	15
22	92	23	21	99	25	27	92	23	21
23	99	30	28		43	33	99	31	28
24		38	36		49	45		39	36
25		50	43		53	48		50	43
26		59	50		59	56		59	51
27		69	58		67	59		69	58
28		78	66		72	69		78	66
29		84	72		81	73		84	72
30		91	77		85	79		91	77
31		94	84		88	84		94	84
32		96	89		97	89		96	89
33		98	93		99	93		98	93
34		99	96			95			96
35			99			99			99

Note: Male N=1,234; Female N=75; Combined sample N=1,309.

6.0 DISCUSSION

For illustrative purposes, consider the following vignettes:

Case 1: An aviator presents himself for an aeromedical waiver to return to flying status after an adjustment disorder with mixed emotional features that resulted in a reduction in his ability to function on a daily basis. He has been treated in the community at a nonmilitary clinic. You are asked to make a decision regarding his fitness to return to flying duties. His treating psychotherapist deems him “improved” and states that he is functioning better; however, she notes that she is not in a position to render a prognosis on his occupation prospects due to her unfamiliarity with the requirements of his job. The psychotherapist notes that she had a

colleague in her practice administer psychological testing, and his comment is that the testing is “within normal limits.” To better gauge this aviator’s readiness to return to flying status, you, with the written permission of the aviator, obtain the raw testing results and replot them on the profile sheets contained in this report. You note that while he is in the average range (although on the high side) on *Neuroticism* on the NEO PI-R, with a T-score of 55 (his raw score is 86), his re-plotted T-score is 60. In considering the facets, it is depression and anxiety that are most elevated, a situation that is amplified when plotted on the aviator norms profile sheets. Concerned about this man’s fitness, you decide to have a more formal psychological evaluation conducted, including administration of the PAI, and plotted on the aviator norms.

Case 2: An aviator is fatally injured when she is involved in an aviation mishap that resulted from a suspected failure to properly manage the fuel on board her aircraft. The mishap investigation board requests the premorbid psychological data that were collected on her before she entered pilot training, approximately 4.5 yr before her fatal mishap. Recognizing that the request is specifically authorized by the mishap pilot’s signed informed consent and that the information will be interpreted by a duly licensed psychologist, you comply. You ensure that this psychologist has access to the norms contained in this report. These norms reveal a NEO PI-R that is remarkable for being relatively low on *Conscientiousness* (raw score of 111, which equates to a T-score of 40 on the female aviator profile sheet). Her *Organization and Risk Taking* scales on the ALAPS are similarly at least one standard deviation (10 T-scores) below the mean compared to other female aviators. Based on this empirical evidence collected on the mishap pilot, you are in a better position to speculate on the mishap pilot’s contribution to the aircraft mishap.

7.0 CONCLUSION

The specialized norms delineated in this manuscript, as well as the profiles sheets included in the appendices, should be useful during the assessment of pilots. The norms provide better applicability to the attributes of a high-functioning subset of the general population who are quite limited in their variability. Future manuscripts will report on pilot norms on the MMPI-2-RF as well as pilot norms on cognitive tests. The goal is to offer clinicians who deal with these safety-critical professionals better tools to use when they are considering returning pilots to flying duties after the pilot has been on duties not to include flying. These norms may also be useful in forensic situations, as illustrated in Case 2 above.

Readers are cautioned that these norms were collected in a situation of no job jeopardy. These norms may have been somewhat different if the results had a direct impact on the interests of the participant. Nevertheless, they are likely superior to norms collected in a no job jeopardy situation from the general population.

While a direct comparison of an individual's abilities and attributes provides the best measure of a pilot's level of impairment (or, more positively, degree of rehabilitation) after a psychiatric illness or neurological insult, these norms will serve the assessing psychologist better than commercially published norms that are based on the general population. Lacking individual baseline data, comparison of the referred pilot to these norms will best ensure that pilots are returned to duty in the most efficient manner possible so that they may safely continue to fly, fight, and win.

8.0 REFERENCES

1. King RE, Flynn CF, "Defining and Measuring the "Right Stuff": Neuropsychiatrically Enhanced Flight Screening (N-EFS), *Aviation, Space, and Environmental Medicine*, **66**(1), Oct 1995, pp. 951-6.
2. Retzlaff PD, King RE, McGlohn SE, Callister JD, *The Development of the Armstrong Laboratory Aviation Personality Survey (ALAPS)*, AL/AO-TR-1996-0108, Armstrong Laboratory, Brooks AFB, TX, Aug 1996.
3. Retzlaff PD, Callister JD, King RE, *The Armstrong Laboratory Aviation Personality Survey (ALAPS): Norming and Cross-Validation*, AL/AO-TR-1997-0099, Armstrong Laboratory, Aerospace Medicine Directorate, Brooks AFB, TX, Jul 1997.
4. Barto E, Chappelle W, King RE, Ree MJ, Teachout MS, *The NEO-PI-R as a Premorbid Baseline Measure*, AFRL-SA-WP-TR-2011-0001, U.S. Air Force School of Aerospace Medicine, Aerospace Medicine Research Division, Brooks City-Base, TX, Mar 2011.
5. Fine PM, Hartman BO, *Psychiatric Strengths and Weaknesses of Typical Air Force Pilots*, SAM-TR-68-121, U.S. Air Force School of Aerospace Medicine, Aerospace Medical Division, Brooks AFB, TX, Nov 1968.
6. King RE, "Assessing Aviators for Personality Pathology with the Millon Clinical Multiaxial Inventory (MCMI)," *Aviation, Space, and Environmental Medicine*, **65**(3), Mar 1994, pp. 227-31.
7. Kay GG, "Guidelines for the Psychological Evaluation of Air Crew Personnel," *Occupational Medicine: State of the Art Reviews*, **17**(2), 2002, pp. 227-45.
8. Williams CA, King RE, *The Effects of Testing Circumstance and Education Level on MMPI-2 Correction Scale Scores*, DOT/FAA/AM-10/3, Federal Aviation Administration, Civil Aerospace Medical Institute, Oklahoma City, OK, Feb 2010.
9. Costa PT, McCrae RR, **The NEO Personality Inventory Manual**, Psychological Assessment Resources, Odessa, FL, 1985.
10. Morey LC, **Personality Assessment Inventory**. Psychological Assessment Resources, Lutz, FL, 1991.

APPENDIX A

ALAPS Profile Sheets

Armstrong Laboratory Aviation Personality Survey (ver 0.1)

Name: _____ Age: _____ Profile Sheet: **MALE**

	Confidence	Socialness	Aggressiveness	Orderliness	Negativity	Affective Lability	Anxiety	Depression	Alcohol Abuse	Dogmatism	Deference	Team Oriented	Organization	Impulsivity	Risk Taking	
90	-	-	-	-	-	-	-15	-11	-	-	-	-	-	-	-	90T
	-	-	-	-	-16	-16	-	-	-	-16	-16	-	-	-	-	
80	-	-	-	-	-15	-15	-12	-9	-	-15	-15	-	-	-	-	80
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70	-16	-	-16	-	-12	-12	-9	-6	-15	-12	-12	-	-	-16	-	70
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	-13	-16	-12	-16	-9	-8	-6	-4	-11	-9	-9	-16	-16	-11	-15	60
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-16	
50	-10	-13	-9	-12	-5	-4	-2	-2	-7	-6	-6	-12	-12	-7	-12	50T
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40	-7	-9	-6	-9	-2	-1	-	-	-3	-4	-3	-8	-9	-3	-9	40
	-	-	-	-	-	-0	-	-	-	-	-	-	-	-	-	
30	-4	-6	-3	-5	-	-	-	-	-0	-1	-0	-4	-6	-0	-7	30
	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	-	
20	-1	-2	-0	-2	-	-	-	-	-	-	-	-1	-2	-	-4	20
	-0	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1	10
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0T
	CO	SO	AG	ORD	NE	AF	AN	DE	AL	DO	DE	TE	ORG	IM	RI	

Armstrong Laboratory Aviation Personality Survey (ver 0.1)

Name: _____ Age: _____ Profile Sheet: **FEMALE**

	Confidence	Socialness	Aggressiveness	Orderliness	Negativity	Affective Lability	Anxiety	Depression	Alcohol Abuse	Dogmatism	Deference	Team Oriented	Organization	Impulsivity	Risk Taking	
90	-	-	-	-	-	-	-	-12	-	-15	-	-	-	-	-	90T
	-	-	-	-	-16	-	-	-	-	-	-16	-	-	-	-	
80	-16	-	-	-15	-	-	-16	-10	-	-12	-15	-	-	-	-	80
	-	-	-16	-	-	-	-	-	-16	-	-	-	-	-16	-	
70	-14	-	-14	-	-11	-16	-11	-7	-14	-10	-12	-	-	-15	-	70
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	-11	-16	-11	-16	-8	-11	-7	-4	-10	-7	-9	-16	-16	-11	-15	60
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
50	-8	-13	-8	-13	-5	-7	-3	-2	-6	-4	-6	-12	-13	-7	-11	50T
	-	-	-	-	-	-	-	-0	-	-	-	-	-	-	-	
40	-5	-9	-5	-9	-2	-2	-0	-	-3	-3	-3	-8	-10	-3	-8	40
	-	-	-	-	-0	-0	-	-	-0	-0	-	-	-	-	-	
30	-2	-6	-2	-6	-	-	-	-	-	-	-0	-4	-6	-0	-5	30
	-0	-	-0	-	-	-	-	-	-	-	-	-	-	-	-	
20	-	-2	-	-2	-	-	-	-	-	-	-	-0	-3	-	-1	20
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	
10	-	-0	-	-0	-	-	-	-	-	-	-	-	-0	-	-	10
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0T
	CO	SO	AG	ORD	NE	AF	AN	DE	AL	DO	DE	TE	ORG	IM	RI	

Armstrong Laboratory Aviation Personality Survey (ver 0.1)

Name: _____ Age: _____ Profile Sheet: **COMBINED**

	Confidence	Socialness	Aggressiveness	Orderliness	Negativity	Affective Liability	Anxiety	Depression	Alcohol Abuse	Dogmatism	Deference	Team Oriented	Organization	Impulsivity	Risk Taking	
90	-	-	-	-	-	-	-16	-11	-	-	-	-	-	-	-	90T
	-	-	-	-	-16	-	-	-	-	-16	-16	-	-	-	-	
80	-	-	-	-	-15	-16	-13	-9	-	-15	-15	-	-	-	-	80
	-	-	-16	-	-	-	-	-	-16	-	-	-	-	-16	-	
70	-16	-	-15	-	-12	-12	-9	-6	-15	-12	-12	-	-	-15	-	70
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	-13	-16	-12	-16	-9	-8	-6	-4	-11	-9	-9	-16	-16	-11	-15	60
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-16	
50	-10	-13	-9	-12	-5	-5	-2	-2	-7	-6	-6	-12	-13	-7	-12	50T
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40	-7	-9	-6	-9	-2	-1	-	-	-3	-3	-4	-8	-9	-3	-9	40
	-	-	-	-	-	-0	-	-	-	-	-	-	-	-	-	
30	-3	-6	-3	-5	-	-	-	-	-0	-0	-1	-4	-6	-0	-6	30
	-	-	-	-	-	-	-	-	-	-	-0	-	-	-	-	
20	-0	-2	-0	-2	-	-	-	-	-	-	-	-1	-2	-	-4	20
	-	-	-	-0	-	-	-	-	-	-	-	-0	-	-	-	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1	10
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0T
	CO	SO	AG	ORD	NE	AF	AN	DE	AL	DO	DE	TE	ORG	IM	RI	

APPENDIX B

NEO PI-R Profile Sheets

NEO PI-R

Name: _____ Age: _____ Profile Sheet: **MALES**

	Neuroticism	Extraversion	Openness to Experience	Agreeableness	Conscientiousness	
90	-141	-	-	-	-	90T
	-	-	-183	-176	-	
	-	-187	-	-	-	
80	-123	-179	-167	-164	-	80
	-	-	-	-	-182	
	-	-	-	-	-	
70	-105	-162	-149	-148	-167	70
	-	-	-	-	-	
	-	-	-	-	-	
60	-86	-145	-131	-131	-149	60
	-	-	-	-	-	
	-	-	-	-	-	
50	-68	-128	-113	-115	-131	50T
	-	-	-	-	-	
	-	-	-	-	-	
40	-49	-111	-95	-98	-114	40
	-	-	-	-	-	
	-	-	-	-	-	
30	-31	-93	-77	-82	-96	30
	-	-	-	-	-	
	-	-	-	-	-	
20	-13	-76	-59	-65	-79	20
	-6	-	-	-	-	
	-	-	-	-	-	
10	-	-58	-41	-47	-62	10
	-	-55	-40	-	-	
	-	-	-	-36	-50	
0	-	-	-	-	-	0T
	N	E	O	A	C	

— — — — —

Name: _____ Age: _____ Profile Sheet: **FEMALES**

Neuroticism
Extraversion
Openness to Experience
Agreeableness
Conscientiousness

NEO PI-R

Name: _____ Age: _____

Profile Sheet: **COMBINED**

	Neuroticism	Extraversion	Openness to Experience	Agreeableness	Conscientiousness	
90	-142	-	-	-	-	90T
	-	-	-183	-176	-	
	-	-187	-	-	-	
80	-124	-180	-168	-166	-	80
	-	-	-	-	-182	
	-	-	-	-	-	
70	-106	-162	-150	-149	-168	70
	-	-	-	-	-	
	-	-	-	-	-	
60	-87	-145	-132	-132	-149	60
	-	-	-	-	-	
	-	-	-	-	-	
50	-68	-128	-114	-115	-131	50T
	-	-	-	-	-	
	-	-	-	-	-	
40	-50	-111	-95	-99	-114	40
	-	-	-	-	-	
	-	-	-	-	-	
30	-31	-94	-77	-82	-96	30
	-	-	-	-	-	
	-	-	-	-	-	
20	-12	-76	-59	-65	-78	20
	-6	-	-	-	-	
	-	-	-	-	-	
10	-	-58	-41	-50	-60	10
	-	-55	-40	-	-	
	-	-	-	-36	-50	
0	-	-	-	-	-	0T
	N	E	O	A	C	

NEO PI-R Facets

Name: _____ Age: _____ Profile Sheet: **MALES**

	N1	N2	N3	N4	N5	N6	E1	E2	E3	E4	E5	E6	O1	O2	O3	O4	O5	O6	A1	A2	A3	A4	A5	A6	C1	C2	C3	C4	C5	C6	
90	-31	-30	-27	-	-	-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90T	
	-	-	-	-29	-32	-	-	-	-	-	-	-	-	-	-	-32	-	-	-	-	-	-32	-	-	-	-	-	-	-	-	
80	-26	-25	-23	-25	-28	-16	-	-	-	-32	-	-	-	-	-	-29	-	-	-	-	-	-29	-31	-30	-	-32	-	-	-32	-30	80
	-	-	-	-	-	-	-	-32	-32	-	-	-	-32	-32	-32	-	-	-	-	-32	-32	-	-	-	-	-	-	-	-	-	
70	-21	-21	-19	-21	-24	-13	-31	-29	-29	-28	-31	-30	-28	-27	-29	-25	-32	-28	-29	-28	-31	-25	-26	-26	-31	-28	-31	-31	-31	-26	70
	-	-	-	-	-	-	-32	-	-	-	-32	-32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	-17	-16	-14	-17	-19	-10	-27	-24	-25	-24	-27	-26	-23	-22	-25	-21	-27	-24	-25	-24	-27	-20	-22	-22	-28	-23	-28	-27	-27	-22	60
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
50	-12	-12	-10	-13	-15	-7	-23	-19	-20	-21	-23	-21	-18	-16	-21	-17	-22	-19	-20	-19	-24	-16	-17	-19	-24	-19	-24	-23	-23	-18	50T
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40	-8	-7	-6	-8	-10	-3	-19	-14	-16	-17	-20	-17	-13	-10	-16	-13	-17	-15	-16	-15	-20	-12	-12	-15	-21	-15	-21	-19	-19	-14	40
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30	-3	-3	-1	-4	-6	-0	-15	-9	-11	-15	-16	-13	-8	-5	-12	-9	-12	-10	-12	-10	-17	-8	-7	-11	-18	-10	-17	-15	-14	-10	30
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20	-0	-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-0	-1	-	-11	-4	-7	-10	-12	-8	-3	-0	-8	-5	-6	-6	-7	-6	-13	-4	-3	-7	-15	-6	-13	-12	-10	-5	20
	-	-	-	-	-0	-	-	-	-	-	-	-	-1	-	-	-3	-	-	-	-2	-	-0	-0	-	-	-	-	-	-	-	
10	-	-	-	-	-	-	-8	-	-3	-	-9	-4	-	-	-4	-	-	-1	-3	-10	-	-	-	-4	-11	-2	-10	-8	-7	-1	10
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-0	-1	-	-	-	-2	-10	-1	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-1	-	-	-	-	-	-5	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-3	-2	-	0T

N1 N2 N3 N4 N5 N6 E1 E2 E3 E4 E5 E6 O1 O2 O3 O4 O5 O6 A1 A2 A3 A4 A5 A6 C1 C2 C3 C4 C5 C6

NEO PI-R Facets

Name: _____ Age: _____ Profile Sheet: **COMBINED**

	N1	N2	N3	N4	N5	N6	E1	E2	E3	E4	E5	E6	O1	O2	O3	O4	O5	O6	A1	A2	A3	A4	A5	A6	C1	C2	C3	C4	C5	C6	P	
90	-31	-30	-27	-	-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90T	
80	-26	-25	-23	-25	-28	-17	-	-	-	-32	-	-	-	-	-	-29	-32	-	-	-	-	-32	-31	-30	-	-32	-	-	-	-32	80	
70	-	-	-	-	-	-	-32	-32	-	-	-32	-32	-32	-32	-32	-29	-32	-	-	-32	-32	-	-	-	-32	-32	-32	-32	-32	-32	70	
60	-17	-16	-14	-17	-19	-10	-27	-24	-25	-24	-27	-26	-23	-22	-22	-25	-21	-27	-24	-25	-24	-27	-20	-22	-22	-20	-23	-20	-27	-27	-22	60
50	-12	-12	-10	-13	-15	-7	-23	-19	-20	-21	-23	-22	-18	-16	-21	-17	-22	-19	-20	-19	-24	-16	-17	-19	-19	-24	-19	-24	-23	-23	-18	50T
40	-8	-7	-6	-8	-10	-3	-19	-14	-16	-17	-19	-17	-13	-11	-17	-13	-17	-15	-16	-15	-20	-12	-12	-15	-21	-15	-21	-19	-19	-14	40	
30	-3	-3	-1	-4	-6	-0	-15	-9	-11	-13	-16	-13	-8	-5	-12	-9	-12	-10	-12	-10	-17	-8	-8	-11	-18	-10	-17	-15	-14	-10	30	
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0T	

APPENDIX C

PAI Profile Sheets

PAI Full Scales

Name: _____ Age: _____ Profile Sheet: **MALE**

	icn	inf	nim	pim	alc	drg	sui	str	non	rxr	dom	wrm	som	anx	ard	dep	man	par	scz	bor	ant	agg
110	-	-	-6	-	-	-	-	-16	-	-	-	-	-	-	-	-	-	-	-	-	-	110T
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-41	-	-46
100	-	-	5	-	-	-	8	-13	-16	-	-	-	-	-	-	-28	-	-	-	-	-	100
	-13	-	-	-	-	-12	-	-	-	-	-	-	-16	-33	-36	-27	-	-46	-	-36	-	-
90	-12	-	4	-	-15	-10	7	-12	-13	-	-	-	-13	-28	-33	-23	-62	-41	-27	-31	-45	-36
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90
	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	-10	-8	3	-	-12	-9	5	9	-10	-	-	-	-11	-23	-28	-19	-53	-35	-23	-25	-38	-30
	-	-	-	-	-	-	-	-	-	-	-36	-	-	-	-	-	-	-	-	-	-	80
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	-7	-6	-	-26	-9	-6	4	7	8	-	-34	-36	8	-18	-23	-14	-45	-28	-18	-20	-31	-24
	-	-	2	-	-	-	-	-	-24	-	-	-	-	-	-	-	-	-	-	-	-	70T
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-5	-4	-	-23	-6	-4	2	5	5	-22	-30	-31	5	-13	-18	-10	-36	-22	-13	-14	-23	-18
	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-3	-3	-	-19	-3	-1	1	3	3	-19	-25	-26	3	8	-13	5	-27	-15	8	9	-15	-11
	-	-	0	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	-1	-1	-	-15	-0	-	-	0	-16	-	-21	-21	0	2	8	1	-19	9	3	3	7	5
	-0	0	-	-	-	-	-	-	-	-	-	-	-	0	-	0	-	-	-	-	-	40
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-11	-	-	-	-	-	-13	-17	-16	-	-	3	-	-10	2	0	0	0	0
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	30
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-7	-	-	-	-	-	9	-13	-12	-	-	-	-	2	-	-	-	-	20T
icn inf nim pim alc drg sui str non rxr dom wrm som anx ard dep man par scz bor ant agg																						

Profile Sheet: **FEMALE**

Age:

Name:

[illegible]

PAI Full Scales

Name: _____ Age: _____ Profile Sheet: **COMBINED**

	icn	inf	nim	pim	alc	drg	sui	str	non	rxr	dom	wrm	som	anx	ard	dep	man	par	scz	bor	ant	agg	
110	-	-	-	6	-	-	-	9	-16	-	-	-	-	-	-	-	-	-	-	-	-	110T	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-41	-	-46	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
100	-	-	-	5	-	-	-	8	-13	-16	-	-16	-33	-	-28	-	-	46	-	-36	-	100	
	13	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-16	-	-	-	-	-	-	-	-	-36	-	-	-	-	-	-49	-	-	
90	-12	-	4	-	-15	-10	7	-12	-13	-	-	-13	-29	-33	-23	-62	-41	-27	-31	-45	-36	90	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
80	-10	-8	3	-	-12	-9	5	9	-10	-	-36	-	-11	-23	-19	-53	-35	-23	-26	-38	-30	80	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70	7	6	-	26	9	6	4	7	8	-24	34	36	8	18	24	14	45	28	18	20	30	24	70T
	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	-5	-5	-	-23	-6	4	2	5	5	-22	-30	-31	6	-13	-13	-10	-36	-22	-13	-14	-23	-18	60
	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
50	-3	-3	-	-19	-3	1	1	3	3	-19	-25	-26	3	8	-13	5	-27	-15	8	9	-15	-11	50
	-	-	0	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40	-1	1	-	-15	-0	-	-	0	0	-16	-21	-21	0	2	8	1	-19	9	3	3	7	5	40
	-	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	-	-	0	0	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30	-	-	-	-11	-	-	-	-	-	-12	-17	-16	-	3	-	-10	2	-	-	0	0	30	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	
20	-	-	-	-	-	-	-	-	-	-	-13	-11	-	-	-	-	2	-	-	-	-	20T	
icn inf nim pim alc drg sui str non rxr dom wrm som anx ard dep man par scz bor ant agg																							

Name: _____ Age: _____ Profile Sheet: **MALES**

PAI Subscales

Name: _____ Age: _____ Profile Sheet: **FEMALES**

	SOM-C	SOM-S	SOM-H	ANX-C	ANX-A	ANX-D	Ard-O	Ard-P	Ard-T	Dcp-C	Dcp-A	Dep-P	Man-A	Man-G	Man-T	Par-H	Par-D	Par-R	SCZ-P	SCZ-S	SCZ-T	ROR-A	ROR-T	BOR-N	BOR-S	ANL-A	ANT-E	ANT-S	AGG-A	AGG-V	AGG-P
120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110T
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70T
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20T

PAI Subscales

Name: _____ Age: _____ Profile Sheet: **COMBINED**

Som C	Som S	Som H	Anx C	Anx A	Anx P	Ard O	Ard P	Ard T	Dep C	Dep A	Dep P	Man A	Man C	Man I	Par H	Par P	Par R	Scz P	Scz S	Scz T	Bor A	Bor I	Bor N	Bor S	Ant A	Ant E	Ant S	Agg A	Agg V	Agg P
110	- 4 -	- 11 -	-	-	-	-	-	- 13 -	-	-	-	-	-	-	-	-	-	- 15 -	- 15 -	-	-	-	-	-	-	-	-	-	- 11 -	110
-	-	-	-	-	-	-	-	-	- 11 -	- 12 -	-	-	-	-	-	- 15 -	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	- 16 -	- 13 -	-	-	-	- 11 -	- 9 -	- 10 -	- 14 -	-	-	-	-	- 14 -	-	-	- 13 -	- 17 -	- 11 -	- 13 -	- 16 -	- 11 -	-	-	-	-	- 10 -	100
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

LIST OF ABBREVIATIONS AND ACRONYMS

ACS	Aeromedical Consultation Service
ALAPS	Armstrong Laboratory Aviation Personality Survey
MAB-II	Multidimensional Aptitude Battery-Second Edition
MMPI	Minnesota Multiphasic Personality Inventory
NEO PI-R	Revised NEO Personality Inventory
PAI	Personality Assessment Inventory
PIQ	performance intelligence quotient
SD	standard deviation
SUPT	Specialized Undergraduate Pilot Training
USAF	United States Air Force