

Relationships between Personality, Stress Coping, and Performance among Pilots in a Collegiate Flight Training Program

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Abstract

Aviation Psychologists have long been interested in identifying personality and other characteristics that allow pilots to successfully cope with the stress associated with flight training. The majority of these efforts, however, have focused on military aviators. Consequently little is known about the role played by personality and stress coping variables in the training success of civil aviation pilots. Therefore, our study examined the relationship between personality, stress coping, and performance of student pilots in a collegiate flight training program. Participants were students enrolled in the Professional Pilot Training Program at the Institute of Aviation, University of Illinois at Urbana-Champaign. They were administered a personality test during the first week of their training. Midway through the semester, a stress coping questionnaire was also completed by students. Students' grades and other flight performance data were then collected at the end of the semester. Results indicated that personality characteristics were differentially and significantly correlated with specific stress coping strategies adopted by student pilots. Also, both personality and stress coping scores predicted various performance variables, including ground school grades, pre-solo marks, pre-solo hours, and check-ride success. Findings support results of previous research using military pilots. Application of the results could aid in the development of better selection, training and safety programs for the civil aviation industry.

Purpose

To examine the relationship between personality, stress coping and performance of student pilots in a collegiate flight training program.



Results

Personality	16 PF Norm	Student Pilots
Five Global Factors		
Extraversion	5.65 (1.87)	6.19 (1.58)*
Anxiety	5.44 (2.44)	5.06 (1.88)*
Self-Control	5.38 (1.94)	4.61 (1.55)*
Independence	5.66 (1.81)	5.77 (1.84)
Tough-Minded	5.63 (1.76)	6.11 (2.08)*
16 Sub-factors		
Warmth	5.70 (2.08)	5.46 (1.87)*
Reasoning	5.51 (2.10)	6.28 (1.65)*
Emotional Stability	5.80 (2.02)	6.12 (1.82)*
Dominance	5.61 (2.06)	5.71 (2.15)
Liveliness	5.65 (1.81)	6.81 (1.35)*
Rule Conscious	5.33 (1.95)	5.05 (1.65)
Social Boldness	5.61 (1.96)	5.79 (2.04)
Sensitivity	5.58 (2.10)	4.43 (2.21)*
Vigilance	5.67 (2.04)	6.14 (1.77)*
Abstractness	5.58 (1.98)	5.76 (1.87)
Privateness	5.49 (1.81)	5.18 (1.78)
Apprehension	5.42 (2.00)	5.35 (1.79)
Open to Change	5.55 (1.95)	5.28 (2.02)
Self Reliance	5.42 (1.92)	4.86 (1.56)*
Perfectionism	5.42 (1.82)	4.77 (1.83)*
Tension	5.37 (1.88)	4.89 (1.73)

Personality Profiles

Overall, student scores on five global personality factors and 16 primary personality factors were within the normal range of 4-7 for all factors. However, differences were statistically significant from the norm on four global and seven primary personality factors.

*Significant difference from development norm based on two-tailed t-test (p<.05)

Discussion

Personality and Stress Coping

- Student pilots have a tendency to be more extraverted, reasonable, vigilant, emotionally stable, and tough minded yet less self controlled compared to normative data.
- However, student pilots scored lower on almost all coping strategies, suggesting that they have yet to develop mature ways to deal with the stresses of "real life."
- More extroverted students tended to use seeking social support for instrumental reasons and positive reinterpretation and growth coping strategies. Students with high anxiety tended to utilize behavioral and mental disengagement strategies.
- The significant correlations between personality and coping indicate that personality can be used to predict the type of coping strategies that student pilots will adopt.
- This information may allow interventions to be developed to improve coping strategies for certain pilots that need help dealing with the stressful flight training environment.

Predicting Performance

- Significant correlations between personality and performance variables revealed that different types of personalities may affect students' performance.
- Flight performance was influenced most by Independence and Extraversion, relative to openness to change, warmth and dominance. Ground school performance was influenced more by self control and rule consciousness.
- The coping strategies adopted by pilots might affect the overall performance. Broadly, our pilots did not report using problem solving strategies. Rather, they appeared to use less mature approaches such as disengagement and venting.
- These coping strategies may not be as effective in other contexts, such as within a commercial or military aviation environment.



Method

Participants: 98 students enrolled in the professional Pilot Training Program at the Institute of Aviation, University of Illinois at Urbana-Champaign.

Measures:

Personality Questionnaire: All participants were administered the Cattell's 16PF test on the first day of their ground school at the beginning of the academic year. The 16PF test is a multidimensional set of sixteen questionnaire scales consisting of 185 questions.

Coping Questionnaire: Midway through the semester approximately eight weeks later, a stress coping questionnaire was also completed by students.

Performance Data: Students' grades and other flight performance data were then collected at the end of the semester. The performance variables included ground school grades, flight grades, presolo marks, presolo hours, and check-ride success.

Cope	Extra-version	Anxiety	Tough-minded	Independence	Self control
Active.C	.12	-.12	.002	.11	.13
Planning	.05	.02	.01	.14	.17
Suppression	-.001	.01	.00	.09	.21*
Instrumental support	.23*	.003	-.16	.15	-.08
Emotional support	.19	.16	-.30**	-.06	-.23*
Venting of emotions	.06	.32**	-.26**	.07	-.18
Denial	.02	.22*	-.21*	-.04	-.16
Behavioral diseng.	-.008	.21*	-.10	-.24*	-.17
Mental diseng.	.11	.28**	-.19	-.23*	-.27**
Acceptance	.04	-.05	.02	-.17	-.01
Growth	.20*	-.29**	.003	.02	.09
Restraint.C	-.13	.07	-.02	-.11	-.11
Religion	.12	-.11	-.03	-.01	-.29**
Alcohol	.10	.10	-.18	.01	-.40**

Relationship between Global Personality factors and COPE scales

All five global personality factors were correlated with more than one coping strategy, except problem focused strategies.

Statistical significance based on Pearson's correlation.
* p<.05 (2-tailed)
** p<.01 (2-tailed)

Conclusion

Personality characteristics of the student pilots were significantly correlated with specific coping strategies adopted by the pilots. Also, both personality and stress coping predicted performance variables. While personality is considered a more stable, long-term characteristic, coping styles show greater malleability, and thus, opportunity for change. These opportunities mean instructors, supervisors, and counselors have numerous places to make improvements in student pilots coping choices via selection, training, and counseling. One should also consider that differences in coping strategies might affect more than performance. For example, coping style may affect self monitoring and the willingness to admit problems. Such insight could be valuable for teaching both aviation and stress coping skills to students, as well as improving aviation safety programs in general.

Introduction

- In recent years, the relationship between personality characteristics, stress coping styles and job performance of successful and safe pilots has received considerable attention in the field of aviation.
- Number of studies found pilots to be dominant, action oriented, less inclined towards introspection, outgoing, emotional, sensitive and self effacing (Ashman & Teller, 1983; Fine & Hartman, 1968; Retzlaff & Gibertini, 1978)
- Results from studies of pilot coping (Ashman & Teller, 1983; Retzlaff & Gibertini, 1977; Piccano, 1990) indicate that military pilots were more inclined towards problem solving coping strategies and relied less upon emotional support, denial or disengagement coping strategies.
- To date, the study of personality factors in flight performance has involved the use of military crew. Few studies have examined the role of personality on the performance of civil aviation pilots and stress coping during flight training.
- It is quite possible that there may be considerable differences between successful military pilots and aviators within civil aviation environment.



Relationship between personality, stress coping and performance variables

Some personality characteristics and stress coping strategies predicted performance.

Statistical significance based on Pearson's correlation.
* p<.05 (2-tailed)
** p<.01 (2-tailed)



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