

***FLIGHT INSTRUCTOR GRADING BIAS INVOLVING STUDENTS WITH
RACIAL, ETHNIC AND GENDER DIFFERENCES***

by

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Abstract

Of 1038 naval flight students, 943 Caucasian males, 23 African American males, 41 Hispanic males and 31 females had their flight training performance analyzed. Aviation selection test scores, academic grades and flight grades were examined to determine objective and subjective grading reliability. To facilitate cross comparison all test scores were transformed into Navy Standard Scores with a mean of 50 and standard deviation of 10. It was hypothesized that flight instructor grading bias would appear as inconsistent means and/or variances compared to objectively derived aptitude and academic performance. Comparing flight instructor subjectively determined flight grades to objectively determined aptitude scores and academic grades revealed no significant difference for Caucasians, African American or Hispanic males. However, there was significant difference between female aptitude scores and flight grades. Female flight grades were significantly higher than aptitude scores would predict. No other differences were found. Conclusions about flight instructor grading bias is fairly clear. For males there appears to be no bias. For females the bias is positive, ie., higher flight grades than would be predicted by their flight aptitude scores. In general, flight instructors grading patterns were extremely consistent when compared to objectively determined aptitude and academic test scores.

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"Black aviators often face subtle and 'intangible' forms of discrimination such as tougher grading in flight school and promotion evaluations." These comments were made by a African American Naval Commander assigned to the Navy's personnel department. He goes on to state that only 2.1 percent of Naval aviators are black (opposed to 12 percent for the general population). Black aviators are assigned to fighter and attack planes at barely half the rate of white aviators and there are only two commands out of 93 aviation commands that are held by blacks. Furthermore, these discrepancies are responsible for low morale and higher attrition rates (twice the rate of whites) among black aviators (Pensacola News Journal, 1992).

Other minorities as well as females have made similar accusations of subtle bias especially about flight instructors who consciously or unconsciously grade them lower than male Caucasians. Based on these allegations, the Navy instructed a review of Navy flight instructor grading procedures with emphasis on determining the possibility of grading bias.

Method

Subjects - Of 1038 naval flight students 943 Caucasian males, 23 African American males, 41 Hispanic males and 31 female

naval flight students had their performance analyzed.

Performance was determined to be objectively or subjectively derived. Aviation selection test scores and academic ground school grades are both machine scored and, therefore, objectively derived. Flight grades on the other hand are subjectively derived based on flight instructor ratings of specific flight performance. In order to compare performance across the various type of scoring and/or grading procedures, all raw scores were converted to Navy Standard Scores (NSS) with a mean of 50 and a standard deviation of 10. To compute an NSS from a group of raw scores calculate a mean and a standard deviation. Take each raw score and subtract the group mean and multiply the result by 10 then add 50. In a normal distribution the NSS will range from a low of 20 to a high of 80 with a mean of 50. Each 10 points is equivalent to one standard deviation. This procedure allows a direct performance comparison between test scores with dissimilar units of measurement (Sax, 1980).

All flight students had Aviation Selection Test Battery (ASTB) scores, ground school grades and flight grades. The ASTB has the following components that predict academic and flight training success:
a. Academic Qualification Rating (AQR) -

Predicts academic aptitude.

b. Pilot Flight Aptitude Rating - Predicts Pilot flight aptitude.

c. Flight Officer Aptitude Rating (FOFAR) - Predicts NFO flight aptitude.

d. Pilot Biographical Inventory (PBI) - Predicts Pilot interest.

f. Flight Officer Biographical Inventory (FOBI) - Predicts NFO interest.

All ASTB scores are reported in stanines. Stanines range from a low of 1 to a high of nine with 5 as average. All ASTB scores were converted to the NSS with a mean of 50 and a standard deviation of 10 (Sax, 1980).

Academic performance was derived by grades on three ground school courses (1) Aerodynamics, (2) Engines, and (3) Navigation. All three course scores were combined into an equally weighted composite then converted to an NSS score with a mean of 50 and a standard deviation of 10.

Finally, flight grades are scored on a 1-4 point scale. One is the low and four is the high, the average is 3.0. All flight scores were converted to an NSS with a mean of 50 and a standard deviation of 10.

Results

Mean score for each group for the dependent variables are shown in Table 1 on following page.

Naval Standard Scores for each group for the dependent variables are shown in Table 2 on following page..

A z or t-score analysis was performed for each category of dependent variable. A

significant z of 2.57 ($p < .02$) was found between female PFAR scores and flight scores. All other z's or t's were non-significant.

Discussion

The claim that minority and/or female flight students face tougher grading standards than their majority or male counterparts is not supported by the study. The only difference in flight instructor grading occurred with female flight students. Female flight students received significantly higher flight grades (46.4) than was predicted by their flight aptitude scores (41.3).

There were no significant differences for Caucasians, African American or Hispanic males. Conclusions about flight instructor grading bias is fairly clear. For males there appears to be no bias in grading. For females the bias is positive, ie., higher flight grades than would be predicted by their flight aptitude scores. In general, flight instructors' grading patterns were extremely consistent when compared to objectively determined aptitude and academic test scores.

Table 1

Mean scores by Race, Ethnic or Gender code

Code	Number	AQR	PFAR	FOFAR	PBI	FOBI	ACAD	FLT
CAUC	943	5.96	6.20	5.74	6.15	5.33	50.88	51.37
AF AM	23	3.69	4.21	3.49	4.08	3.64	44.39	45.11
HISP	41	5.14	5.40	4.90	5.24	4.48	49.02	47.81
FEMALE	31	4.67	4.67	4.70	5.23	4.99	47.36	47.60
TOTAL	1038	5.86	6.04	5.59	5.99	5.23	50.42	50.88

*ASTB scores are in stanines (Range 1-9)

Table 2

Naval Standard Scores by Race, Ethnic, or Gender Code

Code	Number	AQR	PFAR	FOFAR	PBI	FOBI	ACAD	FLT
CAUC	943	50.9	51.0	50.8	50.8	50.5	50.7	50.5
AF AM	23	37.9	39.5	38.1	40.2	42.1	41.3	43.6
HISP	41	46.2	46.2	46.1	46.1	46.3	48.0	46.6
FEMALE	31	43.5	41.8	45.0	46.1	48.8	45.6	46.4
TOTAL	1038	50.0	50.0	50.0	50.0	50.0	50.0	50.0

* Significant .05

References

Anonymous. Pentagon: Navy Aviation discriminates. Pensacola News Journal, October 14, 1992.

Sax, G. Principles of Educational and Psychological Measurement and Evaluation. California: Wadsworth Publishing Company, 1980.