

An Analysis of the Correlation between the “Elite-ization” of the Air Force and the Academy GPA

BRIG GEN LEE, JAE KEE

Commandant, Air Command and Staff College Seoul, Korea

I. Introduction

The Background and Purpose of the Study

1. The Background of the Study

This study analyzed the Correlation between the Air Force officers who were promoted to the high class ranks through competitive “elite-ization” among the Air Force Academy graduates and their grade point averages (GPA's) in the academy. The population of the study included the generals and colonels who graduated from the Air Force Academy.

If the correlation between the high positions of the regular college/university graduates in companies and their GPA's in colleges/universities had been analyzed, the result would have no universal validity because it means the comparison between positions among different companies and GPA's among different colleges/ universities. In case of the Air Force officers, however, they go through the unified curriculum, work in the same area after being commissioned as second lieutenants, and are promoted to higher ranks through a competitive selection process. Thus, a positive correlation could conceivably be shown.

2. The Purpose of the Study

The influence of the Air Force Academy of the Republic of Korea on the elite officers is significant. This education equips the officers to be soldiers, intellectuals, and capable commanders of the Air Force which is a vital part of the national Armed

Forces. Since, however, their GPA's in the academy are not put into consideration as they are evaluated for promotion, it is not known whether the "elite-ization" of competitive promotion is related to their GPA's in the academy.

Some studies conducted in the United States since the end of World War I have proven that the cadets' GPA's in the Air Force Academy and their promotion after graduation are not correlated. Tagler's study on the graduates from the West Point showed that the GPA in the academy and on the job performance after graduation are not correlated. Howerton after an intensive study also concluded that they do not have clear correlation.

Therefore, the writer purports to study whether the same study in the Korean context produces the same result or not. If it results in a different conclusion, it will provide the cadets in the academy with a strong incentive to study harder and also provide some guidelines for the improvement of the curriculum in the academy.

The Scope and Method of the Study

1. The Scope of the Study

As of the end of 1992, the Republic of Korea Air Force Academy has produced generals from eighteen classes of 1953-70 and colonels from the classes of 1970-75, and all of those generals and colonels are considered elite officers. The population of this study includes those generals and colonels from the classes of 1953-75.

2. The Method of the Study

The regression coefficient is applied to test the correlation between the elite officers and their GPA's in the academy, and the validity was tested by Pearson's r .

A. The Application of the regression coefficient

(1) Divide the elite officers into four groups according to their GPA's in the academy. Each group must have the same number of officers.

(2) Analyze the distribution of the "elite-ized" officers' GPA's in each group.

(3) The regression coefficient and correlation are shown in Figure 1-1.

In order to test the correlation, appoint D, C, B, and A to the points 1, 2, 3, and 4 on the X axis according to the elite officers' GPA's and the distribution of the elite officers will be placed on the Y axis. Then, the simple correlation of the two variables may be explained by $y = f(x)$. When they are placed on the graph and when it is assumed that the points in the scatter diagram (the correlation points) form a straight line, the regression coefficient $y = f(x)$ becomes $y = ax + b$. The values for 'a' and 'b' could be calculated by applying the least squaring rule. The values are as

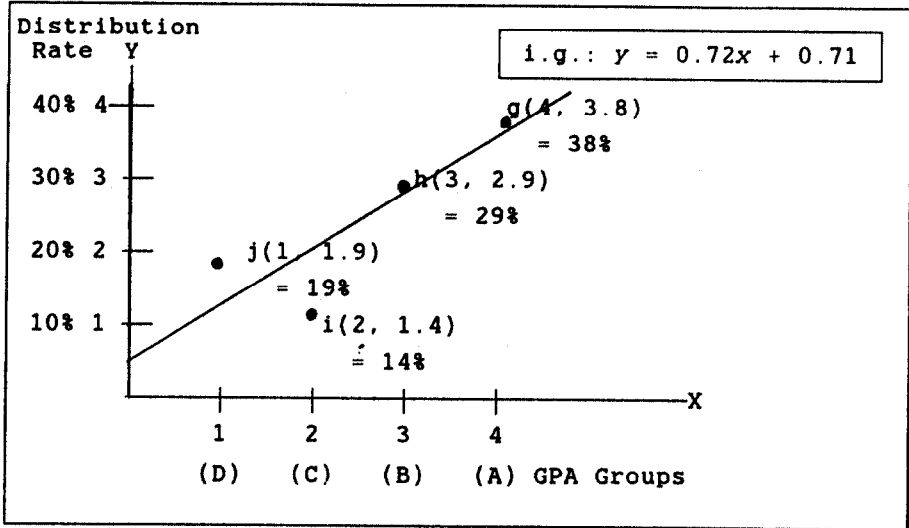


Figure 1-1.

follows:

$$a = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - (\sum x)^2}, \quad b = \frac{\sum y \sum x^2 - \sum x \sum xy}{n\sum x^2 - (\sum x)^2}$$

(‘n’ is the number of the points in the scatter diagram, and ‘n’ is 4 here.)

The value of ‘b’ does not have a significant meaning in the analysis of the correlation, but the value of ‘a,’ which is called a regression coefficient, becomes the index that shows the degree of the correlation between the elite officers and their GPA’s in the academy.

If, for example, the elite officers from the class 1960 are distributed in A, B, C, and D group with 38%, 29%, 14%, and 19% each, the numbers of the points in the scatter diagram (g, h, i, and j) and the regression line may be drawn as in Figure 1. And $y = f(x)$ becomes $y = 0.72x + 0.71$. ‘a,’ the value of incline shows 0.72.

In other words, in case of $a > 0$ (Figure 1-2, y_1), $y = f(x)$ is explained by the increasing function. Thus, it is a positive correlation, which means that there are many elite officers in the group of high GPA. And the greater the value of ‘a,’ the more elite officers are distributed in the group with high GPA. The case of $a = 0$ (Figure 1-2, y_2) means that the elite officers’ GPA distribution is equal in each group, and $a < 0$ (Figure 1-2, y_3), as the negative correlation, means that those who had lower GPA have been promoted faster than their classmates.

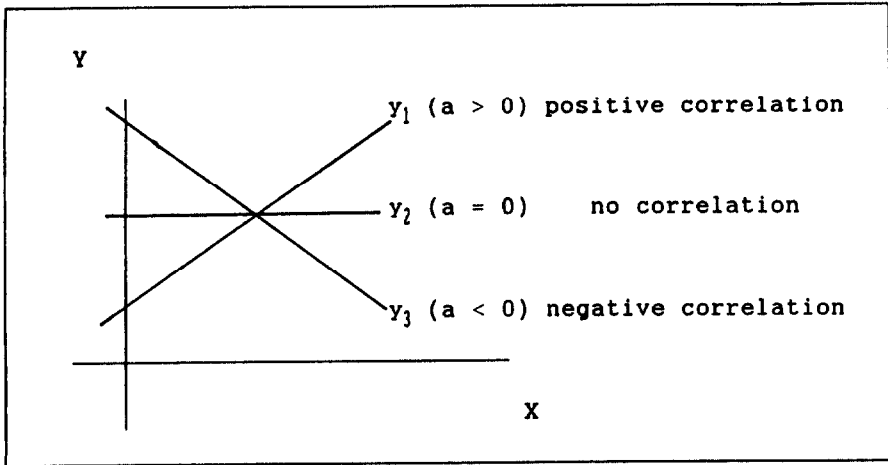


Figure 1-2.

(B) The Application of Pearson's r

According to the correlation coefficient, it is possible to explain that the correlation points were assumed to be a straight line of $y = ax + b$. Pearson's r is the most common way of measuring validity. The following is the value that shows how close the points in the scatter diagram are to the correlation line.

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{(\sum x^2 - \frac{(\sum x)^2}{n}) (\sum y^2 - \frac{(\sum y)^2}{n})}$$

In the formula, $r = 1$ means the points in the scatter diagram match the correlation line, and $r = 0$ means no correlation. In the meantime, as the value approaches closer to 1, it means that the points in the scatter diagram are closer to the correlation line.

II. Air Force Academy Education and the "Elite-ization" of the Air Force

The Nature and Curriculum of Air Force Academy Education

1. The Nature of Air Force Academy Education

The Air Force Academy, as an institute to train Air Force officers, has the mission of equipping the cadets with the knowledge and leadership needed by the junior

officers, providing them with the experience and motivation that will become the foundation of their on the job performance as Air Force commanders and producing elite Air Force officers.

2. Curriculum

The Air Force Academy has trained its cadets since it was organized originally as the Army Aviation Academy. With independence from the Army in 1949, the name was changed to the Air Force Academy, which is still in use today.

The Air Force Academy currently provides various classes such as Foreign Languages, International Relationship, Management, Computer Science, Industrial Engineering, Aviation Engineering, Mechanical Engineering and Electronic Engineering.

3. The Assessment of GPA

Regarding the assessment of GPA, the Air Force Academy is different from other colleges/universities in that it takes the cadets' Military Bearing Evaluation into consideration. The Military Bearing Evaluation means the score calculated according to the standards on the cadets' military bearing in their campus life after normal duty hours, which is done on the bases of objective and reasonable observation.

The cadets are encouraged to acquire excellent leadership, respect for law, and military bearing, through forcing them to live in a strictly controlled environment for four years. According to the evaluation policy before 1960, a maximum of 1,000 points could be earned each semester; 880 points in the academic area and 120 points in the military bearing area. Since 1960, the credit system was adopted and the importance of the Military Bearing Evaluation was significantly increased. Now a cadet may earn up to 1,000 points; 75% in the academic area and 25% in the military bearing area.

The "Elite-ization" of the Air Force

1. The Correlation Between the Generals and GPA

<Table 2-1> shows the percentage of the promotion of the academy graduates to general up to December 1992. 15.1% of the graduates of classes 53 to 70 were promoted to general.

(The average shown in the table is different from the arithmetical average of the Promotion Percentages in the table, for it is the total Promotion Percentage of all classes. This principle is applied to all of the following tables.)

The distribution of the generals according to their GPA groups is shown in <Table

<Table 2-1> The Percentage of Promotion to General

Class	Promotion Percentage	Class	Promotion Percentage
Class '53	30.1	Class '63	13.4
Class '54	17.7	Class '64	16.4
Class '55	15.4	Class '65	22.6
Class '56	13.7	Class '66	16.7
Class '57	11.3	Class '67	14.5
Class '58	15.8	Class '68	14.1
Class '59	10.8	Class '69	14.5
Class '60	10.5	Class '70	7.4
Class '61	16.9		
Class '62	15.9	Average	15.1

<Table 2-2> The Percentages of the Distribution of Generals According to their GPA Groups

Class\GPA group	A	B	C	D
Class '53	44.0	28.0	24.0	4.0
Class '54	56.0	24.0	8.0	12.0
Class '55	38.1	28.6	14.3	19.0
Class '56	35.7	28.6	21.4	14.3
Class '57	38.8	33.3	11.3	16.6
Class '58	41.6	25.0	8.3	25.1
Class '59	60.0	20.0	10.0	10.0
Class '60	43.1	14.2	28.5	14.2
Class '61	36.3	18.1	27.2	18.4
Class '62	30.0	40.0	10.0	20.0
Class '63	33.4	22.2	22.2	22.2
Class '64	40.0	40.0	20.0	0.0
Class '65	21.4	21.4	42.8	14.4
Class '66	50.0	20.0	20.0	10.0
Class '67	50.0	12.5	37.5	0.0
Class '68	55.5	11.1	33.4	0.0
Class '69	27.2	45.4	9.3	18.1
Class '70	50.0	33.4	16.6	0.0
Average	41.7	26.6	19.1	12.6

2-2> <Table 2-3> reveals the result of their correlation analysis.

<Table 2-3> Correlation Between Promotion to General and Academy GPA

Class	Regression Value(α)	Correlation Value(r)
Class '53	1.24	.973
Class '54	1.48	.878
Class '55	0.72	.875
Class '56	0.71	.999
Class '57	0.89	.871
Class '58	0.66	.629
Class '59	1.60	.868
Class '60	0.72	.676
Class '61	0.45	.667
Class '62	0.60	.600
Class '63	0.34	.775
Class '64	1.40	.944
Class '65	0.00	.000
Class '66	1.20	.894
Class '67	1.25	.707
Class '68	1.44	.756
Class '69	0.63	.530
Class '70	1.67	.999
Average	0.95	.978

3. The Correlation Between Colonels and GPA

This research and analysis is done on the Air Force colonels from the classes 70 through 75 also. They were categorized into pilots and non-pilots. In case of the pilots, the average of 27.4% of the classes were promoted to the colonel, but only about 20.7% of the classes who were promoted in the first term selection were considered to be elites. All non-pilot colonels which is about 16.5% of the classes are considered as elites (Refer to <Table 2-4>).

The result of the research on the distribution of the elite colonels according to academy GPA is shown in <Table 2-5>.

While 64% of the elite colonels among pilots are distributed in the upper level (Group A: 38.4%, Group B: 25.6%), the non-pilot counterparts are distributed in each group evenly.

The regression correlation test on the research shows that the correlation value of the pilots is very high (0.89) as shown in <Table 2-6>. On the other hand, the non-pilots show no relation with their GPA's.

<Table 2-4> Promotion to colonel and Selection of Elites

Class	Pilots		Non-pilots Pro. Term & Rate = Select. of Elite
	Pro. Term & Rate	Select. of Elite	
70	1st-4th (32.1%)	16.0%	3rd-4th (13.6%)
71	1st-2nd (31.5%)	20.2%	3rd-5th (13.5%)
72	1st-3rd (29.9%)	21.5%	3rd-4th (15.9%)
73	1st-2nd (35.3%)	23.5%	3rd-4th (11.8%)
74	1st-2nd (26.5%)	18.6%	3rd term(11.5%)
75	1st term(23.4%)	23.4%	—
Ave.	27.4%	20.7%	16.5%

<Table 2-5> The Distribution of the Elite Colonels According to their GPA's (%)

Class	Category GPA Group	Pilots				Non-pilots			
		A	B	C	D	A	B	C	D
70		61.5	23.1	15.4	0.0	27.3	18.2	36.3	18.2
71		44.4	16.7	38.9	0.0	25.1	25.0	25.0	24.9
72		34.8	21.7	34.8	8.7	30.8	23.1	30.7	15.4
73		41.7	33.3	12.5	12.5	26.3	15.8	21.1	36.8
74		42.9	33.3	14.3	9.5	7.7	38.5	23.1	30.7
75		19.2	23.1	46.2	11.5	—	—	—	—
Average		38.4	25.6	28.0	8.0	24.7	23.5	27.2	24.6

<Table 2-6> Correlation Between Elite Colonels and Academy GPA

Class	Pilots		Non-pilots	
	Regression Value (a)	Correlation Value (r)	Regression Value (a)	Correlation Value (r)
70	1.92	0.95	0.09	0.14
71	1.11	0.70	0.01	0.95
72	0.65	0.67	0.39	0.68
73	1.08	0.94	0.37	0.53
74	1.19	0.98	-0.54	0.53
75	0.00	0.00	—	—
Average	0.89	0.98	-0.03	0.28

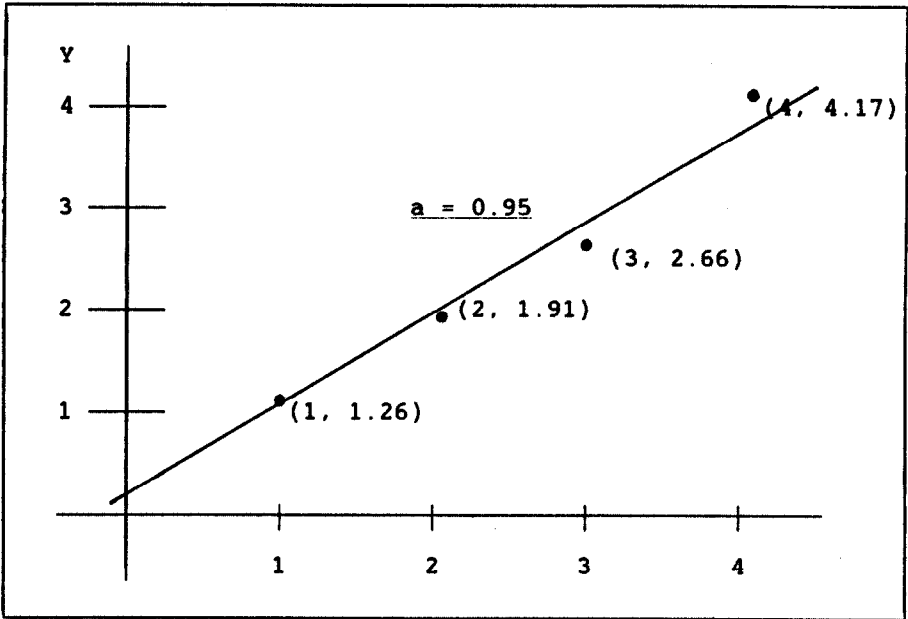


Figure 2-1.

General Analysis

According to this study, it is proven that the Air Force "elite-ization" and the Academy GPA are highly correlated. Its correlation points and regression line are shown in Figure 2-1.

As the reader finds in Tables 2-2 and 2-3, 41.7% of the generals from classes 53 to 70 are in the GPA group A of the best GPA's in the academy. The percentage of the generals decreases as it moves to the poor GPA groups: Group B has 26.6% of the generals; C, 19.1%; and D, 12.6%, which shows that there is significant correlation between them. And the validity of correlation analysis is satisfactorily proven by the high correlation value on the correlation line.

Considering the upper level groups of GPA (Groups A and B), Class 70 shows the highest distribution rate of 84.4%, whose correlation value was also the highest of 1.67, and Class 65 shows the lowest of 42.8%, whose correlation value was 0. Class 65 was the only class that shows no relation between promotion and GPA. Figure 2-2 shows the distribution of the upper level groups of the whole eighteen classes.

Observing correlation values (a) of the eighteen classes seven classes have 1.2 in correlation value, and there are eight classes with the correlation values higher than 0.6. The correlation value 0.6 means that the number of elite officers with GPA in the

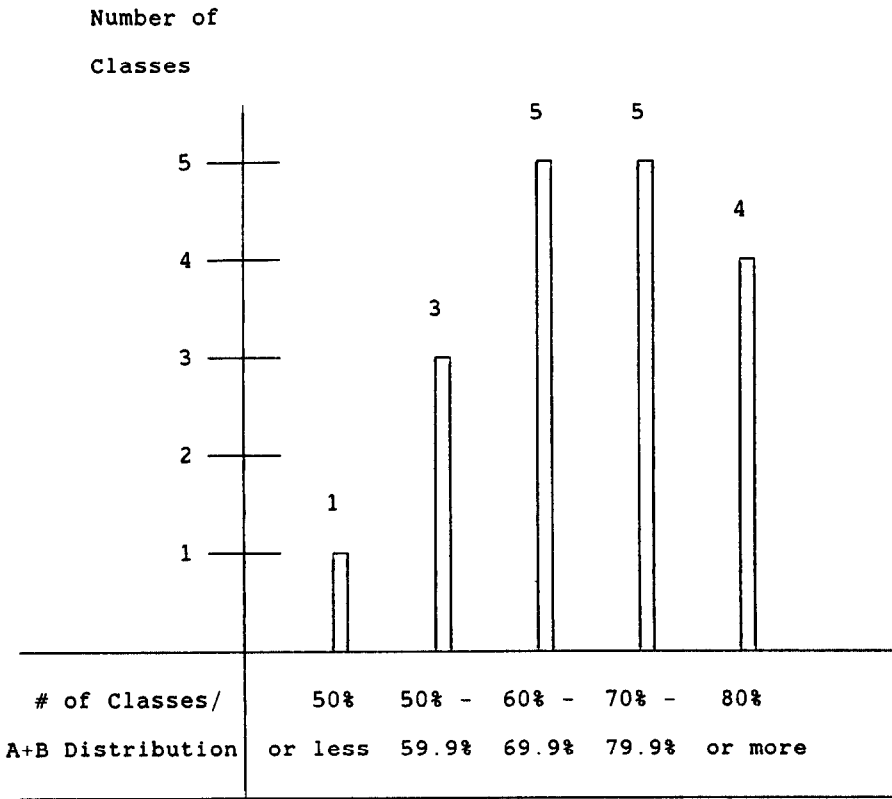


Figure 2-2.

upper level is greater by about two times than those in the lower level (approximately 70:30 in ratio). Therefore, it could be concluded that the generals' academy GPA's were very good overall.

Correlation Value (a)	less than 0.3	0.3—less than 0.6	0.6—less than 1.2	more than 1.2
Number of Classes	1	2	8	7

III. Conclusion

The military is the representative of goal-oriented organizations, and the nature of military education is considered to be a means to accomplish the mission. In order

to execute the mission operation more efficiently and advantageously, therefore, education with higher quality is needed.

The Air Force Academy was established to cultivate the leaders needed in the Air Force, in which all cadets, as they live together on campus for four years, undergo strict training to be equipped with knowledge and leadership skills necessary to the Air Force officers. The cadets' life on campus is their initial as well as most important experience in the military. Even after graduation, they strive through continuing education to improve their cognitive skills to use extremely sophisticated weaponry systems and continue military life with the emphasis on the effective management of violence which is the basic function of the military.

They can be promoted without a special, competitive selection process as their years in service go by after being commissioned as the second lieutenant on graduation from the academy. After being field grade officers, however, they become "elite-ized" through the competitive promotion and elimination process. The class 70 through the "elite-ization" process produced generals for the first time in 1993 after 27 years since being enrolled in the academy 1966. Approximately 15% of classes 52 to 70 became generals through the "elite-ization" process.

The cadets' GPA in the academy does not bear any influence on this evaluation process. The research on correlation between the "elite-ized" officers and their GPA in the academy, however, shows an unexpected result of high correlation between those variables. In order to analyze this correlation more scientifically, the test of regression correlation has been applied. The result can be concluded as the following:

1. The elite officers have significant positive correlation with their academy GPA's.
2. The correlation value becomes higher as the rank of the elite officers goes up.
3. The pilots have higher correlation value than the non-pilots.

Summary according to the levels of "elite-ization"

Level	Regression Value	Correlation Value
Lt. Col. → Col.	Pilots	0.89
	Non-pilots	-0.03
Col. → General	Combined	0.95

Also, the reliability on the validity and result of the regression correlation test was very high, except for the case of the non-pilots. Considering this result, the academy GPA of the Air Force officers who are in charge of the important mission of the national defense was generally excellent, and the high correlation affirms the impor-

tance of education in the Air Force Academy.

Finally, the result of this study suggests that the following areas should be studied further:

1. Duplicate and comparative studies on the Military Academy and the Navy Academy graduates should be done.
2. Correlation analyses in separate grade areas, such as the Military Bearing Evaluation and the academic performance area, should be done.
3. The reason for high correlation should be studied more in depth.