PERFORMANCE PREDICTORS AMONG UNDERGRADUATE BUSINESS STUDENTS

By
EMMANUEL T. VELASCO*

Introduction

Colleges and universities, like any other organization, are faced with the problem of allocating a given amount of resources among competing activities. One facet of such a problem is the determination of the size of enrolment and the delineation of the criteria to be used in the selection of students. My paper is concerned with this topic with specific reference to the College of Business Administration, University of the Philippines.

The admission of students into the undergraduate program of the College of Business Administration is unique in that its students spend their first two years in another unit of the University – the College of Arts and Sciences.[1] These pre-business students, as they are referred to, are not automatically admitted into the College in their third year. Only those meeting a minimum weighted grade average in their pre-business courses are allowed to enter the College. It may seem then that the admission procedure is simple because the grades received by these students in their pre-business courses are relatively homogeneous, less subject to error, and hence, better predictors of performance in their third and fourth years. Consider the tremendous admission problem faced by most business schools and colleges when they have to reckon with high-school grade average, since they admit students in their freshman year. It is well recognized that there is a wide range in the quality of the products from different high schools, particularly in populous high schools. This problem of rating high schools all over the Philippines for purposes of admitting students into the college level is now receiving attention in the Funds for the Assistance to Private Education (FAPE)-supported College Entrance Tests (CET)[2] and a pending House of Representatives bill that proposes to require a national examination for all high school seniors planning to do collegiate work.

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Computations were done in the University's Computer Center. The opinions expressed in this paper are those of the author. The usual disclaimer is in order.

[1] This is a common practice among the other units of the University, which stems from the use of a common General Education Curriculum in the first two years.

[2] The technique accepted for this problem is cluster analysis. Of course, large schools and universities getting students from a wide range of high schools can do a better job of clustering.

The sole reliance on the weighted grade averages in the first and second years have been questioned a number of times by the faculty of the College of Business Administration. First of all, the business related courses taken with the College of Arts and Sciences are at most two three-unit courses in Accounting and a three-unit course in Economics. Moreover, it is felt that there are certain personality traits quite apart from intelligence, closely related to success in business.[3] Accordingly, a study was conducted on a combination of weighted averages, intelligence and personality test scores to establish their predictive validity. In the case of other business schools and colleges, it may be argued that even if a good clustering of high schools is found, nevertheless, there remains the problem of ferreting out good business students from an acceptable group of high-school graduates. In other words a predictive validation study on high-school grades and some personality factors should be undertaken.

To digress a little, personality tests rely a great deal on the integrity of the respondents and, as Whyte suggested in *The Organization Man* [10], it may lead to one giving the sought for responses. However, Whyte was concerned about the frequent usage of such a test in large corporations in the United States to the point that a junior executive aspirant may take a dozen or so of such personality tests and hence, form impressions of what are the expected responses. To a large extent, however, personality tests given to an undergraduate is his first exposure to such a test. This minimizes the opportunity to fake responses.

The Test

After discussion with a colleague, Prof. R. de la Paz, on certain available personality test pertaining to business and a subsequent consultation with the Testing and Counseling Center of the University, a set of five tests was selected. They are the following:

1. SUBSUMED ABILITY TEST (SAT)

This is a measure of learning efficiency. It is designed to determine if an individual is able and willing to learn or use a previously learned written language, system of mathematics, coding system, or otherwise visual symbol system. It attempts to gauge the recognition, abstraction, and conceptualization skills of an individual. The test itself is composed of two scores: The Demonstrated Abilities Score (DAS) and the Potential Abilities Score (PAS) [8].

SAT is the only intelligence test in the set. It was included specifically with the case method in mind, i.e. the recognition, abstraction, and conceptualization skills

[3] In a study of 428 pre-1944 MBA graduates of Stanford, Porter [7] did not find any significant correlation (at the 5% level) between intelligence test score and six measures of executive success. Livingston [6] also decries the absence of a direct relationship between performance in school or training program and record of success in management.

were deemed quite necessary in tackling case materials. The business students at the University of the Philippines handle cases starting in their junior year. The number of cases they discuss depends on their major field, e.g., marketing majors discuss more cases than the accounting majors.

2. BUSINESS JUDGMENT TEST (BJ)

This test is an attempt to construct a form that will more adequately measure social intelligence rather than abstract or mechanical intelligence. Its content is geared specifically to business situations. As such it is designed to be a measure of empathy or "feel" for the generally accepted ideas and opinions on desirable courses of action in interpersonal relationships [1].

3. GORDON PERSONAL INVENTORY (GPI)

There are four traits included in this inventory:

a) cautiousness (CA) – a measure of risk-taking behavior and impulsiveness.

b) original thinking (O) – a measure of a person's ability to work with ideas and difficult problems, i.e., his intellectual and creative activity.

c) personal relations (PR) – a measure of an individual's faith, trust, tolerance, and understanding of people.

d) vigor (V) – a measure of an individual's vigor and energy level. [2].

4. GORDON PERSONAL PROFILE (GPP)

Like the GPI, there are also four traits in this test:

a) ascendancy (A) – a measure of self-assurance, activeness, and assertiveness in group relationships.

b) responsibility (Res) – a measure of determination and perseverance, as well as the taking of responsibilities seriously.

c) emotional stability (ES) – a measure of balance and emotional stability, sensitivity, as well as freedom from anxiety and nervous tensions.

d) sociability (So) – a measure of gregariousness; the extent of liking to be with and working with people (social interest). [3].

5. SURVEY OF INTERPERSONAL VALUES (SIV)

This test was included because it claims to measure six critical values involving the individual's personal, social and occupational adjustment. [4].

a) support (Su) – being treated with understanding, receiving encouragement from other people, and being treated with kindness and consideration;

b) conformity (Co) – doing what is socially correct, following regulations closely, doing what is accepted and proper, and being a conformist;

c) recognition (Rec) – being looked up to and admired, being considered important, attracting favorable notice, and achieving recognition.

d) independence (I) – having the right to do whatever one wants to do, being free to make one's own decisions, and being able to do things in one's own way.

e) benevolence (B) – doing things for other people, sharing with others, helping the unfortunate, and being generous;

f) leadership (L) – being in charge of other people, having authority over others, and being in a position of leadership or power.

The tests were administered to the seniors and juniors of the College as well as to the applicants for admission, i.e., the sophomores, toward the end of the second semester, 1966-67. Two more examinations were conducted for the applicants toward the end of the first and second semesters, 1967-68. Those who took the test were subsequently classified into:

Code – 1, Seniors, 1966-67
Code – 2, Juniors, 1966-67
Code – 3, Admitted, First Semester, 1967-68
Code – 4, Admitted, Second Semester, 1967-68
Code – 5, Admitted, First Semester, 1968-69
Code – 6, Not admitted.

The Means and Standard Deviations

The means and standard deviations for the seventeen test scores, with a breakdown as to sex, are given in Table 1.

The male-female mean difference in these scores that are significant at the 1% level in favor of the males are:

1. Cautiousness
2. Original thinking
3. Vigor
4. Ascendancy

5. Emotional stability[4]
6. Independence[4]
7. Leadership

Females on the other hand scored significantly higher in:

1. Support
2. Conformity
3. Recognition[4]

Table 1
Means and Standard Deviations of Test Scores

	Total (N = 744)		Males (N = 268)		Females (N = 506)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
DAS	52.71	5.58	52.46	5.99	52.85	5.33
PAS	54.41	4.02	54.12	4.53	54.56	3.71
Business Judgment	52.77	6.13	53.11	5.94	52.59	6.21
Cautiousness	24.63	5.64	25.47	5.07	24.18	5.88
Original Thinking	24.54	5.78	25.94	5.54	23.80	5.77
Personal Relations	23.71	5.24	24.19	4.67	23.46	5.51
Vigor	24.39	5.63	25.15	5.34	23.98	5.73
Ascendancy	21.80	5.74	23.19	5.28	21.06	5.83
Responsibility	24.29	5.74	24.36	5.54	24.26	5.84
Emotional Stability	22.52	5.84	23.18	5.82	22.17	5.83
Sociability	22.00	6.11	21.85	6.14	22.09	6.09
Support	12.53	5.57	11.04	5.92	13.31	5.21
Conformity	21.58	6.78	20.25	6.79	22.28	6.66
Recognition	8.34	5.67	7.78	4.96	8.64	6.00
Independence	16.16	6.71	17.02	6.84	15.90	6.60
Benevolence	15.95	6.04	15.68	7.21	16.09	5.32
Leadership	17.34	7.84	20.06	8.37	15.89	7.15

Appendix A contains a comparison of the means and standard deviations of the University of the Philippines sample with selected samples of college students in the United States.

[4]These scales were no longer significantly different when dealing with the males and females of those who took the tests as sophomores (codes 3 to 6).

Comparing the test scores of those who took the tests as sophomores (codes 3 to 6), one finds that:

a) those who were not admitted (code 6) scored higher in:

i) Original thinking (8% level),
ii) Personal relations (4% level), and
iii) Benevolence (6% level),
but lower in:
i) DAS (4% level),
ii) PAS (8% level),
iii) Support (<1% level) and
iv) Recognition (3% level)

b) males who were not admitted scored significantly higher in independence (1.5% level), but lower in DAS (4% level), PAS (3% level), and recognition (<1% level) than the admitted males.

c) females who were not admitted scored significantly higher in conformity (3% level) and lower in support (3% level) than the women admitted to the College.

d) the men who were not admitted scored higher in:

i) Ascendancy (<1% level),
ii) Independence (5% level), and
iii) Leadership (<1% level)
and lower in:
i) PAS (5% level),
ii) Support (5% level),
iii) Conformity (<1% level), and
iv) Recognition (2% level)

than the women not admitted.

The Results of the Factor Analysis

It is cumbersome to deal with seventeen test scores together with other variables in a validation study. The usual procedure is to factor analyze these test scores to determine if they can be reduced to a few manageable dimensions.[5]

The first step in factor analysis dealing with normalized variables is to compute the intercorrelation matrix.

[5] One of the standard references is Harman [5].

There are a number of possible solutions to an orthogonal factor model depending on the method used. In practice, the Principal Axis Method is most often adopted since it yields a unique solution. In essence, what it does is to solve for the latent roots or eigenvalues of the correlation matrix. The factoring is stopped after the last factor extracted is less than the specified eigenvalues (here set to 1.0). As a final step, the factors are rotated. There are two ways of doing the rotation: orthogonal or oblique. However, only an orthogonal rotation was considered, since an oblique rotation can be done a number of ways and one that then requires the informed judgment of the makers of the tests. The usual method of doing orthogonal rotations is the Varimax method.

Four factors were extracted from the seventeen test scores and they account for about 44% of the total variance of these variables. The rotated factor matrix is given in Appendix B.

In deriving the independent variables of a regression analysis from these factors, the following procedure was adopted:

1) Only those variables (test) with factor loadings of .10 or higher were included. As a result, the Business Judgment Test was excluded.

2) The remaining variables were assigned to one and only one factor on the basis of the magnitude of the factor loading.

3) The weights assigned to the variables in a factor were computed from the formula $w_i = a_i/\Sigma|a_i|$ where a_i is the factor loading of variable i.

The results are as follows:

Factor 1 = .176 cautiousness + .136 personal relations + .262 responsibility + .223 emotional stability − .089 support −.060 recognition + .054 benevolence.

Factor 2 = .501 DAS + .499 PAS.

Factor 3 = .150 original thinking − .158 vigor +.314 ascendancy + .270 sociability + .108 leadership.

Factor 4 = −.508 conformity + .492 independence.

Looking at the mean difference of these factors one finds:

1. Males score significantly higher (at the 1% level) in factors 1, 3, and 4 than the females in the overall sample [N = 628].

2. Males score significantly higher (at the 1% level) in factor 3 than the females in the group who took the tests as sophomores (codes 3 to 5).

3. There is a tendency for those admitted in later years (Codes 3, 4, and 5) to score higher in factor 4, i.e., to be more independent, which is all the more surprising since they tend to be younger as a group.

The Regression Results

Based on a sample of the graduates of 1966-67 to 1970-71, regressions were run using the weighted average from the first to the fourth year (WA1-4) as the dependent variable[6] and the following independent variables:

1) WA1–2 – the weighted average in the pre-business courses;

2) Factor 1 – cautiousness, personal relations, responsibility, emotional stability, support recognition, benevolence;

3) Factor 2 – the demonstrated ability score and potential ability score;

4) Factor 3 – original thinking, vigor, ascendancy, sociability, and leadership;

5) Factor 4 – conformity and independence;

6) Age on admission;

7) Sex (Coded: females = 0, Males = 1);

8) Major field (Coded: Accounting = 1, Economics = 2, Finance = 3, Management = 4, Marketing = 5);

9) Year of graduation (Coded: 1966-67 = 1, 1967-68 = 2, 1968-69 = 3, 1969-70 = 4, 1970-71 = 5).

[6] For those not familiar with the U.P. grading system, 1.00 is excellent, 1.50 very good, 2.00 good, 2.50 satisfactory, 3.00 passing, 4.00 conditional failure and 5.00 failure. As of 1967-68 the College of Business Administration faculty selected an option to give quarter grade points only, i.e., 1.00, 1.25, 1.50, 1.75, etc. Hence, the results that follow should be considered with caution inasmuch as some of the students included in this study were affected by this modification in the grading system.

The following results are based on a stepwise multiple regression computer program. The number of variable entered is determined by the attainment of the maximum R^2, adjusted for degrees of freedom. The *t* values are reported under the coefficients.[7]

(1.0) WA1-4 = .501 + .771 WA1-2 − .008 Major field − .027 Sex
[N = 628] (+37.36) (-2.31) (-2.23)

+ .003 Factor 1 + .007 Year of graduation $R^2 = .71$
(2.07) (1.42)

(1.1) WA1-4 = .096 + .876 WA1-2 − .100 Sex + .074 Year of graduation
[N = 126] (17.74) (3.61) (3.20)

−.020 Major field + .003 Factor 4 + .003 Factor 2
(2.53) (1.45) (1.39) $R^2 = .76$

(1.2) WA1-4 = .591 + .665 WA1-2 + .096 Year of graduation
[N = 159] (15.21) (5.34)

−.003 Factor 4 $R^2 = .62$
(-1.41)

(1.3) WA1-4 = .432 + .752 WA1-2 + .047 Year of graduation
[N = 162] (20.10) (2.04) $R^2 = .76$

(1.4) WA1-4 = −.325 + .750 WA1-2 + .050 Age − .063 Sex
[N = 39] (10.21) (2.58) (-1.63)

−.044 Factor 4
(-1.14) $R^2 = .74$

Equation (1.0) is the overall regression equation. Equations (1.1) to (1.5) refer to the seniors and juniors of 1966-67, to the new students of the first and second semesters, 1967-68, and the first semester, 1968-69, respectively. Equation (1.6) is based on the combined group of new students. The weighted average on admission,

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[7]Other schools who admitted their students as freshmen may be interested in a regression of WA1-4 on the factored test scores only, i.e.,

WA1-4 = 2.792 − .007 Factor 2 − .005 Factor 4 $R^2 = .03$
[N = 628] (-3.25) (-2.85)

As expected, factor 2, which is the Subsumed Ability Test, (SAT = DAS +PAS), entered the regression since it is really an intelligence test. Moreover, being less of a conformist – being more independent (factor 4) appears to be a trait of a good business student. However, note the low explanatory power of these variables.

WA1-2, is consistently the best predictor of WA1-4. This result can be expected because the courses included in the computation of WA1-2 are also included in the computation of WA1-4. However, their correlation coefficient is .83 only which means that there is a possibility for one to improve or lower his WA1-4 on the basis of his performance in business courses. The next section will consider the results of regression runs using WA 3-4 as the dependent variable.

(1.5) WA1-4 = .937 + .731 WA1-2 − .049 Sex − .012 Major field
[N = 142] (19.04) (-1.85) (-1.80)

−.005 Factor 2 $R^2 = .74$
(-1.49)

(1.6) WA1-4 = .263 + .756 WA1-2 + .016 Age − .008 Major field
[N = 348] (30.85) (2.59) (-1.95)

−.034 Sex + .003 Factor 1 $R^2 = .74$
(2.16) (1.57)

The regression coefficient for the major field is negative in the overall equation with a *t* value of −2.81, which says that management and marketing majors (codes = 4 and 5) improve on their admission average more than accounting majors (code = 1). Some may argue that this result is biased because the BSBA Economics Program (Major field code = 2) was phased out starting in 1968-69.[8] Looking at the individual equations, however, we find that this coefficient is still negative in equation (1.1), which is based on a group not affected by the abolition of the B.S.B.A. Economics Program. Nevertheless, there is the possibility that this variable is picking up the effect of the changing composition of the students of the college[9] in such a way that perhaps the magnitude of its coefficients should be smaller.

Sex is a good predictor of WA1-4 as indicated by equation (1.0). Its coefficient carries a negative sign which says that *males improve on their admission average* in general. This negative coefficient for sex also appears in equations (1.1), (1.4), (1.5), and (1.6) which indicates that it is a reliable predictor of WA1-4.

Only Factor 1 among the four factors of the test scores entered in the overall regression. It carries a positive coefficient which means that one who scores lower in this factor improves his admission average in general. This variable subsequently

[8] Economics majors constituted 12% of the enrolment of the College in 1966-67, 11% in 1967-68, 7% in 1968-69 and only 1% in 1969-70.

[9] Accounting majors constituted 50% of the enrolment in 1966-67 whereas management and marketing majors were only 28% of the students; but by 1969-70, the management and marketing majors accounted for 49% of the students, while accounting majors made up only 34% of the enrolment.

entered in equation (1.6) only with a positive sign still, but the *t* value indicates that the coefficient is no longer significant.

Factors 2 and 4, but not 3, appear in the individual regressions although their coefficients are not significant and their signs inconsistent, i.e., positive in one equation and negative in the other equations.

Although year of graduation entered in the overall regression, its coefficient is not significant. However, looking at the individual equations, we find that this variable has a positive and significant coefficient in equations (1.1), (1.2), and (1.3). This result should be expected inasmuch as it says that the laggards, i.e., those who overstay in the College, do poorer in their WA1-4 given their WA1-2. Moreover, these laggards have been included in the groups pertaining to equations (1.1), (1.2), and (1.3), more so than equations (1.4) and (1.5), where such laggards are still being processed, so to speak.

Regression Results: WA3-4 As Dependent Variable

Since the result of regressing WA1-4 is not free from estimation bias, the study was extended using the weighted average in the third and fourth years as the dependent variable (WA3-4). However, only two groups were covered—a sample of the graduates of 1966-67 and a sample of the graduates of 1970-71. Moreover in the later group, weighted averages in English, Mathematics, Accounting, and Economics courses taken in the first two years were considered as possible predictors other than just the admission average.

Consider first the graduates of 1966-67.[10]

(2.0) WA3-4 = .703 + .689 WA1-2 −.201 Sex − .026 Major field
[N = 92] (8.42) (-3.79) (-1.72)

−.004 age + .009 Factor 1 + .006 Factor 4
(−1.76) (1.58) (1.50) R^2 = .48

Compared to the regression using WA1-4 as dependent variable we now find a lower R^2 adjusted for degrees of freedom. Among the variables that appear in this regression, we find WA1-2 as still the best predictor of performance. Sex is a good predictor of WA3-4 as it was of WA1-4. It carries a negative sign, quite consistent

[10]For purposes of comparison with earlier results such as equations (1.0) and (1.1), the regression using WA1-4 as dependent variable on the graduates of 1966-67 is as follows:

WA1-4 = .352 + .859 WA1-2 − .124 sex − .013 Major field − .003 Age + .004 Factor 1
(15.77) (-3.70) (-1.29) (-1.52) (1.18)

+.004 Factor 4
(1.38) R^2 = .74

with an earlier finding that males make better business students. The coefficient for the major field is no longer significant here, but the negative sign is consistent with previous results. Lastly, as we noted before, the factored test score do not seem to add any significant predictive power when considered with WA1-2 especially:

For the graduates of 1970-71, consider the following regressions:[11]

(3.0) WA3-4 = .700 + .674 WA1-2 − .036 Major field + .054 Age − .008 Factor 2
(11.51) (-3.67) (2.31) (-2.11)

−.071 Sex
(-2.00) $R^2 = .45$

(3.1) WA3-4 = .677 + .115 WA Economics + .135 WA Mathematics
(3.78) (4.58)

+ .188 WA English + .133 WA Accounting − .030 Major field
(4.46) (3.93) (3.01)

− .007 Factor 3 + .030 Age
(-1.98) (1.94) $R^2 = .42$

(3.2) WA3-4 = .815 + .534 WA1-2 − .038 Major field + .094 WA Accounting
(7.76) (-2.83) (2.83)

+ .054 WA Economics − .005 Factor 3 + .020 Age
(1.74) (-1.47) (1.38)

− .004 Factor 2
(-1.11) $R^2 = .48$

It seems that WA1-2 is a better predictor of WA3-4 than a combination of the weighted average in Economics, Mathematics, English, and Accounting as indicated by the higher R^2 adjusted for degrees of freedom in equation (3.0). On the other hand, equation (3.2) suggests that it may be worthwhile to look at the Accounting and Economics grades separately from WA1-2 in projecting the performance of an applicant in business courses.

Major field, as a variable, entered in all these equations each time with a significantly negative coefficient. Relatively speaking, why should management and marketing majors perform better in the College than the accounting majors? The argument that this is partly due to a changing composition in the student body as

[11] The same variable entered in regressions with WA1-4 as dependent variable; see equations (3.0), (3.1), and (3.2).

far as their major field is concerned cannot be denied. However, we are dealing only with the graduates of one year, such that factors other than changes in distribution of student in their major field should be examined. Could this be the effect of Management and Marketing majors taking more courses which use the case method? Or could it be that management and marketing professors are more lax in giving grades? Could it be that in using the case method in management and marketing courses, the professors find it more difficult to differentiate among his students? Or could it be a fundamental difference in these major fields such that Accounting and Economics courses may be classified as more "quantitative", while Management and Marketing courses as more "qualitative"? Unfortunately, this study is not designed to come up with the answers to these questions. It is sufficient though that we have established the fact that the area of concentration intended by an applicant to the College is an important predictive variable of his success in it.

Age upon admission entered in all these equations with a *positive* coefficient significant in equation (3.0), almost significant in (3.1), and not significant in (3.2). It implies that younger students tend to do better in the College, all other factors equal. Comparing this result with equation (2.0), one finds a *negative* but insignificant coefficient in the sample of the graduates of 1966-67. It seems that this may be due to the fact that the graduates of 1966-67 are significantly older (at the 3% level) than those of the graduates of 1970-71. In any event one can perhaps say that age is not a good indicator of an undergraduate student's maturity.

Sex as a variable was entered only in equation (3.0) but the sign of its coefficient is significantly negative, and hence, reinforces earlier findings.

Factor 2 entered in equation (3.0) with a significantly negative coefficient, while factor 3 entered in equation (3.1) with a significantly negative coefficient also. Both factors appear in equation (3.2) with negative signs, but their coefficients are no longer significant.

Concluding Remarks

Performance in business courses taken in the third and fourth year is best predicted by a student's performance in pre-business courses. This seems reasonable inasmuch as grades earned in these courses embody not only a person's intelligence, but more so his perseverance and diligence in satisfying a number of requirements imposed by the subject matter as well as by the teacher.

The sex and the intended major field of an applicant have some contributory power of prediction. Males do better in a business school than females. This is hardly earthshaking since the business world is traditionally a man's domain. Also, students who major in management-oriented courses tend to do better in their

courses than those who specialize in technical areas such as accounting. It should be noted however that our students have been pre-screened by the admission average requirement, except for a few special students. In other words, they have at least the necessary communication skills important in tackling case materials.

Personality tests selected from American sources do not have any significant power as far as student performance is concerned when taken together with other predictors. Perhaps instead of accepting the content validity of these tests one should design a test that would allow for the cultural peculiarities of the Filipino student.

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Appendix A

A COMPARISON OF MEANS AND STANDARD DEVIATIONS

The following is a comparison of the means and standard deviations of the seventeen traits between the University of the Philippines, College of Business Administration sample and selected samples of college students in American universities.

1. Sanders [8] reports a mean DAS of 52.50 and standard deviation of 8.71 for 193 college students. The mean DAS for University of the Philippines business students is slightly higher for females (52.85) and lower for males (52.46). The standard deviation is lower for both the male and female University of the Philippines student (5.99 and 5.33 respectively), a difference that cannot be due entirely to the difference in the size of the samples.

2. Bruce [1] reports a mean of 59.33 with S.D of 5.61 on the *Business Judgment Test* for a general population [N = 3,225], while Watley and Martin [9] cite a mean of 53.76 and S.D of 6.39 in their sample of 63 female college students. Business students at the University of the Philippines score lower in this test (52.77 for both men and women and 53.11 and 52.59 for the men and women, respectively).

3. Gordon [2] gives the following means and standard deviations on the GPI for 2,017 college men and 871 college women.

	MEN		WOMEN	
	Mean	S.D.	Mean	S.D.
Cautiousness	22.9	6.6	23.1	6.6
Original Thinking	25.3	5.6	24.1	6.0
Personal Relations	23.0	5.9	23.9	6.1
Vigor	24.0	5.9	23.1	6.1

University of the Philippines men score higher in these traits, but the women score higher only in cautiousness and vigor than their respective counterparts. What is most noticeable is the lower standard deviations of the University of the Philippines sample (see Table 1).

4. For 4,211 male and 1,106 female college students, Gordon [3] gives the following on the GPP.

	MALE		FEMALE	
	Mean	S.D.	Mean	S.D.
Ascendancy	21.1	5.8	20.9	6.0
Responsibility	23.3	5.3	22.1	5.1
Emotional Stability*	23.7	6.0	21.9	6.1
Sociability*	21.7	6.2	23.9	6.0

*The mean differences are significant at the 1% level.

The University of the Philippines business students score higher in ascendancy and responsibility than their American counterpart. Filipino women score lower in emotional stability and higher in sociability than American college students.

5. Gordon [4] reports the following on the SIV based on a sample of 1,075 male and 746 female college students.

	MALE		FEMALE	
	Mean	S.D.	Mean	S.D.
Support*	14.9	5.5	17.8	4.9
Conformity*	12.3	6.6	14.2	6.2
Recognition*	12.4	5.0	12.1	4.9
Independence*	19.3	7.2	16.2	6.6
Benevolence*	13.6	6.5	18.4	5.7
Leadership*	17.3	7.2	11.4	6.5

*Means are significantly different at the 1% level.

University of the Philippines students score higher in conformity and leadership and lower in support, recognition, and independence than American college students. This is consistent with the cultural differences between the two groups. Filipino men and American women seem to be more benevolent than their respective counterparts. Also, the significantly higher score of women in support and conformity in the American sample is replicated in this study and so is the higher score of men in independence and leadership. There is no significant mean difference in benevolence for Filipino students; in fact, recognition is the one that came out significant, but only at an 8% level of significance.

Appendix B

Rotated Factor Matrix

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Rotated Communalities
DAS	.01	.88	.02	-.00	.78
PAS	-.01	.88	.01	.02	.78
Business judgment	.00	.00	-.00	.01	.00
Cautiousness	.41	-.05	.00	-.09	.18
Orig. thinking	.29	.02	.32	.12	.20
Personal relations	.32	-.00	.10	.11	.12
Vigor	.30	-.02	.34	.01	.20
Ascendancy	.13	.02	.67	.12	.48
Responsibility	.62	-.01	.14	0.07	.40
Emo. stability	.52	.04	.07	.06	.28
Sociability	-.02	.03	.58	-.15	.36
Support	-.21	.03	-.11	-.16	.08
Conformity	.14	-.06	-.04	-.28	.11
Recognition	-14	+.01	.04	-04	.02
Independence	-05	.02	-.04	.28	.08
Benevolence	.13	-.00	-.02	-.12	.03
Leadership	.08	-.01	.23	.21	.01
Latent roots	3.30	1.83	1.48	.86	

Sum of the squared roots of the factored matrix = 7.4672

Proportion of the variance explained by the 4 factors = $\frac{7.4672}{17}$ = 43.96%