THE MATURATION OF COLLEGE STUDENTS
as evidenced by the eight semester
average grade points

by

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INTRODUCTION

The possibility of predicting college achievement has been discussed quite widely in the education and psychology journals, but attempts to determine the achievements actually made by the students are few and far between. While this study considers the achievement of college students as revealed by the average grade points recorded semester by semester during the four years of college life it is primarily concerned with the maturation or growth curve which is evidenced by the rise in the average grade points during this period. This statement of our purpose, of course, assumes that there is a growth curve that can be measured by average grade points. To find whether these assumptions are valid we must know the general trend of the average grade points of college students. Do they maintain a relatively even trend or do they rise above or fall below the standard set during the first semester of their freshman year? If they rise or fall how rapid and consistent is this change? These assumptions also necessitate a discussion of reliability of average grade points as an index of maturation or growth. In addition we shall discuss such questions as the following: Do the average grade points reveal minor growth curves which may be recognized by fall-spring fluctuations? Are there significant differences in the average grade points

and trends within the upper third, the middle third and the lower third of the group as classified on the basis of the scores made on intelligence tests or psychological examinations which are given to all under-graduates who are entering the university for the first time? Are there any significant differences in the growth curve or the trend of the average points of boys and girls? And finally what is the value and meaning of the concept of maturation for education, especially university education.

No similar study of the maturation of college students has been reported in the education and psychology journals of this country. However, at different places in our study we shall refer to other studies which contain information pertinent to the issue under consideration at that time.

Procedure

The procedure in general was as follows. A list of the graduates for the last several years was obtained from the Dean's offices--the engineers from the Dean of the School of Engineering and Architecture and the liberal arts students from the Dean of the College of Liberal Arts. This period was chosen because it was thought that a comparison of the scores made on the Intelligence tests or psychological examinations which have been given for the past eight years with the grade points made by the group might be of interest. The list of graduates

was therefore first checked against the records of the scores made on the psychological examinations. If no record of the score was found the individual was not included in this study. Furthermore, the student must have been in residence at this university for eight consecutive semesters. Otherwise it would have been very difficult and in some cases impossible to determine the average grade point by semesters. Confining the grades to those obtained at one university insured as nearly as possible a relatively homogeneous system and standard of grading. After making this selection we began at the beginning of the list which had been arranged alphabetically by the Dean's office and took each name in order until the number reported in this study had been checked.

In evaluating grades, "A" was given a score of three points, "B", two points and "C", one point. No score was given for a "D" while "E" was scored as minus one. The numerical value for a grade was multiplied by the number of hours credit given for the course of study. In this manner the total number of grade points for each semester was determined; this number divided by the number of hours' credit received by the student for the semester's work gave the student's average grade point for the semester. The average grade point for the entire 100 graduates was found by adding the average grade points of all the students and then dividing this sum by the number of students in the group.

Definitions

Wherever the term decile rating of decile grouping are used they refer to the classification of the students on the basis of their scores on the psychological examination. The first decile or the highest ten per cent of the student body taking the examination included those who made the highest scores. While the tenth decile included those who received the lowest scores on the psychological examination.

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STUDENTS IN THE SCHOOL OF ENGINEERING AND ARCHITECTURE

The first investigation analyzed the records of 100 Graduates of the School of Engineering and Architecture. These students were all boys who planned to take up engineering as a life vocation. This study should therefore give us some indication of what might be expected when the students are motivated by a definite vocational objective.

Their classification as revealed by the scores made on the psychological examination is given in Table 1

Table 1

Decile Ratings of 100 Graduates of the School of Engineering and Architecture.

Decile Rank	Number of Students
1st	14
2nd	20
3th	16
4th	13
5th	9
6th	7
7th	7
8th	8
9th	2
10th	4
Total	<u>100</u>

One rather interesting fact brought out by this tabulation is that 50 per cent of the graduates were in the upper 30 per cent of the student body which took this test as freshmen. No decile, however, is without a representative.

The average grade point by semesters for the 100 graduates is given in Table 2

Table 2

The Average Grade Point by Semesters For 100 Graduates of the School of Engineering and Architecture.

Semester	Average Grade Point	Standard Deviation
1st	1.61	0.72
2nd	1.61	0.75
3th	1.36	0.82
4th	1.41	0.81
5th	1.41	0.77
6th	1.54	0.74
7th	1.53	0.73
8th	1.71	0.64

It will be noticed that this group maintains a consistent average grade point record during their freshmen year. However, during their first semester as sophomores they fall 0.25 of a grade point or 15.5 per cent below their record for the freshman year. Several new factors enter the student's experience during this period which may offer some explanation of this sudden drop. The work taken by the sophomore in the school of engineering and architecture is very much more difficult than that taken by the freshman. In fact there is a greater jump in difficulty of subject matter between the freshman and sophomore years than there is between any of the other years. The Dean of the School of Engineering and Architecture believes that this fact is the major cause of the drop in grade points during the third semester.

Perhaps another factor is that the students are now

sophomores and must see that the freshmen are properly initiated into the mysteries of college and fraternity life. Many of these sophomores came to the university as freshman with the idea that the work was very difficult. By hard and consistent work they made respectful records during their freshman year and they feel that they can now "take things easy". This factor will be discussed more at length later in the study.

Still another factor may be noted. Many of the students come to college to take "engineering" and when they have to take work in English, mathematics, economics, physics and other more or less theoretical subjects whose value they do not comprehend or appreciate, they become discouraged for a time and slacken their pace.

All students, however, do not participate in this sophomore slump. Thirty-seven out of the 100 graduates have an equal or higher grade point for their first semesters as sophomores as compared with their second semester as freshmen. The students who do not slump are not confined to any one or more decile groups but are found in every decile except the ninth. The smallest per cent is found in the sixth decile where 14.3 per cent do not slump while the larger group is found in the eight decile where 62.5 per cent do not slump. The standard deviation in the grade

Figure 1

points within a semester is also much greater during the sophomore year than it is during any other year or semester.

After this initial slump the curve is steadily upward and the group finished their senior year 0.10 of a grade point higher than they were as freshmen and 0.35 of a grade point higher than they were during their first semester as sophomores.

In every year except the freshman year a fall-spring fluctuation is noticeable. The average grade point for the fourth semester is 0.05 higher than the third; the sixth is 0.13 higher than the fifth and the eight is 0.18 higher than the seventh.

Comparison of Decile Grouping and Average Grade Points

In order to compare the achievement of different sections of this group it was split into three sub-groups. The grade points of Group I, the first, the second and the third deciles; Group II, the fourth, fifth, and sixth deciles; and Group III, the seventh, eighth, ninth, and tenth deciles are given in Table 3. A graphical presentation of this information is shown in Figure 1.

Table 3

The Average Grade Points by Semesters of Group I, the upper, Group II, the Middle, and Group III, the Lower Decile Groups of Engineers.

Group I				Group II				Group III			
Sem.	Av. Gr.	Pt.	S.D.	Sem.	Av. Gr.	Pt.	S.D.	Sem.	Av. Gr.	Pt.	S.D.
1st	1.88		0.66	1st	1.46		0.80	1st.	1.15		0.64

Sem.	Av.Gr.Pt.	S.D.	Sem.	Av.Gr.Pt.	S.D.	Sem.	Av.Gr.Pt.	S.D.
2nd	1.90	0.66	2nd	1.56	0.56	2nd	1.01	0.72
3th	1.57	0.86	3th	1.24	0.73	3th	1.01	0.66
4th	1.62	0.76	4th	1.17	0.82	4th	1.29	0.73
5th	1.62	0.69	5th	1.34	0.76	5th	1.04	0.73
6th	1.71	0.68	6th	1.53	0.73	6th	1.20	0.79
7th	1.67	0.76	7th	1.43	0.67	7th	1.35	0.68
8th	1.81	0.62	8th	1.68	0.70	8th	1.57	0.61

One rather interesting fact is brought out by this tabulation. For the first semester there is a difference of 0.42 of a grade point between the average of the first group and that of the second, and 0.31 of a grade point between the average of the second and that of the third group. But in the eight semester there is only 0.13 of a grade point between the average of the second and third groups. In other words, the first group lost 0.07 of a grade point while the second group gained 0.22 of a grade point and the third group gained 0.42 of a grade point between the first and eight semester. This information can be expressed in terms of percentage if the average grade point of the entire 100 graduates is taken as a base. This, of course, means a fluctuating base from semester to semester but it does allow us to compare the three groups with reference to the mean of the entire group by semesters. This information is given in Table 4

Table 4

Comparison of the Average Grade Points By Semesters of Group I, II, and III with The Mean of The Entire Group.

Group I		Group II		Group III	
Semesters	%	Semesters	%	Semesters	%
1st	117	1st	91	1st	71
2nd	118	2nd	97	2nd	63
3th	115	3th	91	3th	74
4th	115	4th	83	4th	91
5th	115	5th	95	5th	74
6th	111	6th	99	6th	78
7th	109	7th	93	7th	88
8th	106	8th	93	8th	92

This tabulation shows that Group I maintains its position fairly well for five semesters and then it loses quite rapidly so that by the eight semesters it is 11 per cent lower than it was the first semester. The second group does not maintain nearly as consistent a record as Group I. Its low point of 83 per cent in the fourth semester and its high point of 99 per cent is found in the sixth semester. Group III maintains a more consistent record than Group II but it has two peaks. In the fourth semester it is 91 per cent of the norm and in the eighth semester it is 92 per cent of the norm. This last peak is 21 per cent higher than its record the first semester as freshmen.

The standard deviation within the group by semesters as shown in Table 3 does not seem to possess any particular significance.

While this analysis of the records of 100 graduates of the School of Engineering and Architecture indicates that there is an increase in the size of the average grade point during the eight semesters, it was felt that a larger and more diversified group should be considered before any attempt was made to draw conclusions.

STUDENTS IN THE COLLEGE OF LIBERAL ARTS

One would ordinarily suppose that the vocational objective which is found in the school life of the engineers might make a difference in the results attained in their university work. In order to determine what difference, if any, existed between a group motivated by a definite vocational objective and one where the vocational objective is not so apparent, the records of 100 graduates of the College of Liberal Arts were examined and a comparison was made of the records of the two groups.

The college group was first classified on the basis of the scores made on the psychological examination. The results are shown in Table 5.

Table 5

Decile Ratings of 100 Graduates of the College of Liberal Arts

Decile Rank	Number of Students
1st	12
2nd	17
3th	13
4th	12
5th	10
6th	7
7th	8
8th	8
9th	4
10th	9
Total--	<u>100</u>

The principal difference in decile ratings between this grouping and the grouping of the engineers was that 9 per cent of the Liberal Arts graduates were in the tenth decile while only 4 per cent of the engineers were in this group. But on the whole the classification of the two groups

College of Liberal Arts

Average Grade Points by Semesters of 100 Graduates

Figure 2

was practically the same.

The average grade point by semesters for the 100 graduates is shown in Table 6. This information is also presented graphically in Figure 2.

Table 6

The Average Grade Points by Semesters of 100 Graduates of College of Liberal Arts.

Semester	Average Grade Points
1st	1.51
2nd	1.57
3th	1.50
4th	1.62
5th	1.61
6th	1.69
7th	1.73
8th	1.81

About 3000 individual grades which were given by a large number of instructors during the eight semesters were used in determining these average grade points. With a group of this size and diversification, the eccentricities in grades would tend to cancel out so that the average grade points should furnish a fairly reliable index of the actual achievements of the group.

Here again you will note the third semester slump but it is not as severe as the slump found in the group of engineers. In this group the slump was only 0.07 of a grade point while in the engineers it was 0.25 of a grade point. Fifty per cent of the Liberal Art Students do not participate in the third semester slump while only 37 per cent of the engineers do not drop in grades during this semester. Probably the greater difficultness of subject

matter and practically no chance for choosing elective courses accounts for the greater number and degree of slump among the engineers. The Liberal Arts Graduates who do not drop in their third semester are found in all decile groups. The smallest number is found in the ninth decile where 25 per cent do not slump while the largest number is found in the tenth decile where 67 per cent do not drop in grade points.

If increased difficultness of subject matter is eliminated as a possible cause for the third semester slump and there seems to be no good reason why the third semester subject matter in the Liberal Arts College should be any more difficult than that found in the second semester, then the slump must be considered either as a chance phenomenon or as a social phenomenon which arises out of the social life of the community. If this group is classified on the basis of their affiliation or non-affiliation with fraternities and sororities it is found that 73 belong to one or more fraternities or sororities and that 27 do not belong to any fraternities or sororities. It might also be stated that practically all of the students in this group who held official positions in campus activities also belonged to one or more fraternities or sororities. Of the 73 who belonged to a fraternity or sorority 36 or 49 per cent participated in the sophomore or third semester slump; of the 27 who did not belong to a fraternity or sorority 14 or 51.8 per cent

participated in the slump. This immediately reveals that membership or non-membership in fraternities or sororities has a slight if any connection with the drop in grade points. The above facts together with the further fact that 50 per cent of the students do not slump might indicate that this is a more or less chance fluctuation caused by factors, social and otherwise, which we have been unable to isolate.

For this group a fall-spring fluctuation occurs throughout the four years. The second semester is 0.06 of a grade point higher than the first, the fourth is 0.12 higher than the third, the sixth is 0.08 higher than the fifth and the eighth is 0.08 higher than the seventh semester.

This fall-spring fluctuation was also found by Miss Ruth Byrns(5) who made a study of the grades of the undergraduate student body at the University of Wisconsin over a period of eight semesters extending from 1925-1926 to 1928-1929 in which a total of over 55,500 student averages were used. Among other things she found that "there is a marked tendency for the grades of every group to be higher in the second semester of each year than they were in the first semester. That students who do unsatisfactory work are dropped or voluntarily withdraw before the second semester is only one of the factors that produce this condition." Miss Byrns thinks that much of this increase in the second semester is due to the fact, (1) that the students are better adjusted to university life the second semester than they are the first

and (2) that there is a carry over where the courses are continued into the second semester. A further discussion of the causes for this phenomenon will be found in the section dealing with the factors affecting grades.

Comparison of Grade Points and Position Within the Group

In order to determine whether there were any significant differences in the grade points and trends within the upper third, the middle third and the lower third of the group studied, the 100 graduates were divided into three groups. The scores on the psychological examination were taken as a basis for the classification. Group I included the first, second, and third deciles, Group II, the fourth, fifth and sixth deciles, and Group III the seventh, eighth, ninth and tenth deciles. The grade points of the three groups by semesters are given in Table 8. The percentage each semester's average grade point is of the average grade point of the entire group for that semester is also given.

Table 8

The Average Grade Points By Semesters of Groups I, II and III and the Percentage These Grade Points Are of The Mean of The Entire Group.

Group I			Group II			Group III		
Sem.	Av.Gr.Pt.	%	Sem.	Av.Gr.Pt.	%	Sem.	Av.Gr.Pt.	%
1st	1.85	125	1st	1.45	96	1st	1.07	71
2nd	1.87	119	2nd	1.57	100	2nd	1.14	73
3th	1.78	119	3th	1.53	102	3th	1.06	71
4th	1.43	91	4th	1.64	101	4th	1.12	69
5th	1.83	114	5th	1.62	101	5th	1.30	81
6th	1.49	85	6th	1.58	93	6th	1.39	82
7th	1.99	115	7th	1.63	94	7th	1.47	85
8th	2.02	112	8th	1.78	98	8th	1.54	85

This tabulation also shows that the lower decile group makes a greater percentage of improvement than do the higher groups. Group I, more or less consistently, loses ground and finishes the eight semester 11 per cent lower than it was during the first semester. Group II maintains its relatively consistent position throughout the eight semesters. Group III improves its position during the eight semesters and finished the eight semester 14 per cent higher than it was the first semester. Comparable data for the engineers is as follows: Group I shows the same percentage of decrease as the college group, 11 per cent. Group II has a more or less variable record but it finishes the eight semester 7 per cent higher than it was the first semester. Group III also has a variable record. However, its position for the eight semester is 21 per cent higher than its first semester record.

The 100 graduates were reclassified on the basis of their initial average grade point or their grade point for the first semester so that a comparison might be made between this grouping and the one made on the basis of the scores on the psychological examination. Group I in this classification included the highest 34 per cent of the group, Group II included the next 33 per cent and Group III included the lowest 33 per cent of the group. The average grade point is of the grade point of the entire group for that semester is also given.

College of Liberal Arts Graduates Grouped By Grade Points and By Scores on Psychological Examinations

Figure 3

Table 9

Comparison of the Average Grade Points by Semesters of Group 1, 11, and Group 111 Classified on the Basis of Initial Grade Points, With the Mean of the Entire Group.

Group 1			Group 11			Group 111		
Sem.	Av.Gr.	Pt. %	Sem.	Av.Gr.	Pt. %	Sem.	Av.Gr.	Pt. %
1st	2.48	164	1st	1.50	99	1st	0.64	42
2nd	2.08	132	2nd	1.50	96	2nd	1.12	71
3th	2.03	135	3th	1.48	99	3th	0.97	65
4th	2.04	126	4th	1.70	105	4th	1.11	69
5th	1.97	122	5th	1.54	96	5th	1.32	82
6th	1.99	113	6th	1.66	93	6th	1.40	82
7th	2.00	116	7th	1.78	103	7th	1.54	85
8th	2.13	118	8th	1.74	96	8th	1.42	83

When the grade points for the group classified on the basis of the scores on the psychological examination and those for the group classified on the basis of their grade points during the first semester are charted, as they are in Figure 3, the great similarity and the one outstanding difference are very evident. The curves for Groups 11 and 111 in both classifications are practically the same. However, Group 1 as classified on the basis of initial grade points starts much higher than does the group classified on the basis of scores on the psychological examination; it drops in the second semester and from then on maintains a more or less stable equilibrium around 2.00 or about a B grade. The group classified on the basis of the scores on the psychological examination scores fluctuates quite widely but it never establishes its average grade point as high as the group based on the initial average grade point. The large drop in the average grade point of Group 1 might indicate that they came to school and did their best during the

Gains Classified on Basis of Initial Score on Tests

Figure 4

first semester. The remaining seven semesters' records, however, indicate that the remainder of their university work did not offer the same challenge to them and they slackened their pace and lowered their standards.

Gains Made by Students Retested With Intelligence Tests

Dr. O.B. Baldwin (2) studied the gains made by students when they were retested with the National Council Tests at various intervals of time. He makes the following comment in discussing his results. "Our next inquiry was whether or not the size of the initial score would show any correspondence to the amount of the gain. Using our 61 seniors whose retest of scores were available during the summer of 1929 we find an r of the initial scores and gains of plus .124, indicating that the amount of the gain bears a little relation to the size of the score.

"It will be remembered that Tc scores are standard deviation units. All scores in the thirties are minus 2 S.D. scores; and all in the sixties are plus 2 S.D. scores. It is interesting to know the mean over the various time intervals for each of these groups. If we omit our scores in the twenties and seventies where our frequencies are insignificant we find the information which is graphically depicted on Plate XIII (Figure 4 of this study). It will be seen that the high and low sections (those with initial scores in the thirties or sixties) seem to have a gradient entirely different from that of those individuals who are grouped more closely to the mean. An interesting question immediately demands

consideration. Does college life offer more stimulation to the extreme students, either high or low, than it does to the mediocre? It will be noticed that those students whose initial test scores are in the plus 2 S.D. group show no indication of the sophomore slump. The minus 2 S.D. group show the same retardation at the one and one half year interval as the other groups but the slump continued and reaches its maximum depth at the two year interval. The indication is that the slower student finds his period of intellectual orientation a more extended process than do the more alert groups, and that for him the more permanent growth shows itself as a result of a longer period of stimulation. The rather extraordinary gains of this group, both for the one day and the one year interval, brings the suspicion that the initial scores are too low. It is quite probable that here the initial scores were depressed by emotional blocking. A very legitimate skepticism of their own capacity produces the consequent feeling of inadequacy. Familiarity with the technique of testing, during the second testing, dispels to some extent this retarding emotional tension and brings the score up to its legitimate level. The relative uniformity of the plus 1 S.D. and the minus 1 S.D. group of the one year interval we find their curves almost parallel."

The personnel of the groups considered in the present study and that of the groups Dr. Baldwin studied are entirely

different. The groupings we have made are different from those he made, yet there are several interesting comparisons that can be drawn. The group with the highest initial scores in Dr. Baldwin's study made the greatest gain in the retest. The groups showing the highest initial scores in this study, whether we consider scores on psychological examinations or average grade points for the first semester, are the only groups that show a large and more or less consistent drop from their original starting point. In other words, the group in Dr. Baldwin's study that made the greatest gains is the group in this study that has the greatest loss or decline. The curve showing the gains made by the middle or central groups in both studies is quite similar; it gradually rises throughout the entire curve and the fluctuations are quite small. The achievements of Group III or the lower group in both studies differ radically. The curve for the lower group in Dr. Baldwin's study rises quite rapidly during the first year, falls as rapidly and almost as far the second year as it came the first year and then during the third year it rises very gradually. In this study the lower group rises during the first semester, slumps slightly the second semester and then rises more rapidly than do any of the other groups during the remaining two and one half years or five semesters covered in this study. In other words, the lowest group in this study made gains that are quite comparable with the gains made by the highest group in this study of Dr. Baldwin's.

Dr. Baldwin as a part of this same study tried to secure a group of young people about college age whom he might test over a two semester interval and in this way check the gains for which a college environment is responsible. When he was unable to gain access to such a group, he turned to the penal institutions in the hope that this type of group might be selected from the general population of these institutions. He was able to select such a group but "very little use can be made of these data as a check against the gains of college students. The level of achievement is altogether too low to draw any conclusion. If, however, we make the somewhat doubtful assumption that Class B and Class A, of the Army Alpha, may be called college quality, we might study this selected group. From each institution, the State Penitentiary at Lansing, Kansas, and the Reformatory School at Hutchinson, Kansas, we find eleven men who would be classed A or B in the army rating"-----"We have from this small group the fact of a loss of 0.37 Alpha points in about a year's time. The writer was able to observe no signs of loafing or lack of motivation at the time of the retest in either institution. Taking the figures for what they are worth, it would appear that maturation for this age is a matter, not of automatic inner growth but of the type of stimulation" (pp. 64-66). We shall consider these studies more in detail later in this study when we discuss maturation as the possible explanation for these achievements.

IV

COMPARISON OF BOYS AND GIRLS IN THE COLLEGE OF LIBERAL ARTS

A comparison of the type we have been making always arouses the curiosity concerning possible sex differences. Are there any difference and if so what are they? In order to determine what information a study of this group would reveal, the 100 graduates were classified on the basis of sex. Since the group of graduates was as nearly as possible a random selection, the boys and girls within the group should be a typical sample of what might be found if the the grade points of all the boys and girls who graduate were considered.

The decile classification is given in Table 10 on the basis of scores of the psychological examination.

Table 10

Decile Ratings of 100 Graduates of College of Liberal Arts
Classified on the Basis of Sex.

Boys		Girls	
Decile Rank	Number	Decile Rank	Number
1	6	1	6
2	9	2	8
3	9	3	4
4	5	4	7
5	5	5	5
6	2	6	5
7	3	7	5
8	3	8	5
9	3	9	1
10	1	10	8
Total	<u>46</u>	Total	<u>54</u>

If this classification is divided into three groups in which Group 1 includes the first, second, and third deciles, Group 11 the fourth, fifth and sixth deciles, and Group 111 the seventh, eighth, ninth and tenth deciles, one very interesting fact appears. Group 1 among the boys includes 52 per cent of the entire group of boys while only 33 per cent of the girls are found in this group. In other words 19 per cent more boys than girls are found in Group 1. Group 11 includes 26 per cent of the boys and 32 per cent of the girls. Group 111 includes 22 per cent of the boys and 74 per cent of the girls. If this classification is divided into two groups instead of three, 74 per cent of the boys are in the first five deciles while only 56 per cent of the girls are in this group. Twenty-six per cent of the boys are in the last five deciles while 44 per cent of the girls are in this group. This percentage among the boys in the college is practically the same as that found among the engineers. In the College 74 per cent of the boys are in the upper five deciles while 72 of the engineers are in this group. The question immediately arises, why is there such a discrepancy between the percentage of boys and girls found in the different groups. It may be just a chance happening, but the concensus of opinion of the group with whom we have discussed this problem is that these results are not due to chance. The women student counselors usually spend much more

time and effort assisting their advisees than do the men advisors with the result that the girls get help in adjusting their difficulties to the satisfaction of the college administration. Boys, on the other hand, frequently do not receive this assistance and they fail to make the necessary adjustments. The college administration is also probably a little more lenient in dismissing girls because of poor scholarship than they are in dismissing boys, consequently girls are frequently allowed to stay when boys are forced to leave school. The administration, however, is not entirely to blame for this situation. Interest in the classwork, a conscientious attention to details and a general attitude of cooperation are generally more apparent among girls than among boys and not infrequently the evidencing of these attitudes will allow one to continue in school when otherwise he or she would be dismissed. This may in part account for the greater leniency on the part of the administration toward girls than toward boys. Another factor might be that the girls are much more hesitant about leaving school and going to work. If the boys are doing only fairly well in their school work they are apt to quit school and get a job. However, under similar conditions the girls do not feel nearly as free to follow the course of their brother, consequently they stay in school. This view is supported by the grade points received by the boys and girls, especially during the first

College of Liberal Arts

Average Grade Point By Semesters of
100 Graduates — 46 Boys and 54 Girls

Grade
Points

Figure 5

three years. The grade points for the two groups are given in Table 11.

Table 11

Average Grade Points By Semesters for Boys and Girls in The College of Liberal Arts.

Boys			Girls		
Semester	Av. Gr. Pt.		Semester	Av. Gr. Pt.	
1st	1.63		1st	1.40	
2nd	1.67		2nd	1.48	
3th	1.61		3th	1.41	
4th	1.63		4th	1.57	
5t	1.63		5th	1.56	
6th	1.77		6th	1.62	
7th	1.71		7th	1.75	
8th	1.83		8th	1.79	

You will note that the boys start off with a much higher grade point than do the girls and except for the seventh semester the boys maintain an average that is higher than that of the girls.

The curve of development drawn from the average grade points made by the boys, Figure 5, reminds one of the curve of development for Group 11 (Figure 3) of the 100 graduates of the College of Liberal Arts, while the curve drawn from the girls' record is very similar to the development curve for Group 111 (Figure 3). This similarity between the girls' curve of development and the curve for the lower decile groups in the college suggests that the college program is more adapted to the needs of the average and below average girls than it is to the needs of the more brilliant boys and girls who stay in the college for four years. However, due to the dissimilarity between the boys and girls in this

College of Liberal Arts

Grade
Points

Average Grade Points by Semesters
of 100 Graduates in 2nd and 3rd
Deciles - 50 Boys and 50 Girls.

Figure 6

study, it is impossible to draw any conclusions relative to the comparative ability and performance of the two sexes.

In order to get as homogeneous a group as possible for comparing boys and girls, it was decided to select 50 girls and 50 boys who were in the second and third decile groups and who were at the same time graduates of the Liberat Arts College. The same procedure which had been used with the other groups was followed with this group with one exception, only those in the second and third deciles were selected. This procedure resulted in the selection of 25 boys from each of the two deciles while it selected 28 girls from the second decile and 22 girls from the third decile.

The average grade points by semesters for boys and girls as well as the average grade points for the combined group is given in Table 12. It is also shown graphically in Figure 6.

Table 12

Average Grade Points By Semesters for Boys and Girls in the Second and Third Deciles.

Boys		Girls		Combined	
Semester	Av. Gr. Pt.	Semester	Av. Gr. Pt.	Sem.	Av. Gr. Pt.
1st	1.60	1st	1.84	1st	1.72
2nd	1.65	2nd	1.70	2nd	1.67
3th	1.57	3th	1.68	3th	1.63
4th	1.79	4th	1.90	4th	1.85
5th	1.67	5th	1.72	5th	1.69
6th	1.83	6th	1.78	6th	1.81
7th	1.69	7th	1.78	7th	1.74
8th	1.89	8th	1.93	8th	1.91

The girls start 0.24 of a grade point higher than the boys but the second semester they drop 0.14 of a grade point while the boys gain 0.05 of a grade point. The girls finish the

third semester only 0.11 of a grade point higher than the boys. From this point on there is only one significant change in the relative positions. In the sixth semester the girls are 0.05 of a grade point lower than the boys but outside of this one drop their average grade point is always higher than that of the boys, yet there is not enough difference to justify one in saying that there is any significant difference in the average grade points of boys and girls at least in a more or less homogeneous group such as we have here. However, to the extent that one considers average grade points as an index of students' adjustment to the university life, you would have to say that girls make a better adjustment than boys.

The sophomore slump loses part of its significance when the grades of this group are studied. The greatest drop comes in their first semester as juniors. The fifth semester average grade point is 0.16 of a grade point lower than the fourth semester's record. The seventh semester's record is 0.07 lower than the sixth semester's average grade point while the third semester drop, which in the other studies has been the largest, is the smallest of any fall semester drop. The third semester, however, is the low point for this group as it has been for all of the others.

The large drop in the girls' average grade point for the second semester prevents this group from having a reg-

ular fall-spring fluctuation. However, outside of the freshman year there is a very pronounced fall-spring fluctuation; i.e. the spring grade points are much higher than the previous fall grade points. On the other hand, however, the fall semester grades are much lower than the previous spring semester grades. This fall-spring fluctuation is noticed among the boys even in the freshman year.

V

FACTORS AFFECTING GRADES

Now that we have found that there is a gradual increase in the size of the average grade point of the three groups considered in this study, how are we going to explain this phenomenon? It is true that this increase in the size of the average grade point is only a small absolute increase, but since it is an increase on the part of a large group, the small absolute increase becomes very significant. If the record of the unselected college group is considered as a sample, the absolute increase in size is only 0.31 of a grade point, possibly the difference between a C plus and a B minus, but if the first semester's average grade point is considered as a base then this increase is practically a 20 per cent increase in the mean of the entire group. An increase of that proportion is important.

A change, development, or growth such as this, which is depicted in Figure 2, can be explained by showing (1) that the change or development is due to changes in the instruments or measurement, (2) that it is due to changes in the phenomena under consideration, or (3) that it is due to changes in both the instruments of measurement and the phenomena being measured. We shall examine these various possibilities and see if we can discover what is actually happening.

When an attempt is made to measure the growth of intelligence or the development of behavior, however the problem mentioned by Thorndike in the following quotation immediately

arises. (25) pp. 11-12. "All scientific measurement of intelligence that we have at present are measures of some product produced by the person or animal in question, or of the way in which some product is produced. A. is rated more intelligent than B. because he produces a better product, essay written, answer found, choice made, completion supplied and the like, or produces an equally good product in a better way, more quickly or by inference rather than by rote memory or by more ingenious use of the material at hand." Again on page 403 he says, "It is not at present to distinguish at all accurately within the general gain in intellect with age from 0 to 15 years or later, the share of mere maturity, mere inner growth, from the share of experience and training which age implies. The reasons for this failure are much the same as for the failure to distinguish the shares of original capacity and environmental circumstances in determination of intellect. We lack tests which measure maturity by itself, and tests which measure training by itself. We also lack extensive investigations using the partial correlation technique with such imperfect symptoms of maturity and training as are available." In other words, if we agree with Thorndike we shall not at present be able to differentiate accurately the growth in intelligence or the change in average grade points which is caused by "maturity, mere inner growth" from that caused by "experience and training".

We shall have to consider the changes or development as a growth of the organism as a whole which can only be measured by achievement in some activity or activities. However we can discuss and make an attempt to evaluate the various factors or conditions which affect this development. In this section we shall discuss the factors which affect grades.

No studies have been reported in which the grade points for the same group have been determined for each of the eight semesters. It is impossible to consider the grades for the entire college or university since more and more of the failures are dropping out of school. This would naturally result in a rising mean during the eight semesters. While there will be some low and possible failing grades among the upper classmen there will not be as many as there are among the lower classmen and if this group is limited, still further to students who graduate, the number of low grades and failures is more and more limited. A student might receive several low grades in his freshman and sophomore years and yet overcome this handicap and graduate, but it is very unlikely that a student will make border-line grades throughout the four years. He probably would not stay in the university long enough to make such a record. If he made good grades during the first year or two he would probably continue to do so throughout the four years or he would quit school. The above facts, however, do not

account for all of the increase in the size of the average grade points for the entire college but they do indicate why the grade points of the entire college can not be compared with those of a selected group which continues throughout the eight semesters. Tallman (24) at the University of Iowa, and Byrns(5) at the University of Wisconsin came to this same conclusion as a result of studies made at their respective universities.

But in addition to the above facts there are still several possible changes in the instruments of measurement or average grade points that might account for part of the change or development that takes place.

One factor that must be considered is the basis for the comment that one frequently hears about the greater sophistication of upper classmen in the lore of how grades are determined. The upper classmen have been at the university several years. They are better acquainted with the university methods and consequently are supposed to know more about how to do the work that the professors require. They frequently live at a fraternity where the problems and quizzes which the professors have given in the past years are kept from year to year. This allows them to know with a reasonable degree of certainty what the professor expects. This is especially true where the professors have taught in the same university for several years

and have become more or less set in their methods. This same condition however is also found among the underclassmen who live at the fraternities.

The juniors and seniors become acquainted with "readers" in the various departments. This frequently allows them to exert an influence on their grades with a skill that the underclassmen do not possess. While the underclassmen may know the "readers" who grade their papers, they ordinarily do not have the "influence" or "pull" of the upperclassmen. In other words, the assumption underlying this argument is that even though the juniors and seniors do the same quality or even a poorer quality of work than do the underclassmen, they get better grades because they are "on to the ropes" or "have a pull". How valid this assumption is no one knows definitely for it would be impossible to measure quantitatively social forces such as are mentioned above. However the question may well be raised whether the changes which may be produced by the skilled use or manipulation of these forces is a change in the instrument or measurement or whether it is a development or growth in the students which gives them an increased insight into the factors influencing the instructor's rating of their achievements. The students live in a world which is influenced by social forces and learning how to recognize, evaluate, and use these social forces is just as much a part of their education as learning how to

solve an algebra problem. Growth is a function of both activities.

This condition is very well illustrated by the change and development made during the past semester by a student whom we shall call Joe. He had come to the University as a freshman from a small high school of about 300 students. Because of financial conditions he had worked most of the time after school in a drug store where he became intimately acquainted with three boys about his age who spent a large part of their leisure time around the store. These conditions limited Joe's social contacts to the face to face intimate associations of the small town. When he came to the University, he met for the first time the more or less impersonal atmosphere of the larger group. He felt that all of the people at the University were "snobs" who were putting on a "false front"; the teachers were too impersonal and did not care what became of him. Joe's big problem, therefore, was one of learning how to adjust himself to these more or less impersonal conditions which are found in the classroom as well as on the campus. He had to learn to recognize, evaluate and use the factors or conditions found in this social problem just as he had to go through this process of in learning to solve an algebra problem. As he has learned to make these social adjustments to his instructors and fellow students more effectively, his class work has improved.

This indicates that social factors condition all school activities and must be considered in any study of the growth or development of intelligent behavior, whether that development be made in the freshman or in the senior year.

The argument is also advanced that the instructors grade juniors and seniors easier than they do freshmen and sophomores. The freshmen are not supposed to know very much when they come to the university and consequently they are put on the defensive. They must prove their case. Many instructors give them a lower grade at mid-semester than they might have earned on the theory that it will keep them working at their best. With juniors and seniors the case is reversed. If the students have reached the junior or senior rank, they are supposed to be fairly good students and consequently the instructors do not examine their work as critically as they would the work of freshmen and sophomores where many are expected to fail. This more or less allows the student to float along on his reputation gained in former years.

Another assumption that is closely allied to the above argument, is that familiarity with the students on the part of the instructors results in an increase in grades given without a corresponding increase in achievement. For instance, students come into their future major department for their first courses as freshmen or sophomores. As new-

comers they must prove their case; they must prove that they are capable of A or B work before they receive this grade. In this way they establish their reputation. The professors in the department become better acquainted with them as major students. They remember what the students did as freshmen or sophomores and allow the student's reputation to influence unduly their decision in determining grades. As they become more familiar with the students, they are inclined to lower the standard of achievement required of the students without at the same time lowering the grade which is given in recognition of a certain level of achievement.

Three studies have been published where an attempt was made to evaluate the "acquaintance factor" or the affect of familiarity upon ratings made of the achievements of others. Rugg (20) lays down thorough acquaintance as one of the three essentials for the reliable rating of human character which includes physical qualities, intelligence, leadership, personal qualities and general value. He also states that the judgments of three or four individuals must be evaluated before an accurate judgment of human character can be obtained. Rugg considers that an accurate judgment has been made if the individual is correctly placed within one of five possible groups. Knight (14) concludes from his study that "the Factor of Acquaintance, then, operates to make ratings more lenient, i.e., increases the over-rating, and to make

ratings less critical and less analytical, i.e., increases the influence of the halo of general estimation. It is in the direction of truth to discount the rating of judges when acquaintance has been long. In a way it is literally true to say of a judge's estimate; "His judgment is of doubtful validity because he has known his man too long." In the light of other studies it is difficult to take Knight's study at its face value, but even if we do, the acquaintance factor as discussed in his study would not explain this increase in the size of the average grade points for the instructors have not known the students long enough for the overestimation due to friendship to be as great as the rise in grade points. The further fact that the individual students average grade points for each semester has been determined by the ratings of from three to six instructors would, according to Knight, increase "the value of the estimates". and lower the value placed upon the acquaintance factor. Shen (21) reported on a study in which intellectual quickness, intellectual profoundness, memory, impulsiveness, adaptability, persistence, leadership and scholarship were rated. "When we conclude that there is a definite tendency toward overestimation according to friendship, we must remember that much the larger part of the errors is due to other unknown factors". These studies indicate that this rise in average grade points, cannot be explained on the basis of the acquaintance or friendship factor.

While we have more or less taken these studies of the "acquaintance factor" in rating at their face value, we believe that the assumptions upon which they have been made are entirely fallacious. The experimenters have assumed that these traits that have been studied are more or less separate and discrete entities which remain constant from situation to situation. This however is not the case. The traits are aspects of a total organized, integrated situation from which they derive their properties or qualities and as this situation changes these traits change. Of course there is no radical change or variation but there is enough of a change that the estimate of the close friends may easily be and probably is a much more expanded and differentiated evaluation than that made by casual acquaintances. Knight says that friendship "increases the influence of the halo of general estimation". Might it not be more accurate to say that the friendship has allowed the person making the rating not only to expand his conception of what the person rated really is but it has also allowed him to more accurately differentiate and evaluate these factors as a part of this expanded individual which he knows, but which the casual acquaintance does not know. In reality two people rating a third person, do not rate objective discrete traits; they rate these traits as aspects or parts of the total situation of which they are a member. The two ratings will naturally vary for the two situations are different. This is especially true if one

person is an intimate friend of the person being rated while the other person is only a casual acquaintance. This question will be considered more adequately when we discuss the process of maturation.

Another factor that might affect grades is that frequently the upperclassmen are in classes with lowerclassmen. Under these conditions the upperclassmen ordinarily get the best grades. Where they are compared with the underclassmen, however, they frequently and usually have not had any more class work in that department than have the freshmen and sophomores. Is this difference due to the fact that the juniors and seniors are able to do more work and thus get

better grades because of the quantity of work, or do they get better grades because of a greater maturity and hence an ability to do a higher quality of work? Tallman (24) made "A Critical Analysis of Student Persistence At The State University of Iowa" and among other things he found the following: "Although this group remains identical for the four years it does not follow that they are in competition with identically the same group each year. The large increment of students who enter the sophomore, junior and senior classes from other institutions, and the placing of juniors and seniors in classes which are also open to graduate students, changes the relative basis of competition materially. The isolation of these factors must be left for a future study. These data do show, however, that a

a group of identical students receive higher grades from year to year measured on a grade-point basis than does a group of non-identical students.

This quotation from Tallman gives at least two facts which are pertinent to the issues under consideration in this study. (1) The average grade point for a group of identical students increases in size from year to year, and (2) in a large university, such as the University of Iowa, juniors and seniors probably compete with graduate students as frequently as they compete with freshmen and sophomores. We know of no study which attempts to isolate and evaluate this factor, but we do know that in many instances, at the University of Kansas, juniors and seniors compete with graduate students as much or more than they compete with freshmen and sophomores. In a large university the advantages and disadvantages resulting from the upper classmen competing with underclassmen and with graduate students probably cancel so that the end result will not be influenced one way or the other.

The upperclassmen have their group requirements filled and they can now work in their major departments where they presumably have the greatest interest. If interest and ability are closely correlated as many claim, then the upperclassmen should do better work for they are doing the kind of work they are best qualified to do. Wilson (28) in his study on the "Interests of College Students" says, "There is

a moderately high correlation (0.34) between the number of courses taken and the scholarship gained in a given department, indicating that the student does his best work generally in those courses which he chooses more freely." We might very well readily admit with Wilson that there is a correlation between the number of courses taken and the scholarship gained but we might well question to what extent this correlation is due to the student's interest and freedom to select courses. Rather might not this better scholarship be due to the fact that the student is reacting or adjusting himself more and more to the detail or differentiated aspects of the subject. This process increases the complexity of his responses and produces a higher type of achievement. When a student first enters a class or first studies any subject, he reacts in a clumsy manner to the grosser aspects of the subject matter just as a person first learning to drive an automobile reacts in a clumsy manner to the grosser aspects of the total situation. As he increases his insight into the mechanism of the automobile or gets a better understanding of the subject-matter, he reacts more and more to the differentiated aspects of the situation. This is the process of acquiring skill or learning and a skilled individual always produces a higher type of achievement than does the unskilled individual. In other words, the greater achievement is due to the growth or maturation of the student of which interest is an aspect, but not

the entire cause as Wilson would have us believe.

The fact that students who rank high on the psychological usually rank high in scholastic achievement, suggests the possibility that the two instruments of measurement measure the same or similar phenomena. In fact this similarity is usually the most common basis for criticisms which are hurled against the intelligence tests. If we could get retests on psychological examinations at various intervals of time comparable to the semester intervals, we would have an instrument of measurement which would eliminate many if not all of the questionable features which have arisen in connection with grade points as an instrument of measurement. The scores of the tests would not be familiar with the students in the way that an instructor might be and even if the scorer was familiar with the student he is using a much more objective measurement which does not allow familiarity or "pull" to affect the final result. The various classes could be compared with each other and the question of comparing upperclassmen with underclassmen could be eliminated. The student's interest in the retesting program would probably remain as a more or less constant factor throughout the retests. Hence Student's interest in the subject matter and the instructor's interest in the student could not influence the results in the way that it might affect the achievement in the student's major department. In other words variation in the instrument of measurement could be removed. Any change therefore must be changes in the phenomena under consideration.

Figure 7

Dr. Baldwin (2) as a part of the study previously mentioned retested 1343 college students at Friend's University and the University of Kansas. The mean gain for this group at various intervals of time is given in Table 7

Table 7

Time Interval Between Retests	Mean Gain
1 day	5.77
4 weeks	6.54
1 year	7.52
1½ years	6.84
2 years	7.48
3 years	8.69

A graphic comparison of the gains on retests with psychological examinations and the increase in the average grade point is presented in Figure 7. The similarity between the two curves is indeed striking. By using the retests on psychological examinations as an instrument of measurement, the objectional features found in the average grade points are removed yet the curve drawn from the gains made during the retests is practically the same as that found when average grade points are used as a basis. Dr. Baldwin's comments on his results are found in the following quotation. (pp. 59-61)

"Just as we have the general condition in which it is impossible to differentiate between maturation and learning, we have also the more detailed difficulty of differentiating between 'practice', 'inner growth', and 'learning' in the analysis of intelligence scores. It seems to the writer that practice effect increases scores of intelligence tests through its influence upon the factor of speed of reactions rather than upon the factor of altitude or level or degree

of difficulty of the reactions. In response to questioning students retested over a short interval, they explain their gains by the fact that they can 'get the idea' in a very short space of time. This means that more and more the initially insignificant features of the configuration have become the cues of the perceptual pattern and the comparatively few and gross reactions have been supplanted by the more numerous but precise reactions. In analogy tests, for example, the practiced individual reacts not by floundering among the big ideas of the task, such as the idea of relations 'just as-----so also', but responds to the more minute details of the particular situation. The individual has learned, he has 'extended his insight' into a given situation and has increased the complexity of his reactions'. He responds to the 'constant but abstract features of a changing stimulus pattern'. Certainly here is evidenced a differentiation of energy patterns of the nervous system' and we are justified in classifying the more minute changes, the differences in organization or the development under stimulation of dormant cells, as maturation. Returning to Plate XVlll (Figure 4, page of this study) we can say that the sharp initial rise of our curve is due to a maturation comparable to that of rats, or chickens, or goldfish, which 'learn' to respond to a pattern of lights or shades of gray. The slower gains of the later periods come from the more deliberate ascent from one level of difficulty

to another, which constitutes an index of a change of 'altitude' of intelligence. So instead of the rather labored unconvincing distinction of 'practice effect' and 'maturation' it is much simpler to consider the entire curve a growth process. Certainly the maturation which results from controlled stimulation is just as truly maturation as that 'inner growth' which comes through these factors of stimulation which are beyond control. However we must recognize that this maturation is of a rather specific type which is accompanied by an insight into a particular situation.

VI

THE PROBLEM OF MATURATION

Our discussion so far has indicated that this change, development or growth can not be explained on the basis of changes in the instruments of measurement for a similar curve is found when instruments of measurement are used which remain constant throughout the period measured. We have at various times during our discussion hinted that we considered this curve a curve a maturation. We shall next therefore examine the evidence to see to what extent it supports this assumption.

Carmichael (6) has studied the development of the behavior of frogs and salamanders which had been removed from all external stimulation except the medium in which they developed. Before the embryos developed far enough for any signs of activity to appear, they were divided and placed into two separate receptacles. One group was placed in a pan which contained tap water; this group acted as a control group. The other group was placed in a pan of chlore-tone which prevented noticeable activity, but allowed the embryos to mature normally. In comparing the development of the two groups, Carmichael says, "The development of the drugged and normal embryos as judged by external appearance was quite similar. In all cases, however, development seemed to be somewhat more slow in the anesthetized group" (Vol. 34, p. 41). When the control group had developed normal swimming activity, the drugged embryos were removed one by

one and placed in tap water and the time required for them to develop normal swimming activity was noted. As soon as the anaesthetic wore off the drugged group was swimming as naturally as the control group. In order to determine whether the period between the time they were removed from the chlorethane and the time they were swimming normally was a period of rapid learning or whether it was simply the time required for the anaesthetic to wear off the group which developed in chlorethane was replaced in this solution for twenty four hours and then returned to the tap water where the time which elapsed before they began normal swimming activities was again noted. Since there was no significant difference in the time required to develop normal activity, the conclusion was drawn that this period of sluggishness was due to the anaesthetic wearing off instead of being a period of rapid learning. As a further check in his results he allowed one group of embryos to develop in a noisy room, another in a quiet room and a third group to develop in a sound and light proof room. As soon as the first two groups developed normal activity, he went into the sound and light proof room and suddenly flashed a light into the pan where the embryos were. As soon as the light flashed upon the embryos, they darted around with just a great skill as that exhibited by the other groups. While none of these groups had separated from an environment which allowed normal development, the experimental group developed behavior patterns which allowed

them to swim normally without previous exercise. This indicates that the development of these behavior patterns is the resultant of the maturation process and not learning by "trial and error", exercise and repetition or experience.

Wheeler (26) reports an unpublished study by Bird (3) as follows: (pp.297-298) "Additional doubt has been cast upon the value of sheer repetition in learning by Bird in his experiments on pecking in chicks. Large numbers of chicks were hatched in absolute darkness and confined there until they were taken out for purposes of experimentation. One group was removed shortly after hatching and their accuracy of pecking was very carefully controlled and measured; another group was selected at the end of 24 hours when similar observations were made; still other groups were used at the end of 36 and 48 hours. In the meantime none of the chicks had practiced pecking for they will not peck in the dark, although they are hungry. In general, within the limits of the experiment, the older the chicks the more accurate their pecking movements, hence a curve was obtained resembling a learning curve. This could not have been a practice curve but on the contrary a result of maturation.

"Each group of chicks was allowed 25 test trials, then returned to the dark. After their second period of practice, they were permitted to feed naturally 8 hours a day. The accompanying curve merely shows the initial performance of the four groups. The group tested on the day of hatching

averaged less than one swallowing reaction in twenty-five trials. The day old chicks (group1) made an average of 1.8 swallowing reactions, the two-day old chicks (group2) scored 2.64 and the three-day old group averaged 3.53. The second day's performance of group 1 was 2.9 after 25 practice trials, a record almost equalled by group 2 which started on the second day with no practice. The second day's performance by group 2 was 5.6 while the first performance of group 3, the same age as group 2, was 3.58 with no practice. The first performance of group 4, 4.63 almost equalled the second performance of group 3, which was 5.10. Hence only a small amount of improvement, if any, between the first and second day's practice was conditioned by that practice. The difference might have been caused by the greater vitality of the chicks which had been given an opportunity to eat."

Wheeler makes this addition comment upon Bird's experiment. "Another significant feature of Bird's findings is their relation to Snoddy's work on the recess period. Snoddy has emphasized more than any other investigator of the learnign process that an interval of time between repetitions is more important than frequency of repetitions. What Bird found when there were no repetitions is precisely what Snoddy is referring to in stressing the importance of recess periods, namely, maturation. The learner 'grows' to a more difficult and complicated task between repetitions. This means that upon attacking the problem again he is able

to construct a more complex perceptual configuration; he perceives the goal and the method of reaching it in a greater detail of relationship." (p,208)

Gesell (12) has also found that the child's development is a process of maturation. A summary of some of his results is given in the following quotation.

"While the positive results of training and conditioning have somewhat obscured the factors of maturation, the limitation of training may be adduced to show the existence of these factors. Such limitations were put to experimental study in the same pair of twins (Twin T and Twin C) whom we have just cited. At the age of 46 weeks, when the thoroughgoing mental and physical identity of the twins had been established, it was decided to determine the influences of training confined to one twin by using an experimental method which we have designated the method of co-twin control. T became the trained twin; C was reserved as a control.

"Very briefly, Twin T was systematically trained for 20 minutes daily over a period of six weeks, in two fields of behavior, stair climbing and cube behavior, including prehension, manipulation and constructive play with a dozen one-inch red cubes. An experimental staircase arrangement of five treads was used, and for ten minutes daily Twin T was put through her paces. At 43 weeks she scaled the stairs for the first time with slight assistance. At the conclusion of the six weeks training period (age one year) she was a relatively expert climber. At that age her untrained Co-twin C would not yet scale the staircase, even with assis-

tance. At the age of 53 weeks, however, when C was again confronted with the staircase, she climbed to the top without any assistance and without any previous training whatsoever. In this sense the form and the efficiency of her pattern of climbing was almost purely a function of the maturation of the appropriate neural counterpart.

Twin C was then given an experimental course of training in stair climbing, two weeks in length. At the end of the period (age 55 weeks) she approached Twin T in her climbing skill. By means of the motion pictures it was possible to make a comparison of the climbing ability of C at 55 weeks (after two weeks of training) with that of T at 52 weeks (after six weeks of training). This comparison introduced an interesting form of relativity into the investigation and brought out the significant fact that although T had been trained three times longer and several weeks earlier, this advantage was more than overcome by the three weeks of C's added age. Again the powerful influence of maturation on infant behavior pattern is made clear. Early training altered slightly the form of the pattern and hastened the acquisition of facility but left no considerable or decisive locomotor advantage in favor of Twin T.

"In the field of cube play the experiment clearly showed that training had no significant effects upon the patterns of prehension, manipulation and constructive exploitation. Although Twin C had enjoyed no special opportunities in the handling of cubes, her cube behavior was fully equal to that

of T after a six weeks training period. The similarity in temporal and spatial details of pattern was confirmed in this case by a time-space analysis of the behavior patterns by means of the cinema record. This does not mean, however, that there were no changes in the patterns of cube behavior during the training period from 46 to 52 weeks. On the contrary, the records, when analyzed, show consistent and incontrovertible weekly increments. Indeed a day by day analysis of the diurnal records of cube behavior satisfied us that there was a daily drift toward progressive changes in the cube performance patterns. These changes were develop mentally achieved by a steady process of decrement and increment rather than by a saltatory or zigzag course. There may be spurts and plateaus and rhythms in the development of other fields of behavior but at this stage of the life cycle there was a relatively constant trend toward daily change. This progressive daily changing apparently occurs by a process of continuous emergence which tends to lift the level of development slowly and steadily as though by tide action rather than by rhythmic spurt. We would explain the resistance of the patterns of cube behavior to the influences of training and conditioning by the fact that these patterns are basically under the stress and the regulation of the intrinsic organic factor of maturation. The very fact that there is a growth trend toward daily change of pattern makes the behavior less susceptible to stereotypy and to conditioning." (pp.313-315)

In the above discussion "The term growth may be construed to embrace the total complex of ontogenetic development. Maturation refers to those phases and products of growth which are wholly or chiefly due to innate or endogenous factors." (p.308) Although it is artificial to press unduly a distinction between intrinsic and extrinsic factors, it must after all be granted that growth is a function of the organism rather than of the environment as such." (p. 318).

Cohill's study (8) of the development of the nervous system and the development of the behavior of the Ambystoma lead him to the following conclusions. "In reality behavior is always in process of development in animals that can learn by experience. When new turns in behavior cease to appear in the life of the individual, its behavior ceases to be intelligent".(p.79). "This potentiality of growth in the functional neurone of Ambystoma has a very definite and specific relation to the development of behaviour. We infer, therefore, that potentiality of growth is a factor in the development of behaviour of other vertebrates in proportion or scope of its occurrence; and that it is in the same proportion a factor in the process of learning, provided learning in its broadest sense connotes development of behaviour". (pp.80-81).

The processes governing this growth of the nervous system and its effect upon the behaviour of the organism

is given in the following quotation from Coghill.

"Nerve cells, like seeds planted by a gardner, spring up and grow according to a definite pattern. This pattern, in the nervous system, is established in its main outlines before nervous function, excitation or exercise begins. It is established, also before vascularization of the nervous system occurs, which Ramón y Cajal holds is an intermediary process between increased nervous function and the growth of nemrones under adult conditions. Nervous functions or exercise, therefore, cannot be either directly or indirectly the cause of growth and differentiation of the nerve cell. This is confirmed by the growth of nerve cells in vitro in normal embryonic fashion. Under these artificial conditions their orientation and direction of growth can be determined by extrinsic agencies. Under natural conditions, also, the path along which they grow seems to be determined by surrounding conditions. Among these conditions, in early periods, as presented in the last lecture, are metabolic gradients of the organism and localized centres of growth or differentiation of nerve cells themselves. During later periods, processes of conduction in established tracts may be one activating factor in directing the growth; vascularization may be another. But in the nerve cell as in the seed, growth as such must be regarded as the expression of an intrinsic potentiality of the cell.

"Futhermore, this potentiality, as shown in the last lecture, is not exhausted when the nerve cell begins to

conduct impulses according to its definitive role. After this the cell continues to grow and seek out new realms to conquer. The functional nerve cell is, then, more than a conducting mechanism, whatever may be involved in conduction. It is from the beginning a dynamic system reacting to its environment after the manner of a living organism. Physiological conduction is, so to speak, its accessory or secondary function. If it ever loses its potentiality of growth and differentiation, we do not know when or where.

"...Growth of the terminals of axones and dendrites through microscopic dimensions is sufficient to have profound effect in behavior. Thus we have demonstrated in the first lecture in a vertebrate of such primitive form as Amblystoma, which by the growth of terminals of nerve cells over a distance of less than one one-hundredth of a millimetre, transforms itself from an animal that must lie helpless where chance places it into one that can explore its environment in response to impulses from within or stimulation from without." (pp. 83-85)

"From the facts related in the first lecture, it is obvious that there are two processes that are operating simultaneously in the development of behavior. The one is expansion of the total pattern as a perfectly integrated unit; the other is the individuation of partial systems which eventually acquire more or less discreteness. In Amblystoma the total pattern first extends through the trunk and tail. As this pattern enlarges, the parts involved are always

perfectly integrated. This totally integrated pattern then extends into the gills, next into the fore limbs and finally into the hind limbs. But as the totally integrated pattern expands through the organism, its parts, one after another, in the same order as they were invaded by the total pattern begin to acquire a measure of individuality of their own; first the gills, then the fore limbs and finally the hind limbs, this means that local reflexes emerge as, in the language of "Gestalt", a 'quality upon a ground'; that is to say, they emerge as a special feature within a diffuse but dominant mechanism of integration of the whole organism. They cannot be regarded as simply the action of a chain of neurones, except in as every link of the chain is conceived to be welded into the organism as a whole.

This principle is thoroughly demonstrated for Amblystoma, a typical vertebrate, and there is nothing in our knowledge of behaviour to indicate that the principle does not prevail universally in vertebrates, including man. There is no direct evidence for the hypothesis that behaviour, in so far as the form of the pattern is concerned is simply a combination or coordination of reflexes. On the contrary, there is conclusive evidence of a dominant organic unity from the beginning. That evidence appears not only in the manner in which behaviour develops, but particularly in the manner in which the nervous system puts the principle into effect, for as shown in the first lecture, the nervous system concerns itself first with the maintenance of the integrity of the

individual, and only later makes provision for local reflexes." (pp. 88-89)

In discussing the mechanism of individuation, Coghill says: "It appears, therefore, that the individuation of a partial pattern or local reflex within the total pattern is anticipated in the central nervous system by the growth of a nervous organization with specific reference to that partial pattern long before the latter makes its appearance in behaviour. The details of this process are still to be determined; but its general nature is obvious." (p. 91)

Coghill discusses at length the mechanism or process by which this individuation of a partial pattern is accomplished but for our purposes we believe that the following quotation will give the information that we want and it will therefore not be necessary for us to go into the details of this aspect of the development of the nervous system.

"Accordingly, the normal experience of the animal with reference to the outside world appears to have nothing specifically to do with the determination of the form into which the behaviour of the animal is cast. On the other hand, experience has much to do with determining when and to what extent the potentiality of behaviour shall rise into action." (p.87)

The work of Carmichael and Bird have indicated that the activity of the achievement of the organism is the end product

of a process of maturation of development and not the causes of the development. For instance, in Carmichael's experiment, the swimming of the embryos was the end product of the maturation process and not its cause. The skill with which the chicks in Bird's experiment obtained food was the resultant of a maturation process. Very little if any improvement came as a result of practice. The rather lengthy quotation from Coghill has shown us the process of maturation as it is found in the Amblystoma. Further quotations (9) could show that the same principles apply to the human fetus that were found to operate in the Amblystoma. The first activities are mass or undifferentiated activities while specific or differentiated activities which acquire more or less discreteness appear as the organism matures. Irwin (13) studied the activities of the human infant during the first ten days of its life when the external stimuli were kept as nearly constant as possible. He found that with a very few exceptions, mass or undifferentiated activity characterized the movements of the infant during this period. The specific or differentiated activities are a later development in the infant's behaviour. These studies all indicate that the maturation of the nervous system correlates very closely with the development of the behavior pattern of the organism. Or to put the same thought in other words, the development of the behaviour of the organism occurs only as the nervous system matures and the nervous system matures only as the behaviour patterns of

organism expand and differentiate. The total organism or the individual is, therefore, the resultant of the maturation process.

Let us stop a moment to see what this discussion means to those of us who are working with college students. The general form of the behaviour pattern of the individual is beyond our control; we can do very little if anything about it. The individual will grow and develop even if we make no attempt to assist him; growth is a part of the general behaviour pattern. On the other hand, however, experience, or the degree and kind of stimulation to which the individual is subjected "has much to do with determining when and to what extent the potentiality of the behaviour shall rise into action." In other words, at the college level, stimulation seems to be the most important condition of maturation. When we say most important, however, we do not imply that it is the only condition or that it can be isolated from the other conditions. All of the conditions are a part of an integrated whole and in a way no one can be more important than any or all of the others. But for the purposes of study we shall logically isolate these factors and consider their effect upon maturation. Of course the individual must be in good physical and emotional condition and he must have favorable working conditions such as good lighting, good ventilation, proper heating, etc., but in addition to these conditions it is

well known that college work must be adjusted to the level of maturation reached by the individual. This condition and its importance is well illustrated in Gesell's experiment with the twins (12). The goal toward which the individual is reacting must be definite enough to allow effectual learning. (26); the individual must know the results that he is obtaining in his work (4); work and rest periods must be properly spaced to avoid irradiation patterns (18,22, 23) and the individual must use effective methods of study. While all of these conditions are important and have been recognized for some time we believe that pacing the student's activities is one of the important conditions that has not been emphasized sufficiently.

Wheeler (26) defines pacing in the following terms:
3-----"At present we shall think of pacing as gradually giving the child more and more complex tasks to perform, as he grows and matures. The increase in stimulation and in difficulty of problems should not at any time be faster than the child's rate of maturation, otherwise repeated failures to master the tasks at hand are induced. Too frequent failures lead the child to develop undesirable habits of work and unhealthy emotional attitudes. Once he masters a task of a given difficulty, he should not be presented with another and more difficult task until a recess period has elapsed during which he may have time to grow to the more difficult situation. Theoretically if the degree of stimulation is adequately controlled, the child should be able perfectly and easily to

solve each new problem the first time it is attacked. When he must resort to 'trial and error' or to a random procedure it is evident that he is not ready for the problem and that the conditions under which he is being forced to learn are not adequately controlled." (p. 115).

Pacing therefore is the process which keeps the student "on his toes", the process which keeps the student working at his best and the process which causes him to mature as rapidly as is consistent with substantial growth. It is the process which avoids the extreme or overstimulation and understimulation, but which does allow for moderate stimulation "which if properly controlled leads to a steady normal development of intelligence."

In view of the above discussion how shall we explain the difference in the achievement of the upper group in the college when compared on the basis of gains made on retests with intelligence test and the increase in the size of the average grade point? Recall that the group with the highest initial scores in Baldwin's study made the greatest gains on the retest. The groups showing the highest initial scores in this study, whether we consider scores on psychological examinations or average grade points for the first semester, are the only groups that show a large and more or less consistent drop from their original starting point. Recall also that the curves drawn from the gains made by the middle or central groups in both studies are quite similar. On the other hand the lowest group in this present study made gains that are

quite comparable with the gains made by the highest group in Baldwin's study. Can all of these facts be explained on the same basis or must a variety of factors be considered? We are of the opinion that there is more similarity in these results than is apparent at the first glance. We believe that these differences can be explained largely on the basis of the difference in the kind and degree of stimulation received by these different groups. The upper group grows and develops during their stay at the university as is evident by the large gains made in the retests with intelligence tests. yet the work of the classroom does not challenge them to do their best. Their achievement while consistently higher than that of any of the other groups is much lower than they are capable of doing if we consider the grade points that they made during the first semester and the gains that they made in the retests with psychological examinations as evidence of the achievement which it is possible for them to attain. The upper group has the ability to participate in the varied social and extra-curricular activities and at the same time maintain a respectable record in the classroom. We know that the better students ordinarily read much more rapidly and comprehend more of what they read than do the poorer students. This ability allows the upper group to read their class - assignments and grasp the essentials much more readily than do the lower group. The upper group can therefore spend part of its time reading magazines, newspapers, and books while the lower group is still struggling with the class assignments.

The better students are also the students who participate in extra-curricular activities such as music, glee club, band, dramatics, work on the Joyhawk and K book, Y.M.C.A. and Y.W.C.A., committee work on various campus activities, etc. The lower groups cannot do this type of work and at the same time maintain "respectable" grade in their class work; they are unable to function effectually in such a variety of activities. Consequently they confine their activities to the classroom which in many ways offers less strenuous competition than do the social and extra-curricular activities. The wider and more differentiated contacts of the upper group allows them to make better scores on the psychological examinations which require a more general knowledge and ability than does classroom work, while the students who have limited their study to the classroom work usually have a more detailed knowledge of the material covered in class and consequently are usually able to make a relatively better showing in grades than do the upper group which has participated in a much wider variety of activities. This more intense and diversified stimulation received by the upper group no doubt partially explains their more rapid growth which is evidenced by gains on the retests with intelligence tests, just as the more intense and diversified social stimulation of the city child causes it to grow more rapidly socially than does the isolated rural child. On the other hand, however, the nervous system of the upper group are probably able to mature and differentiate more rapidly and to a greater extent than the

nervous systems of the lower group.

The classroom, on the other hand, seems to be very stimulating to the lower groups and they make gains which are much greater than those they made in the retests with intelligence tests. If we may use an analogy, we might compare them to flowers grown in the open and flowers grown under the controlled conditions of the greenhouse. In the free give and take of the university social and extra-curricular activities, the competition is too stiff and the lower groups does not make as great gains as do the other groups, if the retests with intelligence tests can be considered to measure this growth. The controlled conditions of the classroom, however, seem to be especially conducive to the growth of the lower group as measured by the increase in the size of the average grade points and they make a growth which is greater than that made by any of the other groups. These facts seem to indicate that our university system, at least that of the College of Liberal Arts, is better adapted to the needs of the lower group than it is to the needs of the better college students.

The gains made by the average or middle groups are about the same in grade points as they are in the retests with psychological examinations. This would seem to indicate that the university is offering them a "balanced ration" and that their development is more symmetrical than that of

either of the other two groups, those above and those below. Which group's needs the university is meeting best might be a debatable question, but certainly all would agree that the more intelligent or the upper group is the group that is least challenged by our present education system. Yet they should be the group which is stimulated the most for they will be the leaders of tomorrow. What can be done to meet their needs is still a debated question which is receiving the serious consideration of the administrators and educators of this country. Some aspects of this question will be considered in the next section.

VII

EDUCATION AND THE MATURATION PROCESS

One of the newer developments in university and college administration is what is known as "student personnel work". This term has different connotations at different universities. At Northwestern University (17) where this type of work is as well developed as it is in any university in this country, the work of the Department of Student Personnel includes the following: (1) the selecting of students to enter the university, (2) assisting the freshmen to make their adjustments to university life, (3) counseling with the students about their future vocations and careers, (6) maintaining an employment office for the placement of part-time and graduating students, (7) counseling with students about mental hygiene problems, (8) making surveys within the university, (9) making studies of the problems involved in differences, (10) but primarily the department attempts to coordinate all agencies concerned in personnel work.

Last fall we attempted in a small way to do some of this type of work here at the university. In the close intimate contacts with students which is necessary for effectual personnel work, the process of maturation can be observed much more easily than it can be in a large group or even in classroom work, and for that reason we shall discuss a few cases to indicate the nature of the problems met in this type of work, and the process followed by the student in reaching solutions for their problems.

The following is L.W's. story as he told it to the writer in October. He started with his present problem and worked back to his childhood, but the account commences with his boyhood and brings the story up to the present time. A few additional facts will be gathered from other sources.

L.W's. father is a very brilliant college professor who has made several original contributions to the subject which he teaches. His mother had only a high school education, but the family assumed that all of the children would go through college. All of his brothers went through the university; one of them is now teaching at a large eastern school.

L.W. made average and below average grades in high school. When he graduated, his father, despite the assumption that all the children would go through college, suggested that he stay out of school a couple of years to see if he couldn't find a life vocation that would be satisfactory. L.W. did not follow his advice but entered the engineering school the following fall. He roomed with a group who were very much interested in geology; he caught their enthusiasm and shifted to the college after three semesters in the engineering school. L.W's. father again suggested that he stay out of school a couple of years and work at various types of occupation to see if he could find a vocation that would be satisfactory. Again L.W. disregarded his father's advice and made the shift. Shortly after this shift, he left school because of sickness.

Ever since L.W. was about 20 years of age he has been interested in aviation. His family, however, did not approve of this interest; they did not openly oppose the interest but they did nothing to encourage it. When L.W. left school he turned to aviation as a vocation. The business depression of 1929-1930 affected the aviation industry and in the reduction of the number of employees, L.W. lost his job. He came back to Lawrence during the summer of 1930. His friends in geology were just about ready to start on an expedition to Mexico and he was persuaded to go with them. He enjoyed this work with his friends very much and when he came back in the fall, they persuaded him to go on with his college work. L.W. has not depended on his parents for money for some time though his parents are able to finance his school work and would gladly do so if L.W. would agree. L.W. respects and admires his father and seeks his father's advice, but still he prefers to pay his own expenses. L.W. therefore took only eight hours of college work and spent the remainder of his time making money enough to meet his expenses. Five of the eight hours of college work was Spanish, and difficulty in this subject was the thing that brought L.W. into our office. He said that he had difficulty getting and remembering details. L.W. is a conscientious student and had really tried to get his Spanish. This difficulty therefore was not one of attitude of effort.

L.W. seemed to be in a very happy mood when he came to

the office the following Monday afternoon. He said that he had made his decision and that he was going to quit school. There was no advantage in trying to "kid" himself along any further. Even if he made passing grades this semester, he would have the same difficulties to face every semester that he stayed in school. He was not "cut out" for this type of work. When he lost his job last summer, he came to Lawrence because his friends were here. They had persuaded him to accompany them on the trip to Mexico; they had persuaded him to enter school in the fall. His friends were very much interested in the work they were doing and they could not understand why he should not be interested in the same type of work. He had caught their enthusiasm and had entered the college. However, since the discussion last Friday, he had given considerable thought to the problem and could now see that he would not be satisfied with that type of life work. As long as he was here, he might be reasonably satisfied for all his friends were here but if he shifted to another university, he knew that he would not be satisfied.

He said that he probably would not have reached a satisfactory solution to his problem if we had not discussed it from all viewpoints. A long talk with the Dean would not have accomplished the same results for the Dean could not have given the necessary time and the whole atmosphere of his office would have urged a continuation of college work while an unbiased discussion of all aspects of the question caused him to see that he should give up college work.

L.W. seemed very happy that he had satisfactorily solved his problem. He was now going back into the type of work which he has always wanted to follow, yet a vocation in which his family have always more or less discouraged him, i. e., aviation. He went in to see the Dean and withdrew from school. When we say him several months later, he was as happy as any person could be. Almost immediately he started telling of some of the newer developments in aviation. In this field he is a dynamic individual while in the college class-work he was discouraged, maladjusted and feeling that life was hardly worth the struggle.

Let us examine this case in the light of our previous discussion of maturation,

Any attempt to assist L.W. solve his problems must recognize that he is the center of a dynamic configuration of forces which evolves as a whole or integrated unit. His whole past, present, and future is an integrated unit and any attempt to understand any aspect of his personality must consider all aspects, past, present and future, for it is impossible to understand thoroughly any phase without understanding all phases. He is not the sum of so many experiences, but an integrated, unified organism which stands out over and above any particular experience or aspect of his personality. Therefore the first step in assisting him resolve his difficulties is to get a cross section and a longitudinal view of this configuration of forces. The cross section view will

consider his family life, social life, recreational, vocational, and extra-curricular activities, his religious life, his classroom activities, his intimate and casual acquaintances, his emotional life, etc. In fact any information that will throw light upon L.W's present condition is valuable. Let him tell his story in his own way for in this way you will get a glimpse into his life and personality that can be gotten in no other way. While getting a cross section view, many clues that will help to understand how he came to be as he is will also be discovered. Influences and experiences that have long since passed will come into prominence and your understanding of him and his problems will be expanded. Future plans, ambitions, ideals, etc. will make their appearance. However, in evaluating and in assisting him to evaluate this data, remember that he is not the sum of so many experiences; he is a configuration of forces and the behavior pattern of this configuration will determine the resultant of the various experiences.

This same configuration on the other hand, will determine what response he will make to the situations in which he finds himself. He reacts as a total organism; all of his behavior is unified. It is true that we speak of emotional behavior intelligent behavior, etc., but these are only aspects of the behavior of the entire organism and these parts members or aspects of the total organism are governed by the configuration of the total situation.

Too frequently in the past we have tried to see a problem, in Spanish, for instance, as a discrete problem by itself, but this cannot be done. It is true that when L.W. first came to see me, he saw his problem as a problem of getting Spanish. Under these conditions, however, the counselor must assist the student to expand and differentiate the goal or problem toward which he is reacting. The counselor must assist him to see that this particular problem is part of a larger configuration. Sometimes the problem is a question of clashing personalities, sometimes it is due to faulty methods of study on the part of the student or to faulty methods of teaching on the part of the teacher, sometime, and this is what usually happened, the cause is found in a combination of these and many other factors, but whatever the problem, the student must be assisted to see his problem as a part of the larger configuration. Sometime this can be done quickly, sometimes it takes years and sometimes it is never accomplished. The student must also be assisted to differentiate the problem into its various aspects, and to see these aspects in their dynamic relationships to the total situation. For instance, in the Spanish problem which L.W. presented, what actually caused the problem: was it a lack of a background in grammar, was it difficulty in pronunciation, was it inadequate methods of study, or was it a combination of these and other factors? In other words, what details and relationships do we need before we can arrive at an adequate solution? It

is true that the problem is first seen or perceived in its more general aspects but the student must be assisted to see it in its differentiated aspect. This process of expanding and differentiating the goals toward which the organism reacts is the process of development and development occurs only as the organism matures.

In this case and in all others where the problem under consideration or the goal toward which the organism is reacting is the individual's own problem he is actively striving to solve the problem. Learning is always an active process. Sometimes a question helps the student to expand or differentiate the problem, sometimes it is additional information which the counselor must supply but under no circumstances does the counselor have to supply the motivation. The solving of the problem is its own reward. No artificial stimuli such as grade, honor, prizes, etc., are needed to get the student to work toward a solution. In fact, the insertion of some of these factors may narrow the goal toward a solution. In fact the shallowness or lack of real significance of the goal to the individual frequently causes him to resort to such practices as cribbing, "parroting", cheating, etc. without any qualms of conscience. For instance, the following situation recently came to our attention. A certain student was pledged to a fraternity which required that he make a certain average grade during the first semester or he could not be initiated into the fraternity. Near the end of

the semester, he found that his average grade in a subject which he disliked but which was required to fill a group requirement was very low. The lowering of this grade from a C to a D would prevent him from being initiated into his chosen fraternity. The day of the examination came and it is not difficult to imagine what happened; he cheated in the examination but he was initiated into the fraternity. Many other examples of this same type of thing could be given. Problems are copied and handed in as the individual's own work. Themes are written by a fraternity brother or a sorority sister. This type of achievement is the result of our educational system and the methods followed. This system also makes "shot gun quizzes" and other artificial stimuli necessary in college work. In fact we know of one university instructor who has a standing rule that any one who is called upon to recite and doesn't know his lesson must leave the room immediately.

Frequently the students find themselves in classes where the teacher is the autocrat. The student must do all of his work exactly as the teacher instructs or he does not receive any credit for the course. Since the student must have the credit in order to graduate, he makes the getting of grades his main goal; the question of real achievement or development is side tracked. For instance, the students in these classes soon find that the instructor demands that definitions be given in certain words; the questions must be

answered in a certain manner, frequently this amounts to a parrot repeating of the lectures the instructor has given during the term; the students do not dare question, much less contradict statements and viewpoints expressed by the instructor. We could go on and describe this instructor more in detail but you already recognize him; he is quite common in our educational system.

Under these conditions, what does the student do? He can do only one of two things. He can do the work in the way required by the instructor or he can take a low grade or fail in the course. He cannot afford to fail in the course so he does the next best thing. He does the work required by the instructor, crams for the examinations, and immediately proceeds to forget all that he had in the course. How frequently have you heard the statement, "If I get out of this course, I hope that I never hear that subject mentioned again."

If the conditions mentioned above were the exception, then there would be no point in mentioning them in this connection but in many ways they are the usual rather than the unusual way of doing things. The statement is often made and we think justly made that the university teaching is the poorest of any in the entire educational system from the kindergarten through the graduate school. The reason for this statement is fairly obvious; in the lower grades the subject matter itself is not differentiated enough to require much effort on the part of the teacher to master the

subject. She therefore spends her time in assisting the child to grow and develop. The child is the center of attention; emphasis is placed upon his growth and development. Subject matter and the school routine therefore gravitate to their proper place as means to an end. This condition is not universal by any means but is found more frequently in the public school than it is in the universities.

In the universities all too frequently the emphasis is upon subject matter. The instructor's promotions and increase in salaries come more frequently as a result of the publication of research work than they do because of the development of the students which he has taught. Study is fascinating to the instructor or he probably wouldn't be teaching in the university. Recognition comes most rapidly by research in his subject matter and naturally this is the main point of emphasis. The student's development may be twisted, stunted, or gnarled but the subject matter must not be mistreated.

Our studies have indicated that the student first reacts to any subject in a relatively undifferentiated manner and as he develops in this subject, he expands and differentiates his reactions to the subject. Life as a whole is also seen in this manner. For that reason many of the colleges and universities are introducing orientation courses as a means of assisting the student to see what the university

work is "all about". in other words, since the college student can only see the work of the various fields in a relatively undifferentiated manner, why not assist him to get as good an understanding of the entire field as is possible. Give him a "bird's eye view" of the various sciences and humanities taught at the university.

Almost the first reaction that you get from the instructors who are specialists in these various fields, however, is that the work given in a course like that is not a fair representation of their science. The instructor in history will say that history cannot be taught that way. History must be differentiated from sociology, from economics, and from psychology. Each subject has its own special viewpoint and special methods and for that reason it is impossible to give a general course which will cover all of these subjects. History must be taught as a separate course, economics as a separate course, psychology as a separate course and the students will somehow or other get a general view of all of the social sciences. The student must coordinate these subjects by himself, for the university make little or no attempt to assist the student to get a general view of the whole field of social sciences. The instructor, in this process, wants to go from the specific to the general, from the part to the whole. He has, however, forgotten that he did not learn history by adding facts together. He first secured a general idea of the history of

the country he teaches and then gradually differentiated the details and their relationships out of this larger whole or configuration. At the present time he has expanded and differentiated his reactions to the subject under consideration and he sees details in relation to the entire field of social science. His response is a configurational response to the entire field.

But what about the student? We have seen that he also learns bit by bit, precept upon precept; he goes from the whole to the part. He first reacts in a relatively undifferentiated manner to a total situation of one kind or another. He develops by a process of individuation. He must start with the subject as a whole and then proceed to expand and differentiate it into its various aspects. This means that the student should spend his first year or two in college getting a broad survey at the college level of the entire field of human knowledge and then gradually as his insight into the subject increases he will secure and appreciate more and more the minute and detail technicalities of the subject which he chooses as his major field.

The university curriculum, however, is not based upon these assumptions. It assumes that the student learns bit by bit; it assumes that the student should spend a few hours each week learning the details and technicalities of a foreign language, of a social science, of mathematics, of a biological science, of literature, etc. In other words

the student should study in detail a part of about seven or eight general fields and then be expected to have a general knowledge of the meaning, value and relationships existing between the various fields of knowledge. Yet under this system, students meet certain principles in sociology and never recognize them in physics; they meet certain other principles in mathematics and never recognize them in biology. Very very few students ever see these separate logical divisions of the field of knowledge of a part of a larger configuration, it is usually in spite of the university education system rather than because of anything the university did when they do. Consider the student's understanding of a single field of knowledge. Most students study the arithmetic taught in the grade school, "take" algebra and geometry in the high school and then frequently "take" algebra in college without appreciating the romance of mathematics. They never "see the woods because of the trees". They do not appreciate how the system of mathematics arose; they do not understand its relation to language, music, philosophy, chemistry, etc. The instructors "rave", plead, scold, and wonder why the students do not get mathematics; they do not understand why the student considers "just passing" as a respectable grade".

Why is the three year old child a veritable question mark, the ten year old child bubbling over with enthusiasm about what he is doing, what he is making or what he has

while the average college freshman is a dull lifeless student who must be driven to his tasks and is satisfied if he "gets by". Why? The child of three is allowed to express his spontaneity and enthusiasm. His questions arise out of his activities; they appear as he differentiates the various aspects out of the total situation. When he enters school, however, the situation changes. Instead of the problems arising spontaneously out of his experiences, they are now handed down to him by his teacher who represents an adult world. Frequently the problems have little or no significance to the student, but to most educators that is a matter of little import. The problems have meaning and significance to the adult and to the adult's life and that seems to all that is important. By the time the student reaches college, the educational system is primarily a thing to be "taken", but one which should be gotten through with as quickly as possible. The student's enthusiasm and spontaneity is expressed in the social and extra-curricular activities which have meaning and value to him. In other words the value received by the student from our educational system seems to come in spite of the system and its methods and not because of their efficacy. This difference between the viewpoint of the university instructor and the student he is trying to instruct cause the difficulties which we have mentioned. Only as the college and university administration and the college faculties see the process by which the students

matured can these undesirable features of our present university life be removed. Only by following the process of maturation can the student have goals which have real significant meaning to him. If the student has matured sufficiently for him to have insight into the problems presented and if these problems are considered as he naturally meets them in his development, artificial stimuli are never necessary and the student never resorts to cheating, "parroting", and similar practices. Students who come to the counselor with their problems never have to be motivated by artificial stimulation. The achievement of the solution of the problem is its own reward.

The application to group work of the principles brought out in our discussion of the problem of maturation is a little more difficult than applying them to the individual's problems. However, it can and has been done. The application can be shown by some class work that the writer supervised several years ago. The class was a part of a church school in a small town of about 1300 population where this church was the predominant religious organization in the community. The class was composed of about eight girls who were above the average in their school work. The class's psychological examination record also placed them above the average. They were all in the junior class of the local high school. Near the end of the school year, the question of the junior-senior banquet came up for discussion in one of their class meetings. At that time the majority of the group decided to carry out the banquet in a particular manner. The minority

were very much dissatisfied with this decision and discussed the question privately with a large portion of the class. The question was again discussed in class meeting and the side that had formerly been in the minority now was in the majority. The question of whether the minority should have attempted to get the original decision changed was therefore the dominant question the following Sunday when the class met. The class was about evenly divided on the question.

Probably before we proceed further we should mention something concerning the methods followed in this class. The girls' training and experience had been quite similar and consequently their viewpoints and problems were quite similar. This group was therefore selected for an experiment in a new type of class work. The girls determined their own course of study. The work was so organized that there was a continuity in the work but the lesson material grew out of the girls' own problems. For instance, in the problem mentioned above, i.e. the rights and prerogatives of the majority and minority, the problem was analyzed and discussed for several Sundays until the girls were satisfied with the solution reached by the class.

This problem grew out of the social environment in which these girls lived. In this case, the teacher was familiar with the history of each of the girls. He knew the type of home from which the girls came. The life of the community for the past several years was known. The school system which these girls attended was well known. In other words, the teacher

could trace the evolution or emergence of this problem in the life of the girls over a period of years. With this background the problem was brought up for discussion. There was no need for any artificial stimulation or reward of any kind necessary to get these girls to hunt for a satisfactory solution to the problem. It had arisen in their life as a natural development and they had matured sufficiently to discuss the problem as their problem when they brought it up in class. When it was first brought up in class the girls saw the problem almost wholly as a question of getting their way about the junior-senior banquet. The teacher's job therefore took on a two-fold nature. (1) He must assist them to expand the problem until they saw it in the broader aspects. At first it was expanded so that they saw the problem as it was found in their class activities, i.e., what right and duties have the minority and majority as members of a larger social unit. The problem was then expanded into one that was found in all of their social activities, in the community activities, in the state, nation and finally as an international problem. The problem of getting them to expand their conception, however, was only part of the problem. (2) They must also differentiate this problem into its detail aspects and their relationship in the total situation. Since the class realized that this problem first arose in the class activities all of the detail aspect of the problem as it was found in this situation was discussed. The details of the problem as

it was found in their social and church activities were also discussed. The discussion of its application to the problems of the community was less detailed and by the time the problem of international relations was reached, only the broader aspects were discussed. The discussion of this problem extended over several class periods.

The greatest objection raised to this method by other members of the church school was that it did not teach the girls anything. In other words, they had no textbook; they were not required to read so many pages of material before each session and if learning is measured by the amount of pages read, then the girls did not learn anything. On the other hand, if learning is to be considered in its broader aspects as the development of behavior, then the girls did learn and learn quite rapidly. The girls were sufficiently matured to appreciate the problems; it was their problem and these two facts provided all the motivation that was necessary to get the girls to work for a solution. The entire organism or individual was involved and the problem was discussed as a part of the social situation out of which it evolved. The religious, social, emotional, vocational, and educational aspects of the problem were discussed by the group. If the girls did not have the necessary information to solve their problem they, of course, went to other sources of information. The reading was not done as an assignment; however, it was a necessary step in the solution of their problem and as a result was performed just as enthusiastically.

cally as any part of their class discussion. The group not only saw these problems in their broader or more general aspects but they discussed the differentiated and detail aspects as well. In other words, the group in their learning or social and educational development were following the processes that we found are followed by the organism in its development.

Several of the universities of this country are attempting to apply these principles to their problems. Wisconsin for several years has had an experimental college in which these principles are being tested. The University of Chicago has inaugurated a plan which places emphasis upon achievement instead of such artificial goals as grades, hours of credit, class attendance, etc. The students are assisted to see the problem as a whole and to expand and differentiate it into various aspects just as rapidly as they can. The test of the students maturation or development is not grades and hours of credit but achievement; if the individual can show that his achievement at the end of two or three years is worthy of the Bachelor of Arts degree, he gets the degree irrespective of the number of hours credit he has received. Harvard has also recognized that our present system is too artificial and places too much emphasis upon goals which should be considered as means to an end instead of being the end. They are therefore attempting to introduce their tutorial plan which places a few students under the supervision of

an instructor. Some of the schools are recognizing that there is a difference in the kind and degree of stimulation required for students with different abilities; they are, therefore, experimenting with problem of dividing or sectioning classes according to the ability of the student. Some public school systems make this division throughout their entire system, while others are limiting it to special classes for defective or handicapped students. Many schools are experimenting with these principles in their attempts to use the project method of teaching. Under this system the project emerges out of the social activities of the group. It is accepted by them as a worthy project and they work out their solution to the problem with the assistance of their teachers.

Antioch College, Case School of Applied Science and a few others are experimenting with the possibility of having the students work in the classroom or laboratory for five to nine weeks and then transferring him to a job in industry or into actual work in the vocation which they are preparing to follow. Many educators have recognized that the student's development is determined by the conditions found within the university. When the student transfers into business and professional life, he must again adjust himself to a social order that in many ways differs radically from that found at the university. These educators are trying to assist the student to gradually expand the configuration of which he is a part so that he will react more and more to this larger

configuration instead of to the narrow configuration found in the college life.

The life of the average high school student is quite different from that of the university student. Some of these high school students should never attempt college life, but how are they to know whether they should go to college or not? College and university authorities have painted glorious pictures of what is to be gotten at the university. The student is seldom given accurate information concerning the every day activities of college life. On the basis of this one sided and brilliantly colored picture, the student or his parents decide that he should come to college. Let me show you the picture as it is seen time and again in the office of the student counselor.

Herman had not planned on going to college when he was in high school, but a few weeks before school started, his mother suggested that he go to the university and he had complied with her request. However, at no time had he particularly wanted to come. He had been at the university about six or seven weeks when we first saw him. By this time he was thoroughly disgusted with college work. The most disagreeable work that he had ever done before was to work in a "dirty, greasy, foundry job", but his college work was much more disagreeable than that job. Herman, however suggested that this feeling probably was due to the fact that "he did not see what it was all about" and consequently

was doing poor work. He had had difficulty with his algebra before and the Dean had allowed him to substitute botany for algebra. He was enjoying this course fairly well for he could "get it". He also liked R.O.T.C. Herman had never taken any foreign language in high school. He was, therefore having difficulty with Spanish, didn't like it, and didn't see how it was going to be of any value to him.

Herman was a sincere conscientious student but just "couldn't see what it was all about". The general behavior pattern of his nervous system did not at this time allow him to do the type of work required at the university. He had managed to get through high school with average or slightly below average grades but when he came to the university, he just couldn't get the work; it had no significance and meaning for him. He could hardly bear the thoughts of giving up and going home as a failure but what was he going to do?

How many times have we heard that statement, "I can hardly bear the thoughts of giving up and going home as a failure but what am I going to do?" This problem was the boy's problem and yet it wasn't his problem. His parents had never gone to university. They did not know what was required of a student at the university. The universities authorities of the country and the press had published glowing pictures of university life and yet when Herman reached the university, he found himself in a situation which he could not understand. Universities have been run on the basis that the student

enrollment, the university budget and the number of buildings and the size of the college endowment should get larger and larger year by year. Frequently and usually these things are necessary but the point that we are raising is that these considerations have become ends in themselves and not means to an end. Some of the universities are recognizing that all of these conditions are only means to an end. They recognize that all students can not effectually spend four years in a university. The university authorities are therefore giving the student information while he is yet in high school that will help make the correct decision. Where placement tests or any other kind of tests are available that will help the student decide whether he should go to college these tests are given while he is in high school. In other words, these educators recognize that the problem arises while the student is yet in high school and that is the time to assist the student. Help him meet the problem when it arises and give him information that will allow him to correctly expand and differentiate the goals toward which he should work.

After the student arrives at the university, an attempt is made in the form of "Freshman Week" to assist him get a "bird's eye view " of what university work is going to be like. The university authorities know that his first reactions are going to be toward a relatively undifferentiated total situation and they are assisting him to make this adjustment as intelligently as possible. Too frequently, how-

ever, this adjustment is seen only as a get together meeting to assist the freshman to become better acquainted with the campus organizations and activities rather than an attempt to assist him to adjust to the fundamental purposes and ideals of university life. The fact that most of the upper-classmen have not returned to the university, simplifies the adjustment considerably. The freshman is among freshman and this makes his adjustment much easier than it would be if he were suddenly placed in the full swing of university life without any assistance to make the adjustment from his home life to the complicated life of the university community.

The brief resume of a few of the experiences which have been initiated in an attempt to differentiate this general viewpoint into its various parts or aspects by no means indicates the full possibilities or the pregnancy of this viewpoint. Psychologists and educators are just beginning to appreciate its significance. Many of the details, therefore, remain yet a part of the unknown, but we believe that enough is known to indicate the general nature of the process.

The individual or the human organism is more than the sum of variety of experiences. It is an integral or whole which possesses properties or qualities which the parts do not have as isolated entities. Education must therefore deal with the whole man as a configuration of forces which governs the activities of its members. The human organism in turn is not an isolated being, but is a part of a larger configuration of forces which governs the activities of its members. This

larger configuration of which the human organism is an integral part evolves or emerges from one type of behavior to another as a unified whole by the continuous process of expansion and differentiation. Education should therefore assist the students to meet adequately the problems which emerge out of the activities and experiences of the social groups to which they belong. Facts, books, educational systems, churches, buildings, various types of equipment, etc., are means to an end and that end is to assist the students to expand and differentiate their reactions to the problems and goals of life. Education is not a preparation for life; it is life.

SUMMARY AND CONCLUSION

(1) This study is an attempt to learn more about the maturation or growth curve of college students as it is revealed by the average grade points that were made semester by semester during the four years college life of 270 graduates of the University of Kansas, 100 from the School of Engineering and Architecture and 170 from the College of Liberal Arts.

(2) All undergraduate students who are entering the University for the first time are given psychological examinations. On the basis of their scores on these examinations they are divided into ten equal groups or deciles. Almost half of the graduates, however are found in the upper third of the psychological examination grouping. This indicate that only the more brilliant or more intellectual students graduate from the University.

(3) The average grade point of the groups studied increases in size during the eight semesters. This rise in grade points is due to the growth or maturation of the students. The students meet the situations in which they find themselves more and more intelligently which means that they are growing in intelligence. The curve of maturation plotted from the rise in grade points during the eight semesters is almost identical with the curve of maturation obtained by Dr. Baldwin when he retested college students with the National Council Intelligence tests. The groups retested at two state

penal institutions, however, lost 6.37 points on the Army Alpha test in a year's time. These facts indicate that at the college level the kind and degree of stimulation very materially affects the maturation of the students.

(4) The average grade point for all of the groups drops during the third semester, which is the low point for the eight semesters. This drop is most noticeable among the engineers where the third semester's work is very much more difficult than is the second semester's work. However, this third semester seems to be a period of social development or maturation which results in a lower achievement as measured by the average grade point. The fact that students do or do not belong to fraternities or sororities does not seem to have any effect upon this slump. From 37% to 50 % of the students do not slump, but the drop of the remainder is sufficient to cause the curve of the entire group to dip. The standard deviation of the grade points is much greater the sophomore year and especially the third semester than it is any other semester.

(5) The average grade point for the entire group is higher for the spring semester than it is for the fall semester. No doubt a part of this difference is due to the fact that the fall semester has so many interruptions such as football games, Christmas vacation, etc. which the spring semester does not have. But on the other hand, much of this rise is due to the fact that the student has "extended his insight into a given situation and has increased the complexity

of his reactions." This always produces a higher type of achievement which in this case is recognized by the higher average grade points. The studies that have been made by Knight, Rugg, and Shen indicate that neither this rise nor the general rise during the eight semesters can be explained by the instructor's familiarity with the students.

(6) The lower decile groups whether classified on the basis of psychological examination or initial average grade points make a greater and more consistent improvement in average grade points relative to the average grade points of the entire group as a norm than do the higher decile groups, while the upper groups more or less consistently lowered their relative position in comparison with the average grade points of the entire group as a norm. Dr. Baldwin, on the other hand, found that the upper group made the greatest gain on retests with intelligence tests. This indicates that the classroom work of the university does not offer the challenge to the upper groups that it does to the lower groups. The upper groups, however, participate more widely in the social and extra-curricular activities of the university and this greater and more diversified stimulation allows them to make a greater growth than do the lower groups when measured by the scores on psychological examinations. In the narrower and more controlled conditions of the classroom as measured by the average grade points, the lower groups make the greatest growth. The gains made by the middle groups are about the

same in grade points as they are in the retests with the intelligence tests. This would seem to indicate that the university is offering them a "balanced ration" and that their development is more symmetrical than that of either of the two other groups.

(7) If the 100 graduates are to be taken as typical of the distribution between boys and girls then the boys who graduate from the university are on the whole more intelligent than the girls who graduate. However, the classroom activities are more stimulating to the girls and they make a greater growth than do the boys, but the boys throughout practically the entire four years maintain a higher average grade point than do the girls. This you will note is entirely in agreement with the conclusions drawn concerning the growth of the upper and lower groups which is summarized in the above paragraph.

(8) When a homogeneous group of boys and girls are selected, there are no significant sex differences. The girls on the whole, however, do maintain an average grade point that is slightly higher than that of the boys.

(9) An analysis of the various factors which might affect grades such as the student's familiarity with "readers" and instructors, the instructor's acquaintance or friendship with the students, upperclassmen competing with underclassmen, and the student's interest in his major department indicates that none of these factors can explain the increase in the

size of the average grade points. The same curve of development occurs when retests with intelligence tests, which are not affected by the above mentioned factors, are used as instruments of measurement.

(10) Intelligence behavior is always in the process of development. This development occurs only as the nervous system matures and the nervous system matures only as the behavior pattern of the organism expands and differentiates. The total organism or the individual is therefore, the resultant of the maturation process.

(11) Education must consider the human organism as a configuration of forces which in turn is a part of a larger configuration which governs the activities of its members. It must assist the student to meet adequately the problems which emerge out of the activities and experiences of the social groups to which they belong. Facts, books, educational systems, churches, buildings, various types of equipment, etc. are means to an end and that end is to assist the student to expand and differentiate their reactions to the problems and goals of life. Education is not a preparation for life; it is life.

(12) This study, no doubt, has raised more questions than it has solved, but it has at least indicated that the changes that occur during the four years of college are changes which are produced by the growth process and if we wish to understand them more thoroughly, we must investigate the factors or conditions which determine the growth process.

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Appendix A

The Average Grade Points by Semesters of 100 Graduates of the School of Engineering and Architecture.

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
E.A.	2	2.37	2.29	2.33	2.06	2.09	2.61	2.18	2.33
A.A.	7	1.19	1.71	1.39	1.72	1.89	2.29	1.63	2.62
L.A.	1	1.46	0.88	1.19	0.66	1.40	1.56	1.56	1.52
R.A.	3	1.00	0.00	0.17	0.39	1.25	1.00	0.18	0.73
H.B.	3	1.31	1.50	2.16	0.90	1.40	1.82	1.94	1.90
J.B.	1	1.50	1.12	-.83	0.87	0.17	0.57	0.27	0.93
E.B.	1	0.50	0.83	0.87	1.97	1.15	1.10	0.64	0.73
J.J.B.	6	1.00	0.93	0.89	0.21	0.37	1.28	1.35	1.30
R.B.	3	1.94	2.06	1.41	2.22	1.78	1.06	1.67	1.22
W.B.	4	1.56	0.94	1.00	0.64	1.34	1.56	0.74	1.13
J.R.B.	7	1.53	1.00	0.64	0.79	0.69	0.89	-.11	1.39
A.B.	6	1.00	1.33	0.59	-.26	-.81	0.63	0.48	1.05
G.B.	6	1.00	1.97	1.50	0.03	1.80	0.53	0.88	1.44
H.B.	7	0.76	0.74	0.46	0.41	0.69	0.24	1.61	1.00
L.B.	1	1.82	2.88	1.70	1.39	1.88	1.54	2.21	2.00
R.B.	4	1.80	1.58	0.77	1.42	0.28	0.33	0.10	1.38
W.B.	3	2.65	1.94	1.95	1.00	1.60	1.60	1.25	1.99
A.B.	3	1.25	0.50	-.08	0.58	0.99	1.49	0.78	1.65
D.B.	3	2.12	2.60	1.20	0.23	1.06	1.13	1.64	2.03
O.B.	1	2.71	2.43	2.24	2.07	1.62	2.00	1.18	2.19
L.B.(2)	3	2.41	1.80	1.70	1.49	1.37	1.47	1.32	1.93
G.R.B.	9	0.94	0.83	0.32	0.94	1.28	0.95	1.00	1.47
C.C.	3	2.30	1.64	1.75	0.78	1.22	1.00	1.42	1.38
W.C.	2	0.61	0.21	0.79	1.00	0.65	1.22	0.31	1.61
J.C.	1	2.00	2.30	2.00	2.34	2.28	1.60	2.10	1.94
G.C.	2	2.53	2.47	3.00	2.89	2.66	2.31	2.60	2.11
R.C.	1	1.94	2.39	2.06	1.26	0.97	1.47	1.70	2.07
B.C.	9	-.12	0.41	0.27	1.64	0.28	0.07	0.86	0.81
A.C.	2	1.18	1.87	1.06	1.56	2.60	2.30	1.07	2.03
W.G.C.	6	1.82	1.07	0.77	0.56	0.95	0.94	1.38	1.08
F.C.	4	0.87	1.33	1.54	1.80	1.39	1.39	2.24	2.10
W.P.C.	2	2.64	2.06	2.67	2.41	2.17	2.65	1.70	2.26
C.D.	5	1.53	1.30	1.56	1.20	1.61	1.41	1.32	2.16
M.D.	7	0.59	0.67	0.76	-.18	1.42	1.17	1.24	1.84
D.D.	4	0.67	1.73	0.01	0.81	0.56	0.65	1.22	2.21
H.D.	8	1.47	2.16	2.00	2.00	1.94	2.20	2.04	2.31
R.D.	2	2.76	2.84	2.94	3.00	2.65	3.00	2.94	2.80
F.D.	3	1.35	1.18	1.00	0.71	0.56	1.39	1.14	1.69
M.D.	5	1.50	1.87	1.03	1.88	2.83	3.00	2.42	2.36
D.R.D.	3	0.56	1.69	1.00	1.90	1.83	0.64	1.41	1.11
F.D.	1	1.77	1.50	1.75	1.32	1.03	0.74	1.56	1.56
N.D.	4	2.78	2.78	2.89	2.63	1.18	2.83	2.61	2.82
W.D.	2	0.47	1.60	0.32	0.66	0.43	0.72	0.47	0.60

Appendix A (Continued)

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
J.E.	2	2.44	2.68	2.88	2.59	2.92	2.71	2.55	2.52
B.E.	3	2.39	1.88	1.51	1.65	2.15	2.00	1.56	1.25
G.E.	1	2.06	2.22	2.06	1.82	2.22	1.44	2006	2.61
E.F.	2	1.76	2.00	2.53	1.82	2.38	1.70	2.11	2.50
F.F.	3	1.92	2.00	1.75	1.06	1.00	1.10	0.53	1.33
D.G.	7	2.00	1.77	1.88	1.74	1.00	2.22	1.83	2.00
T.G.	1	1.79	2.00	1.39	1.25	1.53	1.34	1.61	1.41
W.G.	2	2.05	2.12	1.39	2.20	1.53	2.39	2.39	1.66
O.G.	5	1.53	1.77	1.63	1.90	1.78	1.67	2000	2.60
H.G.	4	1.62	2.33	1000	2.23	2.40	2.27	1.83	2.72
C.H.	1	2.44	2.12	2.33	2.67	2.00	2.25	2.79	2.38
W.H.	1	2.22	2.18	2.26	2.56	2.13	2.00	1.33	1.33
L.H.	2	2.88	2.89	2.58	2.89	2.83	2.67	3.00	2.84
G.H.	5	1.53	2.56	2.56	1.97	1.43	2.34	1.87	1.44
N.H.	2	0.53	2.12	1.10	0.43	1.07	1.64	0.83	1.39
E.H.	1	1.71	1.41	2.29	1.22	1.31	2.35	1.41	2.41
J.H.	4	1.88	1.06	1.56	1.54	1.97	1.57	1.76	1.65
R.H.	4	1.65	1.47	1.97	1.57	2.48	2.48	2.28	2.50
S.H.	2	1.94	1.84	2.00	1.94	2.29	2.59	2.90	2.84
H.H.	4	2.41	2.42	2.18	2.49	2.77	2.61	2.78	2.57
A.H.	2	2.47	2.59	2.20	1.62	1.11	2.58	1.79	2.21
N.H.	3	2.12	1.72	1.00	0.83	1.53	1.90	1.94	1.40
E.R.H.	8	2.06	2.88	1.58	2.28	2.33	1.67	2.59	2.38
H.R.H.	4	1.17	1.59	1.27	1.39	1.50	1.29	1.94	2.21
M.H.	10	1.53	1.12	0.75	1.29	0.43	0.44	2.06	1.38
V.H.	8	1.06	0.75	1.00	0.15	0.48	1.00	0.57	0.58
M.H.(2)	2	2.30	2.82	2.33	2.57	2.44	2.57	2.65	2.82
E.H.(2)	1	2.28	2.00	1.94	2.00	2.11	2.00	2.67	1.82
O.H.	4	0.80	1.33	1.24	0.50	0.71	1.06	1.28	1.60
A.H.	8	1.00	1.00	2.25	2.46	2.05	2.61	2.42	3.00
M.C.H.	10	0.25	0.27	-.30	1.06	1.70	-.14	1.06	1.50
W.I.	5	0.43	0.94	-.07	0.50	1.07	1.00	0.60	1.09
H.I.	4	0.88	0.94	0.53	-.47	-.57	0.76	1.00	0.84
J.J.	5	1.30	2.05	1.22	1.69	1.05	1.20	0.44	0.50
R.J.	4	1.21	0.59	-.25	0.33	0.94	0.89	1.21	1.16
H.J.	5	1.83	1.41	1.65	0.84	1.08	2.00	1.34	1.38
E.J.	10	0.82	0.12	1.56	1.27	0.71	0.67	0.82	1.33
E.E.J.	8	1.48	0.07	0.66	0.44	0.49	1.29	1.17	1.40
N.J.	10	0.78	0.80	0.85	0.50	1.09	1.81	1.45	0.90
W.K.	7	1.30	0.77	1.53	2.42	0.93	1.19	0.89	1.43
H.K.	6	0.78	1.25	1.00	0.74	1.89	2.05	1.16	0.77
A.K.	8	1.00	0.47	-.29	0.67	-.80	1.13	0.52	0.67
R.K.	2	2.06	2.56	1.58	2.24	2.46	2.05	2.42	2.38
E.K.	6	2.00	1.05	0.64	-.11	0.14	1.10	0.68	0.89
N.K.	3	1.12	2.19	1.17	1.73	1.82	2.70	2.08	1.63
S.K.	2	2.39	2.00	2.00	2.31	1.80	1.82	1.43	2.07

Appendix A (Continued)

Name Code	Decile Group	Semesters							
		<u>1st</u>	<u>2nd</u>	<u>3th</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
C.K.	3	2.59	2.61	2.31	1.92	1.18	1.92	2.75	2.11
W.K.	5	0.94	1.72	2.00	1.95	1.74	1.79	1.83	1.29
G.K.	7	2.41	1.67	1.35	2.44	1.79	1.80	1.38	2.07
W.K.	5	2.53	2.39	1.71	2.17	2.47	2.77	1.53	2.72
C.K(2)	2	1.65	1.22	0.00	0.63	0.39	0.72	1.00	1.00
R.K.	2	1.60	1.21	0.67	0.60	1.16	0.47	1.06	1.31
V.K.	3	2.88	2.72	2.37	2.26	1.76	1.90	1.62	0.77
C.K.	8	0.27	0.57	0.75	1.35	0.53	1.42	1.24	1.33

Appendix B

The Average Grade Points by Semesters of 50 Graduates
of the School of Engineering and Architecture who were in
the First, Second, and Third Decile Groups.

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
E.A.	2	2.37	2.29	2.33	2.06	2.09	2.61	2.18	2.33
L.A.	1	1.19	1.71	1.39	1.72	1.89	2.29	1.63	2.62
R.A.	3	1.00	0.00	0.17	0.39	1.25	1.00	0.18	0.73
H.B.	3	1.31	1.50	2.16	0.90	1.40	1.82	1.94	1.90
J.B.	1	1.50	1.12	- .83	0.87	- .17	0.57	1.27	0.93
E.B.	1	0.50	0.83	0.27	1.97	1.15	1.10	0.64	0.73
W.B.	3	1.74	2.06	1.41	2.22	1.78	1.06	1.67	1.22
L.B.	1	1.82	2.88	1.70	1.39	1.88	1.54	2.21	2.00
C.C.	3	2.30	1.64	1.75	0.78	1.22	1.00	1.42	1.38
W.C.	2	0.61	0.21	0.79	1.00	0.65	1.22	0.31	1.61
J.C.	1	2.00	2.30	2.00	2.34	2.28	1.60	2.10	1.94
G.C.	2	2.53	2.47	3.00	2.89	2.66	2.31	2.60	2.11
R.C.	1	1.94	2.39	2.06	1.26	0.97	1.47	1.70	2.07
A.C.	2	1.18	1.81	1.06	1.56	2.60	2.30	1.07	2.03
P.C.	2	2.64	2.06	2.61	2.41	2.17	2.65	1.70	2.26
R.C.	2	2.76	2.84	2.94	3.00	2.65	3.00	2.84	2.80
F.D.	3	1.35	1.18	1.00	0.71	0.56	1.39	1.17	1.69
D.D.	3	0.56	1.69	1.00	1.90	1.83	0.64	1.41	1.11
M.D.	1	1.83	1.84	0.64	0.91	0.78	1.37	0.91	1.59
W.D.	2	0.47	0.60	0.33	0.66	0.43	0.72	0.47	0.60
J.E.	2	2.44	2.68	2.88	2.59	2.92	2.71	2.55	2.52
B.E.	3	2.39	1.88	1.57	1.65	2.15	2.00	1.56	1.25
G.E.	1	2.06	2.22	2.06	1.82	2.22	1.44	2.06	2.61
E.F.	2	1.76	2.00	2.53	1.82	2.38	1.70	2.11	2.50
F.F.	3	1.92	2.00	1.75	1.06	1.00	1.10	0.53	1.33
T.G.	1	1.79	2.00	1.39	1.25	1.53	1.34	1.61	1.49
C.H.	1	2.44	2.12	2.33	2.67	2.00	2.25	2.79	2.38
H.H.	1	2.22	2.18	2.26	2.56	2.13	2.00	1.33	1.33
L.H.	2	2.88	2.89	2.58	2.89	2.83	2.67	3.00	2.84
N.H.	2	0.53	2.12	1.10	0.43	1.07	1.64	0.83	1.39
E.H.	1	1.71	1.41	1.41	2.29	1.22	1.31	2.35	2.41
S.H.	2	1.94	1.84	2.00	1.94	2.29	2.59	2.90	2.84
L.H.	2	2.47	2.59	2.20	1.62	1.11	2.58	1.79	2.21
H.N.H.	3	2.12	1.72	1.00	0.83	1.53	1.70	1.94	1.40
M.H.	2	2.30	2.82	2.33	2.57	2.44	2.57	2.65	2.82
E.H.	1	2.28	2.00	1.94	2.00	2.11	2.00	2.67	1.82
W.K.	2	2.06	2.56	1.58	2.24	2.46	2.05	2.42	2.38
E.K.	3	1.12	2.19	1.17	1.73	1.82	2.70	2.08	1.63
A.K.	2	2.39	2.00	2.00	2.31	1.80	1.82	1.43	2.07
C.K.	3	2.59	2.61	2.31	1.92	1.92	2.75	1.18	2.11

Appendix B (Continued)

Name Code	Decile Group	Semesters							
		<u>1st</u>	<u>2nd</u>	<u>3th</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
R.K.	2	1.60	1.21	0.67	0.60	1.16	0.47	1.06	1.31
V.K.	3	2.88	2.72	2.37	2.26	1.76	1.90	1.62	0.77
W.G.	2	2.05	2.12	1.39	2.20	1.53	2.39	2.39	1.66

Appendix C

The Average Grade Points by Semesters of 29 Graduates of the School of Engineering and Architecture who were in the Fourth, Fifth, and Sixth Decile Groups.

Name	Decile	Semesters							
Code	Group	1st	2nd	3th	4th	5th	6th	7th	8th
J.B.	6	1.00	0.93	0.89	0.21	0.37	1.28	1.35	1.30
W.B.	4	1.56	0.94	1.00	0.64	1.34	1.56	0.74	1.13
A.B.	6	1.00	1.33	0.59	-.26	0.81	0.63	0.48	1.05
G.B.	6	1.00	1.97	1.50	0.03	1.80	0.53	0.88	1.44
L.B.	6	2.23	1.41	1.18	1.26	0.77	0.67	1.18	1.84
R.B.	4	1.80	1.58	0.77	1.42	0.28	0.33	0.10	1.38
W.C.	6	1.82	1.07	0.77	0.56	0.95	0.94	1.38	1.08
F.C.	4	0.87	1.33	1.54	1.80	1.39	1.39	2.24	2.10
C.D.	5	1.53	1.30	1.56	1.20	1.61	1.41	1.32	2.16
D.D.	4	0.67	1.73	0.01	0.81	0.56	0.65	1.22	2.21
M.D.	5	1.50	1.87	1.03	1.88	2.83	3.00	2.42	2.36
N.D.	4	2.78	2.78	2.89	2.63	1.78	2.83	2.61	2.82
O.G.	5	1.53	1.77	1.63	1.90	1.78	1.67	2.00	2.60
H.G.	4	1.62	2.33	1.00	2.23	2.40	2.27	1.83	2.72
G.H.	5	1.53	2.57	2.56	1.97	1.43	2.34	1.87	1.44
J.H.	4	1.88	1.06	1.56	1.54	1.97	1.88	1.76	1.65
R.H.	4	1.65	1.47	1.47	1.97	1.57	2.48	2.28	2.50
L.H.	4	2.41	2.42	2.18	2.49	2.77	2.61	2.78	2.57
H.H.	4	1.17	1.59	1.67	1.49	1.50	1.29	1.94	2.21
R.H.	4	0.80	1.33	1.24	0.50	0.71	1.06	1.28	1.60
W.I.	5	0.43	0.94	-.07	0.50	1.07	1.00	0.60	1.09
H.I.	4	0.88	0.74	0.53	-.41	-.51	0.16	1.00	0.84
J.J.	5	1.30	2.05	1.22	1.69	1.05	1.20	0.44	0.50
R.J.	4	1.21	0.59	-.25	0.33	0.94	0.89	1.21	1.16
H.J.	5	1.83	1.41	1.65	0.84	1.08	2.00	1.34	1.38
H.K.	6	0.78	1.25	1.00	0.74	1.87	2.05	1.16	0.77
E.K.	6	2.00	1.05	0.64	-.11	0.14	1.10	0.60	0.89
W.K.	5	0.94	1.72	2.00	1.95	1.74	1.79	1.83	1.29
W.K.(2)	5	2.53	2.39	1.71	2.17	2.47	2.77	1.53	2.72

Appendix D

The Average Grade Points by Semesters of 21 Graduates of the School of Engineering and Architecture who were in the Seventh, Eighth, Ninth and Tenth Decile Groups.

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
A.A.	7	1.19	1.71	1.39	1.72	1.89	2.29	1.63	2.62
J.B.	7	1.53	1.00	0.64	0.79	0.69	0.89	-.11	1.39
H.B.	7	0.76	0.74	0.46	0.41	0.69	0.24	1.61	1.00
G.B.	9	0.94	0.83	0.32	0.94	1.28	0.95	1.00	1.47
G.C.	9	-.12	0.41	0.27	1.64	0.28	0.07	0.86	0.81
M.D.	7	0.59	0.67	0.76	-.18	1.42	1.17	1.24	1.84
H.D.	8	1.47	2.16	2.00	2.00	1.94	2.20	2.04	2.31
M.D.	8	1.77	2.50	1.75	1.32	1.31	0.74	1.56	1.56
D.G.	7	2.00	1.77	1.88	1.74	1.00	2.22	1.83	2.90
E.H.	8	2.06	2.88	1.58	2.28	2.33	1.67	2.59	2.33
M.H.	10	1.53	1.12	0.75	1.29	0.43	0.44	2.06	1.38
V.H.	8	1.06	0.75	1.00	0.57	0.15	0.48	1.00	0.58
A.H.	8	1.00	1.00	2.25	2.46	2.05	2.61	2.42	3.00
M.H.	10	0.25	0.27	-.30	1.06	1.70	-.14	1.06	1.50
E.J.	10	0.82	0.12	1.56	1.28	0.71	0.67	0.82	1.33
E.E.J.	8	1.48	0.07	0.66	0.44	0.49	1.29	1.17	1.40
R.J.	10	0.78	0.80	0.85	0.50	1.09	1.81	1.45	0.80
W.K.	7	1.30	0.77	1.53	2.42	0.93	1.19	0.89	1.43
A.K.	8	1.00	0.47	-.29	0.67	-.80	1.13	0.52	0.67
G.K.	7	2.41	1.67	1.35	2.44	1.79	1.80	1.38	2.07
C.K.	8	0.27	0.58	0.75	1.35	0.53	0.53	1.42	1.33

Appendix E

The Average Grade Points by Semesters of 100 Graduates of the College of Liberal Arts.

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
L.A.	2	2.13	2.27	1.56	1.74	2.25	2.23	2.12	1.92
V.A.	6	0.47	0.83	0.58	1.29	1.17	1.76	1.19	1.60
C.A.	8	1.53	0.31	1.13	1.61	1.38	1.76	1.43	1.40
A.A.	10	1.50	0.78	0.75	1.20	0.81	1.27	1.13	1.38
W.A.	6	2.20	1.50	2.00	1.67	1.80	2.00	2.08	2.06
B.A.	7	1.67	1.13	1.20	1.31	1.88	2.06	1.50	2.08
B.E.	3	1.64	2.00	2.21	1.67	1.40	1.50	2.25	2.14
L.E.	7	2.87	2.80	2.60	3.00	2.87	2.67	3.00	2.50
E.E.	2	1.23	2.28	2.07	2.26	2.06	2.12	2.77	2.00
K.E.	9	1.2	1.71	0.61	0.80	1.55	1.60	2.00	1.22
J.E.	4	2.00	1.38	1.53	1.80	1.82	1.44	-1.00	1.30
F.E.	7	2.77	2.00	3.00	2.23	2.47	2.71	2.82	2.70
E.B.	5	1.31	2.13	2.00	1.50	0.87	1.47	1.78	2.33
T.B.	1	2.86	2.31	3.00	2.62	3.00	3.00	2.23	2.17
R.B.	4	3.00	2.87	2.62	3.00	2.56	3.00	2.67	3.00
B.B.	6	1.93	1.69	2.33	1.88	1.53	1.50	0.93	1.27
C.B.	1	1.77	1.06	1.40	2.00	1.50	1.80	1.60	1.93
B.C.B.	8	0.67	0.50	0.00	0.60	0.94	1.33	1.12	1.57
M.B.	9	1.29	1.91	1.39	1.57	1.78	1.74	1.50	1.57
A.B.	6	1.93	0.87	1.13	1.00	1.50	1.06	1.31	1.35
H.B.	4	1.64	0.87	1.13	1.00	1.47	1.27	1.50	0.50
M.B.B.	5	2.20	2.20	2.00	2.33	1.81	1.19	1.75	1.67
H.B.(2)	3	2.15	2.17	0.25	2.54	2.29	2.56	1.71	2.67
B.B.(2)	10	1.00	0.60	0.83	1.44	1.25	1.07	1.00	1.07
S.B.	3	2.00	2.53	1.67	2.42	1.75	2.00	2.47	2.00
T.B.	8	1.14	1.42	0.80	0.87	2.00	1.62	1.53	2.30
E.C.	4	2.13	2.33	1.47	1.67	1.86	1.31	1.93	1.69
G.C.	2	2.47	2.50	2.40	2.85	2.07	2.73	2.69	3.00
C.D.	2	2.53	2.67	2.72	2.53	3.00	3.00	2.60	2.80
R.C.	9	-0.07	1.00	1.33	1.00	1.30	2.00	2.07	1.25
H.C.	3	3.00	2.67	2.29	2.33	2.50	2.28	3.00	3.00
M.C.	6	0.80	2.20	1.00	1.00	1.33	1.57	1.62	1.19
C.C.	4	1.62	3.00	2.21	2.47	2.61	2.00	2.00	2.19
L.C.	2	1.07	1.20	1.33	1.00	2.67	1.75	0.56	1.41
E.C.	8	1.00	1.00	0.47	1.00	1.67	1.13	1.11	1.43
R.C.	8	1.00	1.53	2.13	1.47	1.47	1.69	1.47	2.14
E.C.	8	1.87	2.33	1.67	1.72	1.20	1.75	1.67	2.20
M.E.C.	6	1.33	1.25	1.00	0.87	1.00	1.00	1.33	2.12
M.E.C(2)	3	1.73	2.00	1.93	1.47	2.00	1.59	2.21	1.60
C.C.(2)	9	0.47	1.25	1.00	1.00	1.87	1.85	1.31	1.43
D.D.	8	1.54	1.45	0.46	0.89	1.07	1.26	1.53	1.42
R.D.	5	2.17	0.69	0.70	1.30	1.40	1.00	1.46	2.45
R.D.	7	0.80	1.00	0.63	1.57	1.00	1.00	1.27	1.71

Appendix E(Continued)

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
I.D.	5	0.53	0.87	1.00	1.67	1.87	0.33	1.00	1.31
L.D.	10	0.23	0.60	0.33	0.53	0.77	1.00	1.15	1.69
R.D.	2	1.20	0.13	0.43	1.80	0.87	0.87	1.00	1.13
L.D.(2)	3	1.40	1.00	1.13	1.20	2.00	1.82	1.81	1.89
J.E.	7	0.67	1.00	0.47	0.15	1.00	0.00	2.23	2.00
M.E.	1	1.83	1.33	2.47	2.00	1.81	1.71	2.30	2.14
S.E.	2	2.00	1.20	1.47	1.80	1.93	2.27	1.67	2.00
G.E.	5	-.33	1.00	0.93	1.53	1.20	1.43	2.13	2.00
E.E.	10	1.33	1.40	1.47	2.00	1.28	1.18	1.20	1.30
C.E.	3	2.00	2.67	3.00	3.00	2.67	2.62	2.81	2.31
F.E.	7	1.62	1.36	1.57	1.00	0.33	1.80	0.67	0.11
V.F.	1	1.53	1.81	1.67	2.27	2.40	2.48	3.00	2.67
F.F.	1	2.33	2.20	1.67	2.00	1.73	1.81	2.35	2.62
O.F.	2	2.00	2.05	2.00	2.82	1.91	1.90	1.82	1.67
E.F.	6	1.27	1.07	2.33	1.85	1.75	1.60	1.87	2.00
J.F.	10	1.13	0.80	1.00	0.40	0.20	0.36	0.73	0.80
R.F.	4	1.33	1.67	0.67	1.40	1.00	1.47	1.73	1.87
M.F.	3	0.61	1.81	1.20	2.00	1.80	2.40	1.47	1.73
L.F.	10	1.50	0.87	2.07	2.19	1.62	1.87	0.93	1.43
H.F.	1	0.13	1.00	0.80	0.67	1.20	1.50	1.18	1.21
M.G.	1	2.67	2.53	2.58	2.40	2.06	1.95	2.47	1.64
R.G.	4	1.67	2.06	2.33	2.87	2.71	2.43	2.23	2.12
L.G.	2	2.67	2.80	3.00	2.59	2.67	2.83	2.07	2.84
L.L.G.	3	1.00	1.42	1.60	1.67	1.00	1.47	0.80	1.67
L.G.(2)	5	0.87	0.60	0.53	0.67	0.93	1.64	1.20	0.90
C.G.	1	3.00	3.00	2.67	3.00	1.90	2.67	3.00	2.55
I.G.	2	2.13	1.33	1.33	0.47	0.87	1.13	0.67	1.21
H.H.	2	2.00	1.60	1.33	1.33	1.47	1.57	1.71	1.64
E.H.	3	1.00	1.69	0.53	2.00	1.00	2.00	1.80	2.25
R.H.	3	0.67	0.80	1.13	0.60	1.87	1.20	1.86	1.88
A.H.	2	1.17	0.62	0.75	1.36	0.60	0.80	2.00	1.58
M.H.	7	1.00	1.33	0.53	1.11	1.54	1.00	0.88	1.12
F.H.	3	2.33	2.12	1.80	2.33	1.33	0.47	1.71	2.59
I.H.	4	1.00	1.00	1.14	0.67	1.80	1.14	1.87	1.33
G.H.	4	1.53	2.20	1.33	1.80	1.67	1.67	2.12	2.21
C.H.	3	0.00	1.61	0.50	1.88	2.00	2.11	1.69	1.78
V.H.	7	0.87	2.20	1.13	0.33	2.20	1.13	2.21	1.81
J.H.	4	2.00	1.81	1.47	1.17	1.18	1.69	1.33	1.73
A.H.	5	0.00	1.00	1.57	1.57	1.00	1.60	1.27	1.56
W.H.	2	1.33	1.61	1.38	1.13	0.47	1.67	1.40	1.00
H.J.H.	1	1.33	1.33	1.47	2.25	1.88	2.05	1.73	2.15
M.H.	2	2.20	1.80	1.60	1.60	1.47	2.27	2.00	1.19
F.H.	4	1.67	1.33	1.38	2.36	2.19	2.50	2.60	2.50
B.J.	5	2.27	2.07	2.33	2.47	2.07	2.37	3.00	2.62
G.J.	10	-.13	0.33	1.62	1.07	1.00	1.17	1.36	1.29

Appendix E (Continued)

Name	Decile	Semesters							
Code	Group	<u>1st</u>	<u>2nd</u>	<u>3th</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
E.J.	5	1.00	0.90	1.67	1.13	1.47	1.48	1.13	1.13
J.J.	10	0.71	0.70	0.27	1.43	1.87	1.43	2.00	1.88
L.J.	4	1.14	2.25	1.80	1.94	2.13	1.80	1.60	1.80
L.J.J.	8	0.40	1.33	1.33	0/50	0.23	1.36	1.15	1.26
V.K.	5	1.47	1.87	2.29	1.58	1.25	1.14	1.56	1.55
B.K.	2	1.67	1.33	1.67	2.33	1.17	1.94	1.60	1.80
M.K.	8	0.33	0.06	1.17	0.86	1.20	1.84	1.61	1.33
F.K.	2	2.53	2.37	2.47	2.40	2.62	2.50	2.53	2.20
W.K.	3	2.60	1.56	2.27	1.41	1.67	1.38	1.69	1.58
E.K.	2	1.67	2.20	2.33	2.60	2.69	2.29	2.13	1.94
F.K.	1	3.00	2.94	2.71	1.00	1.17	2.31	2.00	2.20
A.K.	10	2.00	1.20	1.60	0.94	0.63	1.00	1.27	1.71

Appendix F

The Average Grade Points by Semesters of 42 Graduates
of the College of Liberal Arts who were in the First, Second,
and Third Decile Groups.

Name Code	Decile Groups	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
B.B.	3	1.64	2.00	2.21	1.67	1.40	1.50	2.25	2.14
L.B.	1	2.87	2.80	2.60	3.00	2.87	2.67	3.00	2.50
E.B.	2	1.23	2.28	2.07	2.26	2.06	2.12	2.77	2.00
T.B.	1	2.86	2.31	3.00	2.62	3.00	3.00	2.23	2.17
H.B.	3	2.15	2.07	0.25	2.54	2.29	2.56	1.71	2.67
C.D.	2	2.53	2.67	2.72	2.53	3.00	3.00	2.60	2.80
L.C.	2	1.07	1.20	1.33	1.00	1.67	1.75	0.56	1.41
R.D.	2	1.20	0.13	0.43	1.80	0.87	0.87	1.00	1.13
J.E.	2	2.00	1.20	1.47	1.80	1.93	2.27	1.67	2.00
C.E.	3	2.00	2.67	3.00	3.00	2.67	2.62	2.82	2.31
M.F.	3	0.67	1.87	1.20	2.00	1.80	2.40	1.47	1.73
H.F.	1	0.13	1.00	0.80	0.67	1.20	1.50	1.18	1.21
M.G.	1	2.67	2.53	2.58	2.40	2.06	1.95	2.47	1.64
L.G.	2	2.67	2.80	3.00	2.59	2.67	2.83	2.07	2.84
L.L.G.	3	1.00	1.42	1.60	1.67	1.00	1.47	0.80	1.67
C.G.	1	3.00	3.00	3.00	2.67	3.00	3.00	1.90	2.67
R.H.	3	0.67	0.80	1.13	0.60	0.87	1.20	1.86	1.88
A.H.	2	1.17	0.62	0.75	1.36	0.60	0.80	2.00	1.58
J.H.	3	2.33	2.13	1.80	2.33	1.33	0.47	1.71	2.59
C.H.	3	0.00	1.61	0.50	1.88	2.00	2.11	1.69	1.78
H.H.	2	1.33	1.67	1.38	1.13	0.47	1.67	1.40	1.00
F.K.	2	2.53	2.37	2.47	2.40	2.62	2.50	2.53	2.20
W.K.	3	2.60	1.56	2.27	1.41	1.67	1.38	1.69	1.58
L.K.	1	3.00	2.94	2.71	1.00	1.17	2.31	2.00	2.20
L.A.	2	2.13	2.27	1.56	1.74	2.25	2.23	2.12	1.92
J.B.	1	1.77	1.06	1.41	2.00	1.50	1.80	1.60	1.93
S.B.	3	2.00	2.53	1.67	2.42	1.75	2.00	2.47	2.00
G.C.	2	2.47	2.50	2.40	2.85	2.07	2.73	2.69	3.00
H.C.	2	3.00	2.67	2.29	2.33	2.50	2.28	3.00	3.00
M.C.	3	1.73	2.00	1.93	1.47	2.00	1.59	2.21	1.60
L.D.	3	1.40	1.00	1.13	1.20	2.00	1.82	1.81	1.89
M.E.	1	1.83	1.33	2.47	2.00	1.81	1.71	2.30	2.14
V.F.	1	1.53	1.81	1.67	2.27	2.40	2.48	3.00	2.67
F.F.	1	2.33	2.20	1.67	2.00	1.73	1.81	2.35	2.62
O.F.	1	2.00	2.05	2.00	2.87	1.91	1.90	2.33	1.67
L.G.	2	2.13	1.33	1.33	0.47	0.87	1.13	0.67	1.21
H.H.	2	2.00	1.60	1.33	1.33	1.47	1.57	1.71	1.64
E.H.	3	1.00	1.69	0.53	2.00	1.00	2.00	1.80	2.25
J.H.	1	1.33	1.33	1.47	2.25	1.88	2.05	1.73	2.15
M.H.	2	2.20	1.80	1.60	1.60	1.47	2.27	2.00	1.79
B.K.	2	1.67	1.33	1.67	2.33	1.17	1.94	1.60	1.80
E.K.	2	1.67	2.20	2.33	2.60	2.69	2.29	2.13	1.94

Appendix G

The Average Grade Points by Semesters of 29 Graduates of the College of Liberal Arts who were in the Fourth, Fifth, and Sixth Decile Groups.

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
J.B.	44	2.00	1.38	1.53	1.80	1.82	1.44	-1.00	1.30
R.B.	4	3.00	2.87	2.62	3.00	2.56	3.00	2.67	3.00
B.B.	6	1.93	1.69	2.33	1.88	1.53	1.50	1.06	1.31
A.B.	6	1.93	0.87	1.13	1.00	1.50	1.06	1.31	1.35
C.C.	4	1.62	3.00	2.21	2.47	2.61	2.00	2.00	2.19
P.D.	5	2.17	0.69	0.70	1.30	1.40	1.00	1.46	2.45
L.G.	5	0.87	0.60	0.53	0.67	0.93	1.64	1.20	0.90
J.H.	4	2.00	1.81	1.47	1.17	1.18	1.67	1.33	1.73
W.H.	5	0.00	1.00	1.57	1.57	1.00	1.60	1.27	1.57
B.J.	5	2.27	2.07	2.33	2.47	2.17	2.31	3.00	2.62
L.J.	4	1.14	2.25	1.80	1.94	2.13	1.80	1.60	1.80
V.K.	5	1.47	1.87	2.29	1.58	1.25	1.14	1.56	1.55
V.A.	6	0.41	0.83	0.58	1.29	1.17	1.76	1.19	1.60
E.B.	5	1.31	2.13	2.00	1.50	0.87	1.47	1.78	2.33
H.B.	4	1.64	0.87	1.13	1.00	1.47	1.27	1.50	0.50
M.B.	5	2.20	2.20	2.00	2.33	1.81	1.19	1.75	1.67
E.C.	4	2.13	2.33	1.41	1.61	1.86	1.31	1.93	1.69
M.C.	6	0.80	2.20	1.00	1.00	1.33	1.57	1.62	1.19
M.E.C.	6	1.33	1.25	1.00	1.87	1.00	1.00	1.33	2.12
I.D.	5	0.53	0.87	1.00	1.67	1.87	0.33	1.00	1.31
G.E.	5	-0.33	1.00	0.93	1.53	1.20	1.43	2.13	2.00
V.F.	6	1.27	1.07	2.33	1.85	1.15	1.60	1.87	2.00
R.F.	4	1.33	1.67	0.67	1.40	1.00	1.47	1.73	1.89
R.G.	4	1.67	2.06	2.33	2.87	2.71	2.43	2.23	2.12
I.H.	4	1.00	1.00	1.14	0.67	1.80	1.14	1.87	1.33
G.H.	4	1.53	2.20	1.33	1.80	1.67	1.67	2.12	1.21
V.H.	4	1.67	1.33	1.38	2.36	2.19	2.50	2.60	2.50
E.J.	5	1.00	0.90	1.67	1.13	1.47	1.48	1.13	1.13

Appendix H

The Average Grade Points by Semesters of 29 Graduates of the College of Liberal Arts who were in the Seventh, Eight, Ninth, and Tenth Decile Groups.

Name	Decile Code Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
C.A.	8	1.53	0.31	1.13	1.61	1.38	1.76	1.43	1.40
A.A.	10	1.50	0.73	0.75	1.20	0.81	1.27	1.13	1.38
B.A.	7	1.67	1.13	1.20	1.31	1.88	2.06	1.50	2.08
C.B.	9	1.20	1.71	0.61	0.60	1.55	1.60	2.00	1.22
B.B.	8	0.87	0.50	0.00	0.60	0.94	1.33	1.12	1.57
J.B.	9	1.29	1.91	1.39	1.57	1.78	1.74	1.50	1.57
T.B.	8	1.14	1.42	0.80	0.87	2.00	1.62	1.93	2.30
R.C.	9	-0.07	1.00	1.33	1.00	1.30	2.00	2.07	1.25
J.E.	7	0.67	1.00	0.47	0.00	2.23	0.15	1.00	2.00
F.E.	8	1.62	1.36	1.57	1.00	0.33	0.80	1.67	0.11
F.B.	7	2.77	2.00	3.00	2.23	2.47	2.71	2.82	2.70
B.B.	10	1.00	0.60	0.83	1.44	1.25	1.07	1.00	1.07
E.C.	8	1.00	1.00	0.47	1.00	1.67	1.13	1.17	1.43
R.C.	8	1.00	1.53	2.13	1.47	1.47	1.69	1.47	2.14
M.C.	7	1.87	2.33	1.67	1.72	1.20	1.75	1.67	2.20
C.C.	9	0.47	1.23	1.00	1.00	1.87	1.85	1.31	1.43
D.D.	8	1.54	1.43	0.46	0.89	1.07	1.26	1.53	1.42
R.D.	7	0.80	1.00	0.63	1.57	1.00	1.00	1.27	1.71
L.D.	10	0.23	0.60	0.33	0.58	0.77	1.00	1.15	1.69
E.E.	10	1.33	1.40	1.47	2.00	1.28	1.18	1.20	1.30
J.F.	10	1.13	0.80	1.00	0.40	-0.20	0.36	0.75	0.80
M.F.	10	1.50	0.87	0.93	1.87	2.07	2.19	1.62	1.43
M.H.	7	1.00	1.33	0.53	1.11	1.54	1.00	0.88	1.12
V.H.	8	0.87	2.20	1.13	0.33	2.20	1.13	2.21	1.81
G.J.	10	-0.13	0.33	1.62	1.07	1.00	1.17	1.36	1.29
J.J.	10	0.71	0.70	0.27	1.43	1.87	1.43	2.00	1.88
L.J.	8	0.40	1.33	1.33	0.50	0.23	1.36	1.15	1.26
M.K.	8	0.33	0.06	1.17	0.86	1.20	1.84	1.67	1.33
A.K.	10	2.00	1.20	1.60	0.94	0.63	1.00	1.27	1.71

Appendix I

The Average Grade Points by Semesters of 46 Boys and 54 Girls who were Graduates of the College of Liberal Arts.

Name Code	Decile Group	Boys Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
C.A.	8	1.53	0.31	1.13	1.61	1.38	1.76	1.43	1.40
A.A.	10	1.50	0.78	1.20	0.81	1.27	1.13	0.75	1.38
B.A.	7	1.67	1.13	1.20	1.31	1.88	2.06	1.50	2.08
B.B.	3	1.64	2.00	2.21	1.67	1.40	1.50	2.25	2.14
L.B.	1	2.87	2.80	2.60	3.00	2.87	2.67	3.00	2.50
E.B.	2	1.23	2.28	2.07	2.26	2.06	2.12	2.77	2.00
K.B.	9	1.20	1.71	0.61	0.80	1.55	1.60	2.00	1.22
J.B.	4	2.00	1.38	1.53	1.80	1.82	1.44	-1.00	1.30
T.B.	1	2.86	2.31	3.00	2.62	3.00	3.00	2.23	2.17
R.B.	4	3.00	2.87	2.62	3.00	2.56	3.00	2.67	3.00
B.J.B.	6	1.93	1.69	2.33	1.88	1.53	1.50	0.93	1.27
B.C.B.	8	0.67	0.50	0.00	0.60	0.24	1.33	1.12	1.57
M.B.	9	1.22	1.91	1.39	1.57	1.78	1.74	1.50	1.57
A.B.	6	1.93	0.87	1.13	1.00	1.50	1.06	1.31	1.35
H.B.	3	2.15	2.07	0.25	2.54	2.22	2.56	1.71	2.67
S.B.	8	1.14	1.42	0.80	0.87	2.00	1.62	1.53	2.30
C.D.	2	2.53	2.67	2.72	2.53	3.00	2.60	3.00	2.80
R.C.	0	-0.07	1.00	1.33	1.00	1.30	2.00	2.07	1.25
C.C.	4	1.62	3.00	2.21	2.47	2.61	2.00	2.00	2.19
L.C.	2	1.07	1.20	1.33	1.00	1.67	1.75	0.56	1.41
P.D.	5	2.17	0.69	0.70	1.30	1.40	1.00	1.46	2.45
R.D.	2	1.20	0.13	0.43	1.80	0.87	1.00	0.87	1.13
J.E.	7	0.67	1.00	0.47	0.15	1.00	0.00	2.23	2.00
J.E.	2	2.00	1.20	1.47	1.80	1.93	2.27	1.67	2.00
C.E.	3	2.00	2.67	3.00	3.00	3.00	2.67	2.62	2.81
F.E.	7	1.62	1.36	1.57	1.00	0.33	0.80	0.67	0.11
M.F.	3	0.67	1.87	1.20	2.00	1.80	2.40	1.41	1.73
H.F.	1	0.13	1.00	0.80	0.67	1.20	1.50	1.18	1.21
M.G.	1	2.67	2.53	2.58	2.40	2.06	1.95	2.47	1.64
L.G.	2	2.67	2.80	3.00	2.59	2.67	2.83	2.07	2.84
L.L.G.	3	1.00	1.42	1.60	1.67	1.00	1.47	0.80	1.67
L.G.(2)	5	0.81	0.60	0.53	0.67	0.93	1.64	1.20	0.90
C.G.	1	3.00	3.00	3.00	2.67	3.00	1.90	2.67	2.55
R.H.	3	0.67	0.80	1.13	0.60	0.87	1.20	1.66	1.88
A.H.	2	1.17	0.62	0.75	1.36	0.60	0.80	2.00	1.58
J.H.	3	2.33	2.13	1.80	2.33	1.33	0.47	1.71	2.59
C.H.	3	0.00	1.61	0.50	1.88	2.00	2.11	1.69	1.78
J.H.	4	2.00	1.81	1.47	1.17	1.18	1.69	1.33	1.73
W.H.	5	0.00	1.00	1.57	1.57	1.00	1.60	1.27	1.56
W.H.	2	1.33	1.67	1.38	1.13	0.47	1.67	1.40	1.00
B.J.	5	2.27	2.07	2.33	2.47	2.07	2.37	3.00	2.62

Appendix I (Continued)

Boys

Name Code	Decile Group	Semesters							
		<u>1st</u>	<u>2nd</u>	<u>3th</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
L.J.	4	1.14	2.25	1.80	1.94	2.13	1.80	1.60	1.80
V.K.	5	1.47	1.87	2.29	1.58	1.25	1.14	1.56	1.55
F.K.	2	2.53	2.37	2.47	2.40	2.62	2.50	2.53	2.20
W.K.	3	2.60	1.56	2.27	1.41	1.67	1.38	1.69	1.58
F.K.	1	3.00	2.94	2.71	1.00	1.17	2.31	2.00	2.20

Appendix I(Continued)

Girls

Name	Decile	Semesters							
Code	Group	1st	2nd	3th	4th	5th	6th	7th	8th
L.A.	2	2.13	2.37	1.56	1.74	2.25	2.23	2.12	1.92
V.A.	6	0.47	0.83	0.58	1.29	1.17	1.76	1.19	1.60
W.A.	6	2.20	1.50	2.00	1.67	1.80	2.00	2.08	2.06
F.B.	7	2.77	2.00	3.00	2.23	2.47	2.71	2.82	2.70
E.B.	5	1.31	2.13	2.00	1.50	0.87	1.47	1.78	2.33
J.B.L	1	1.77	1.06	1.40	2.00	1.50	1.80	1.60	1.93
H.B.	4	1.64	0.87	1.13	1.00	1.47	1.27	1.50	0.50
M.B.	5	2.20	2.20	2.00	2.33	1.81	1.19	1.75	1.67
B.B.	10	1.00	0.60	0.80	1.44	1.25	1.07	1.00	1.07
S.B.	3	2.00	2.53	1.67	2.42	1.75	2.00	2.47	2.00
E.C.	4	2.13	2.33	1.47	1.67	1.86	1.31	1.93	1.69
G.C.	2	2.47	2.50	2.40	2.85	2.07	2.73	2.69	3.00
H.C.	2	3.00	2.67	2.29	2.33	2.50	2.28	3.00	3.00
M.C.	6	0.80	2.20	1.00	1.00	1.33	1.57	1.62	1.19
F.C.	8	1.00	1.00	0.47	1.00	1.06	1.13	1.17	1.43
R.E.C.	8	1.00	1.53	2.13	1.47	1.47	1.69	1.27	2.14
M.E.C.	7	1.87	2.33	1.67	1.72	1.20	1.75	1.67	2.20
M.C.(2)	6	1.33	1.25	1.00	0.87	1.00	1.00	1.00	1.33
C.C.	9	0.47	1.25	1.00	1.00	1.87	1.85	1.31	1.43
D.D.	8	0.54	1.45	0.46	0.89	1.01	1.26	1.53	1.42
R.D.	7	0.80	1.00	0.63	1.57	1.00	1.00	1.27	1.71
I.D.	5	0.53	0.87	1.00	1.67	1.87	0.33	1.00	1.31
L.D.	10	0.23	0.60	0.33	0.58	0.77	1.00	1.15	1.69
L.D.(2)	3	1.40	1.00	1.13	1.20	2.00	1.82	1.81	1.89
M.E.	1	1.83	1.33	2.47	2.00	1.81	1.71	2.30	2.14
G.E.	5	- .33	1.00	0.93	1.53	1.20	1.43	2.13	2.00
E.E.	10	1.33	1.40	1.47	2.00	1.28	1.18	1.20	1.30
V.F.	1	1.53	1.81	1.67	2.27	2.40	2.48	3.00	2.67
F.F.	1	2.33	2.20	1.67	2.00	1.73	1.81	2.35	2.62
O.F.	1	2.00	2.05	2.00	2.87	1.91	1.90	2.23	1.67
V.F.	6	1.27	1.07	2.33	1.85	1.75	1.60	1.87	2.00
J.F.	10	1.13	0.80	1.00	0.40	-.20	0.36	0.75	0.80
R.F.	4	1.33	1.67	0.67	1.40	1.00	1.47	1.73	1.87
M.F.	10	1.50	0.87	0.93	1.87	2.07	2.19	1.62	1.43
R.G.	4	1.67	2.06	2.33	2.87	2.71	2.43	2.23	2.12
L.G.	2	2.13	1.33	1.33	0.47	0.87	1.13	0.61	1.21
H.H.	2	2.00	1.60	1.33	1.33	1.47	1.57	1.71	1.64
E.H.	3	1.00	1.69	0.53	2.00	1.00	2.00	1.80	2.25
M.H.	7	1.00	1.33	0.53	1.11	1.54	1.00	0.88	1.12
I.H.	4	1.00	1.00	1.14	0.67	1.80	1.14	1.81	1.33
G.H.	4	1.53	2.20	1.33	1.80	1.67	1.67	2.12	2.21
V.H.	7	0.87	2.20	1.13	0.33	2.20	1.13	2.21	1.81

Appendix I(Continued)

Name Code	Decile Group	Girls							
		Semesters							
		<u>1st</u>	<u>2nd</u>	<u>3th</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
H.H.	1	1.33	1.33	1.47	2.25	1.88	2.05	1.73	2.15
M.H.	2	2.20	1.80	1.60	1.60	1.47	2.27	2.00	1.79
V.H.	4	1.67	1.33	1.38	2.36	2.19	2.50	2.60	2.50
G.J.	10	-.13	0.33	1.62	0.07	1.00	1.17	1.36	1.29
E.J.	5	1.00	0.90	1.67	1.13	1.47	1.48	1.13	1.13
J.J.	10	0.71	0.70	0.27	1.43	1.87	1.43	2.00	1.88
L.J.	8	0.40	1.33	1.33	0.50	0.23	1.36	1.15	1.26
B.K.	2	1.67	1.33	1.67	2.33	1.17	1.94	1.60	1.80
M.K.	8	0.33	0.06	1.17	0.86	1.20	1.84	1.67	1.33
J.K.	2	1.67	2.20	2.33	2.60	2.69	2.29	2.13	1.94
A.K.	10	2.00	1.20	1.60	0.94	0.63	1.00	1.27	1.71

Appendix J

The Average Grade Points by Semesters of 50 Boys and 50 Girls who were Graduates of the College of Liberal Arts and in the Second, and Third Decile Groups.

Boys

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
B.B.	3	1.64	2.00	2.21	1.67	1.40	1.50	2.25	2.14
E.B.	2	1.23	2.28	2.07	2.26	2.06	2.12	2.77	2.00
H.B.	3	2.15	2.07	0.25	2.54	2.29	2.56	1.71	2.67
C.D.	2	2.53	2.67	2.72	2.53	3.00	3.00	2.60	2.80
L.C.	2	1.07	1.20	1.33	1.00	1.87	1.75	0.56	1.41
R.D.	2	1.20	0.13	0.43	1.80	0.87	0.87	1.00	1.13
J.E.	2	2.00	1.20	1.47	1.80	1.93	2.27	1.67	2.00
C.E.	3	2.00	2.67	3.00	3.00	2.67	2.62	2.81	2.31
M.F.	3	0.67	1.87	1.20	2.00	1.80	2.40	1.47	1.73
L.G.	2	2.67	2.80	3.00	2.59	2.67	2.83	2.07	2.84
L.G.	3	1.00	1.42	1.60	1.67	1.00	1.47	0.80	1.67
R.H.	3	0.67	0.80	1.13	0.60	0.87	1.20	1.86	1.88
A.H.	2	1.17	0.62	0.75	1.36	0.60	0.80	2.00	1.58
J.H.	3	2.33	2.13	1.80	2.33	1.33	0.47	1.71	2.59
C.H.	3	0.00	1.61	0.50	1.88	2.00	2.11	1.69	1.78
W.H.	2	1.33	1.67	1.38	1.13	0.47	1.67	1.40	1.00
F.K.	2	2.53	2.37	2.47	2.40	2.40	2.62	2.50	2.53
W.K.	3	2.60	1.56	2.27	1.41	1.67	1.38	1.69	1.58
H.K.	2	1.36	2.36	2.03	1.66	1.33	2.44	0.53	0.95
E.M.	3	1.47	1.20	1.94	1.60	1.80	1.25	1.15	1.57
R.M.	2	3.00	2.87	2.53	2.81	2.80	2.64	2.33	2.81
G.O.	3	1.33	1.33	1.87	1.67	1.31	1.54	1.81	2.19
F.R.	2	2.80	2.69	3.00	3.00	2.78	3.00	3.00	3.00
A.P.	3	1.55	1.77	2.00	1.88	1.35	1.53	1.39	1.38
R.P.	2	0.93	1.31	0.15	1.25	1.38	1.81	1.38	1.35
H.P.	3	1.67	1.67	1.14	1.71	0.92	0.54	0.93	1.69
J.S.	3	1.07	1.20	0.53	0.87	0.50	1.50	1.16	1.00
D.S.	2	2.13	2.20	2.07	1.93	1.93	1.93	2.80	2.40
E.S.	3	1.00	0.93	1.43	1.20	1.00	1.20	1.87	1.50
C.S.	2	3.00	3.00	3.00	3.00	2.22	3.00	3.00	3.00
J.W.	2	1.36	0.21	1.15	0.67	0.00	1.43	0.75	1.67
R.W.	2	2.15	2.47	1.69	2.18	2.56	2.10	3.00	2.65
G.W.	3	2.33	2.67	2.21	1.12	2.13	2.07	2.00	1.56
B.A.	3	1.86	1.06	1.14	1.41	1.47	0.93	0.93	0.47
P.A.	2	1.50	1.88	2.50	2.30	2.39	2.94	2.80	2.80
O.B.	3	1.33	1.20	0.67	0.67	1.33	1.33	1.07	1.60
R.B.	3	2.00	1.80	2.07	1.90	0.94	1.94	2.30	2.20

Appendix J(Continued)

Boys

Semesters

Name Code	Decile Group	<u>1st</u>	<u>2nd</u>	<u>3th</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
K.C.	3	1.40	1.33	1.75	2.11	0.93	1.47	1.93	2.39
D.C.	2	0.80	1.67	1.14	1.36	1.57	0.94	1.93	1.69
P.C.	3	0.33	-.13	0.53	0.33	1.53	1.00	1.33	1.67
C.C.	3	1.75	1.88	2.33	2.67	1.62	2.33	0.94	1.67
B.G.	2	1.31	-.07	1.80	1.77	1.10	2.00	1.38	1.60
A.J.	2	2.00	2.13	2.00	1.77	1.94	2.87	0.94	2.32
A.K.	3	1.19	1.20	1.33	2.00	1.38	0.93	1.13	1.00
H.M.	3	1.67	2.00	0.19	2.00	0.19	1.82	1.61	1.82
D.R.	2	0.79	2.73	0.79	1.53	2.60	1.86	1.00	1.67
H.S.	2	0.87	0.73	0.53	1.79	1.93	1.65	0.14	1.19
J.S.	3	1.23	0.23	0.42	2.15	1.38	1.00	1.50	1.44
J.T.	2	1.50	1.13	-.03	1.13	1.92	2.33	2.00	0.94
J.W.	2	2.47	2.53	2.67	3.00	2.80	2.67	2.44	3.00

Appendix J (Continued)

Girls

Name Code	Decile Group	Semesters							
		1st	2nd	3th	4th	5th	6th	7th	8th
L.A.	2	2.13	2.27	1.56	1.74	2.25	2.23	2.12	1.92
S.B.	3	2.00	2.53	1.67	2.42	1.75	2.00	2.47	2.00
G.C.	2	2.47	2.50	2.40	2.85	2.07	2.73	2.69	3.00
H.C.	2	3.00	2.67	2.29	2.33	2.50	2.38	3.00	3.00
M.C.	3	1.73	2.00	1.93	1.47	2.00	1.59	2.21	1.60
L.D.	3	1.40	1.00	1.13	1.20	2.00	1.82	1.81	1.89
L.G.	2	2.13	1.33	1.33	0.47	0.87	1.13	0.67	1.21
H.H.	2	2.00	1.60	1.33	1.33	1.47	1.57	1.71	1.64
E.H.	3	1.00	1.69	0.53	2.00	1.00	2.00	1.80	2.25
M.H.	2	2.20	1.80	1.60	1.60	1.47	2.27	2.00	1.79
B.K.	2	1.67	1.33	1.67	2.33	1.17	1.94	1.60	1.80
E.K.	2	1.67	2.20	2.33	2.60	2.69	2.29	2.13	1.94
B.M.	3	2.67	2.23	2.87	2.92	2.71	2.67	3.00	2.30
M.M.	3	2.33	2.33	2.00	2.38	2.27	2.31	2.40	2.13
C.M.	3	0.53	0.65	1.53	1.47	1.79	2.20	1.67	2.00
G.N.	3	1.67	1.33	1.60	1.87	1.67	1.93	1.53	1.53
J.P.	2	2.33	2.47	2.27	2.50	2.38	2.81	2.57	2.81
M.R.	2	2.00	2.47	2.20	2.53	1.71	1.88	2.20	2.19
C.S.	2	2.00	1.75	0.93	2.13	1.33	1.85	2.31	3.00
D.S.	2	1.67	1.67	1.50	2.67	1.88	2.20	2.00	2.25
S.S.	2	1.71	0.96	2.00	1.67	1.06	1.75	1.21	1.50
H.S.	3	1.40	1.54	1.67	2.17	1.53	1.31	1.64	1.60
M.S.	2	1.13	1.20	1.33	1.33	1.27	1.87	1.75	1.57
S.T.	2	1.33	1.00	0.62	1.07	1.92	2.38	1.67	2.08
O.W.	3	2.00	1.47	1.33	2.60	1.94	1.62	2.00	2.64
R.W.	2	0.64	0.87	0.87	1.53	1.81	0.94	1.17	1.75
L.W.	3	2.67	2.33	2.47	2.07	2.55	2.47	2.00	2.58
E.B.	3	2.47	1.67	2.00	1.15	1.47	1.10	0.93	1.00
H.C.	2	2.53	1.93	2.47	2.00	2.13	1.33	2.33	2.00
A.C.	2	2.62	2.20	2.00	1.88	1.31	2.00	1.87	2.21
H.C. (2)	3	1.80	1.28	1.07	2.11	2.23	1.29	1.21	1.46
K.D.	2	1.50	1.67	0.69	0.67	1.43	1.50	1.40	1.00
H.D.	2	1.60	0.87	2.10	1.40	1.38	2.00	0.87	1.20
F.G.	3	2.71	2.64	2.78	3.00	3.00	2.62	2.80	3.00
A.G.	3	1.47	1.00	1.60	1.87	1.17	1.50	1.21	1.50
J.G.	2	1.40	1.67	2.00	1.50	1.60	1.65	2.45	2.50
R.G.	2	1.47	1.53	0.67	1.93	1.06	1.50	0.13	1.61
L.H.	2	2.00	2.00	2.23	2.38	2.31	1.88	1.87	2.00
K.H.	3	2.80	2.53	1.67	2.42	1.00	1.44	2.00	2.20
L.L.	2	1.53	1.69	2.00	0.72	0.67	2.64	0.80	1.69
K.M.	2	2.62	2.31	2.20	1.71	2.00	2.00	1.63	2.11
E.M.	3	1.13	1.33	1.92	1.46	1.00	1.21	1.67	1.36
E.P.	2	1.86	1.91	0.76	1.00	1.80	1.83	1.20	1.44
H.R.	2	1.36	1.07	1.00	1.47	1.80	1.13	1.12	1.89

Appendix J (Continued)

Girls

Name Code	Decile Group	Semesters							
		<u>1st</u>	<u>2nd</u>	<u>3th</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>
D.R.	3	1.50	1.47	1.13	1.81	1.06	2.00	2.19	1.20
F.S.	3	2.33	1.00	1.33	1.85	1.94	0.73	1.25	2.06
J.S.	2	2.20	1.33	2.73	2.80	2.27	1.75	1.63	1.18
M.S.	3	1.80	1.73	2.20	2.35	1.82	0.87	1.44	2.00
O.S.	3	1.62	1.29	1.46	2.00	1.53	2.00	1.60	2.00
G.S.	3	0.50	1.40	1.27	2.00	1.53	1.80	1.14	1.80