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ABSTRACT

The relation of average grades awarded to the average ability of the students was studied in a large sample of colleges. The mean and standard deviation of freshman classes on an ability test, along with the mean and standard deviation of the freshman year grades obtained by classes over a five year period was available for several hundred colleges. Difference scores on the mean and standard deviations were also calculated. Correlational analyses and analyses of colleges that changed most produced the following results: 1) within any given year colleges whose incoming students were bright tended to award higher grades, but there was considerable room for variance from this trend, 2) the average ability levels of colleges change very little, even over five year periods, 3) when the average ability of students increases (or decreases) about the same level of grades are awarded. This is interpreted as suggesting that faculties as a whole have preferred distribution of grades which they use whether their current classes of students are brighter or duller than previous classes. (Author)

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GRADING STANDARDS: THE RELATION OF CHANGES IN AVERAGE STUDENT ABILITY TO THE AVERAGE GRADES AWARDED

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GRADING STANDARDS: THE RELATION OF CHANGES IN AVERAGE STUDENT ABILITY TO THE AVERAGE GRADES AWARDED

Leonard L. Baird and William J. Fiester

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The question of academic standards is a persistent theme in rhetoric about higher education. On the one hand we hear that yesterday's college student could not compete academically with his peers of today and, on the other, that "standards" are slipping badly. Constantly rising admissions standards, according to one view, are resulting in college freshman classes that are brighter than previous freshman classes and will cause many able students to flunk out. According to another view, the floodgates have been opened to masses of unqualified students who will make an "A" meaningless.

In this discussion it seems sensible to look at the college grades being awarded to these students. One would expect higher grades to be awarded to brighter students.[2] Thus, we should examine the stability or change in the ability of incoming college students and the relation of average student ability to average college grades. We are then concerned with such questions as the following: To what extent <u>are</u> college student bodies becoming more able? When we describe the "academic pressure cooker" of rising standards are we talking about 10 percent, 25 percent, 50 percent or 100 percent of American colleges? When student ability rises, do college grades awarded rise proportionately? And what happens when the ability level of a student body decreases? How often does it happen? Do college grades tend to decrease too?

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[1]Much of the work reported in this paper was done while the authors were at The American College Testing Program.

[2]This expectation would be based on an assumption of fairly stable standards of performance, i.e., the level of performance required for a "B" would remain the same; when brighter students entered, a larger proportion of students would obtain "B's."

There are some related questions concerning the meaning of grades. Does the same grade represent the same level of accomplishment and ability from college to college? Is it the same from year to year? More generally, is the variation of average student ability and grading patterns so great that we know little about the meaning of a particular grade, or is there some relation between grades awarded and some permanent or stable standards?

These are important questions. This study was designed to try to find answers to them. The changes in academic ability in incoming students were studied in several hundred colleges, these changes were related to the average grades these students received in their first year of college.

Method

Source of Information

The American College Testing Program's Research Services provide research results and statistical summaries for colleges. The Standard and Basic Research Service provides data about the ability of freshmen, their overall grades in their first year of college, as well as equations for predicting grades. The Standard and Basic Research Service summary reports yielded the basic data used in this study. For each college, each year, data included the mean and standard deviation on the ACT Composite for the admitted freshmen, the means and standard deviation on the average of the student-reported high school grades, the mean and standard deviation of the freshman college grades awarded to these students, and the multiple correlation predicting grades from the ACT test scores and high school grades. These data were available for 284 colleges in 1964, 365 colleges in 1965, 469 colleges in 1966, 555 colleges in 1967, and 444 colleges in 1968.

Treatment of Data

The data for each college for each year were punched on cards. To normalize the distributions, the correlations were converted to Z scores, using Fisher's r to Z transformation. Then, using a missing data computer program, the difference scores between each set of data were computed. In this way, we derived difference scores for each statistic over two, three, four, and five years. Thus, for each statistic the following difference scores were computed:

Two years:	1968-1967, 1967-1966, 1966-1965, 1965-1964
Three years:	1968-1966, 1967-1965, 1966-1964
Four years:	1968-1965, 1967-1964
Five years:	1968-1964

Correlational Studies

Using a missing data computer program, we computed the correlations between all means, standard deviations, multiple correlations and the difference scores. These correlations showed year-to-year relationships which will be presented below.[3]

Analysis of Changing Colleges

In order to study the effects of changing levels of academic aptitude over various periods of time, we first counted the number of colleges where the ACT Composite mean score had changed less than 1, 1 to 1.4, 1.5 to 1.9, and 2.0 or greater standard scores. Then we selected the colleges which changed most over the three, four, and five years periods. In some cases, colleges with a change of two or more ACT Composite standard scores were selected, and in other cases, colleges with changes of 1.5 or more scores. We analyzed separately the colleges whose mean ACT Composite score increased and those whose means decreased.

[3]The results for the size of the multiple correlations will be presented elsewhere.

Results

The Question of "Standards"

The correlations between the mean ACT Composite scores and mean college grades awarded are shown in Table 1. There were low to moderate correlations between the average ability of incoming students and the average grades awarded to those students; colleges whose incoming students were bright tended to award higher average grades, and colleges whose incoming students were less able tended to award lower average grades. The correlations were moderate at best, however, and the unaccounted for variance suggested that many colleges with bright students tended to award low grades, and colleges with less able students tended to award high grades.

These correlations suggest some skepticism about the existence of "permanent" or "absolute" standards of academic performance--that the levels of performance required for a certain grade are roughly the same across colleges. On the other hand, the results indicate that standards are not completely random, nor tied solely to the ability distribution of each college.

Table 2 shows the correlation between the ACT Composite standard deviation and the standard deviation of college grades awarded. These correlations were also moderate. They suggest that colleges whose students include a broad range of academic aptitude tended to award a wider range of grades than colleges with narrow ranges of student aptitude.

Insert Tables 1 and 2 about here

The results shown in Tables 1 and 2 suggest that, taken as aggregate groups, faculties tended to have adjusted their grading practices to the characteristics of the students they teach. Where students were brighter they tended to award higher grades; where students represented a broader range of academic aptitude, they tended to award a broader range of grades. These tendencies were moderate, however. Most of the variance in the means and standard deviations of college grades was unrelated to the means and standard deviations of student talent.

Apparently these tendencies are based on very stable student bodies, as can be seen in Tables 3 and 4. The mean ability of students in 1964 correlated .93 with the mean ability of students in 1968 at 188 colleges. Over shorter periods the r was higher. The average ability of students at these various colleges was clearly very stable. The range of ability of the students enrolled was also stable, as shown by the correlations in Table 4. Thus, year to year both the average ability and distribution of ability were quite stable at the majority of colleges. As shown in Table 5, the mean grades awarded to students were also fairly stable, but not as stable as the average and distribution of ability. Thus, year after year, the student input of colleges changed very little. The results in Tables 3, 4, and 5 also suggest that the correlations in Tables 1 and 2 might have been higher, if grades had been more stable.

Insert Tables 3, 4, and 5 about here

Changing Standards and Faculty Responses

As we have just seen, the student input at most colleges remained the same from year to year. But what happened when student input changed?

Table 6 shows the correlations between the change scores for average student ability and the change scores for average grades awarded over various periods of time. The correlations were generally low, indicating a slight trend for faculty members to award higher or lower grades when student ability increased or decreased. Thus, there seemed to be little tendency for faculty to "adapt" to change a year or so later. Table 7 shows the correlations between change scores for the standard deviation of student ability and change scores for the standard deviation of college grades awarded. These correlations indicate a very slight tendency for a broader or narrower range of grades to be awarded when the range of student talent broadened or narrowed. There was almost no such tendency over the longest period of time.

The size of the correlations in Tables 6 and 7 may be curtailed due to the high stability of student input described earlier and because of the use of change scores. Because most colleges seemed to remain the same, and in order to examine changes directly, we conducted the analyses described in the next section.

Insert Tables 6 and 7 about here

Analysis of Changing Colleges

In order to study the effect of changing levels of academic aptitude in more detail, we carried out the analyses described in the Methods section above.

As shown in Table 8, most colleges changed very little--less than one standard score on the ACT Composite--over any period of time. For example, from 1964 to 1965, 87.3 of the colleges changed their mean ACT Composite score by less than one standard score point. Very few colleges changed as much as

two standard score points on the ACT Composite. This held true even over the period from 1964 to 1968, in which only about 5 percent of the colleges had changed student ability by as much as two standard scores--less than one-half a standard deviation on national college-bound student norms, or one standard deviation on norms based on college means. (Of course, a change of two standard score points would result in the presence of many more bright or dull students in a student body.)

Insert Table 8 about here

As a next step in the analysis a series of figures was developed to portray graphically the analyses of the colleges changing most in student input. In these figures, ACT Composite and college grade means were graphed in equal standard deviation units, based on national student norms. In order to make the effects of changes clearer, ACT Composite means and college grade point average means (GPA) were shown at the same point for the first year in each figure by moving the left or right hand scale. This procedure showed most clearly the effects of changing student ability. If college grading standards were consistent from year to year, the mean GPA should have followed the changes in student ability from year to year.

The colleges that increased the most, in student aptitude over three years, were first studied, as shown in Figures 1 and 2. College grades awarded did not rise to correspond to rises in student ability. And Figure 3 indicates that when colleges with declining student aptitude were combined, mean college grades did not consistently decline as student ability declined.

Insert Figures 1, 2, and 3 about here

In the colleges changing most in freshman student ability over four year periods (1964-1967 and 1965-1968) college grades did not rise correspondingly as indicated by Figures 4 and 5. Figure 6 suggests that grades awarded by faculties also did not consistently follow declines in student ability, and that the average grades awarded were about the same in 1965 and 1968--a four year period--despite a drop in student ability.

The ten colleges where the mean ACT Composite rose by two or more scores over five years are shown in Figure 7. Again, the mean grades awarded by the faculty to freshmen in these colleges remained about the same, despite a marked increase in student ability. The change in mean grades in 1968 is relatively small, in comparison.[4]

In colleges with changing student input faculties taken as a whole apparently awarded about the same grades from year to year whether their students were brighter or duller than the last year's students. The data in Figures 1 through 7 support this conclusion. They also suggest that few faculties base their grading practices on "absolute" standards, but rather, as Hills (1964) has suggested, seem committed to a certain distribution of grades. In short, most faculties, taken as an aggregate, award about the same average grades each year, despite increases or decreases in student academic aptitude.

Insert Figures 4, 5, 6, and 7 about here

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[4] The individual colleges which comprised the "changing" groups in these analyses were examined to see if they had any similarities. The colleges were of all types, levels, and control. Their enrollments, and changes in enrollments, were about average. They did not seem to have any common characteristics which would explain the changes in their student input.

Discussion

This study confirms the earlier research of Webb (1963), Hills (1964), Aiken (1963), Wilson (1970), and others which indicated that faculty members, at least collectively, prefer or are committed to a certain distribution of grades. Thus, faculties show an "adaptation level" by awarding, on the average, about the same average and distribution of grades, whether their current students are brighter or duller than last year's. Thus, following Helson (1964), we would surmise that faculty members "pool" the stimuli in the "judgment series"--the performance of their current students--and make judgments accordingly. (An interesting experiment could be done to examine this idea further among a group of faculty members who are faced with bright and dull students.)

The correlational results suggested that college grades did tend to rise slightly when student ability rose. (However, the largest correlation still accounted for only about 10 percent of the variance.) The analyses of colleges which changed the most, however, suggested that, when student input changes sharply, the average grades awarded do not change to correspond to the increased (or decreased) ability of students. These two sets of results seem incompatible. However, as noted, the correlational results showed low correlations, which allow for great variation, including colleges at the extremes of change.

In sum, the present results provide little evidence that faculties will adjust grades to correspond to changes in average student ability after some time lapse. Thus, the results shown in the graphs and the correlational results provide little evidence that permanent or absolute standards are employed in evaluation or that faculty generally take the changing ability level of their student bodies into account when deciding how many A's, B's, etc., to award.

These considerations suggest a practical problem. Without some information about a college, admissions officers and counselors have no sure way of knowing what level of ability a grade on a transcript represents. This may represent a large problem for graduate schools or colleges which accept many transfer students. These groups of students may require testing to estimate their chances in the local setting.

Another practical implication is that colleges should not expect to raise admissions requirements and thereby obtain a group of students who will necessarily make markedly higher grades. More likely, the faculty will continue to award about the same grades.

Of course, there are possible explanations of these results other than those offered here, such as a tendency toward regression toward the mean among changing colleges, or questions about the extent to which "true" grades are a function of what the ACT tests measure. However, the consistency of the results over a number of years makes these alternative explanations seem implausible.

Finally, there remain a host of critical educational questions, such as those raised by Wilson (1970). When aptitude goes up or down, does the actual "quality" of student work in the classroom increase or decrease? If students are evaluated according to "class norms," what are the consequences for their attitudes toward the professor, the subject, and their own abilities? How do current college students feel about being "ranked" in a competitive system? All these issues appear to warrant further investigation.

These considerations, taken with the relative stability of mean grades and mean ACT Composite scores, suggest that any further increases in the level of prediction of grades may come from improvements in grading practices. We need to devote as much attention to understanding faculty grade-giving behavior as we have to student grade-getting behavior.

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Table 1

Correlations between ACT Composite Means and College GPA Means

Year	r	Number of Colleges
1964	.35*	282
1965	.25*	361
1966	.36*	465
1967	.43*	551
1968	.42*	440

*Significant at the .01 level.

Table 2

Correlations between ACT Composite Standard Deviations and College GPA Standard Deviations

Year	r	Number of Colleges
1964	.39*	282
1965	.42*	361
1966	.46*	465
1967	.45*	551
1968	.49*	440

*Significant at the .01 level.

Table 3

Stability of the Mean ACT Composite

	Time Periods	r*	Number of Colleges
Two Years	1964-1965	.96	218
	1965-1966	.97	281
	1966-1967	.96	345
	1967-1968	.96	362
Three Years	1964-1966	.95	235
	1965-1967	.96	271
	1966-1968	.95	298
Four Years	1964-1967	.95	214
	1965-1968	.94	221
Five Years	1964-1968	.93	188

*All correlations significant at .01 level.

Table 4

Stability of ACT Composite Standard Deviations

Time Periods		r*	Number of Colleges
Two Years	1964-1965	.80	218
	1965-1966	.81	281
	1966-1967	.80	345
	1967-1968	.75	362
Three Years	1964-1966	.80	235
	1965-1967	.75	271
	1966-1968	.75	298
Four Years	1964-1967	.73	214
	1965-1968	.71	221
Five Years	1964-1968	.75	188

*All correlations significant at .01 level.

Table 5

Stability of Mean College GPA over Various Periods

College Grades		r*	Number of Colleges
Two Years	1964-1965	.64	218
	1965-1966	.74	281
	1966-1967	.73	345
	1967-1968	.78	362
Three Years	1964-1966	.68	235
	1965-1967	.58	271
	1966-1968	.70	298
Four Years	1964-1967	.57	214
	1965-1968	.66	221
Five Years	1964-1968	.61	188

*All correlations significant at .01 level.

Table 6

Correlations between Changes in ACT Composite Means and Changes in College GPA Means

Time Periods of Change Scores		r	Number of Colleges
Two Years	1964-1965 ACT Comp & 1964-1965 CGPA	.29*	218
	1965-1966 ACT Comp & 1965-1966 CGPA	.31*	281
	1966-1967 ACT Comp & 1966-1967 CGPA	.25*	345
	1967-1968 ACT Comp & 1967-1968 CGPA	.32*	362
Three Years	1964-1966 ACT Comp & 1964-1966 CGPA	.26*	235
	1965-1967 ACT Comp & 1965-1967 CGPA	.16*	271
	1966-1968 ACT Comp & 1966-1968 CGPA	.23*	298
Four Years	1964-1967 ACT Comp & 1964-1967 CGPA	.19*	214
	1965-1968 ACT Comp & 1965-1968 CGPA	.11	221
Five Years	1964-1968 ACT Comp & 1964-1968 CGPA	.30*	188

*Significant at the .01 level.

Table 7

Correlations between Changes in ACT Composite Standard Deviations and Changes in College GPA Standard Deviations

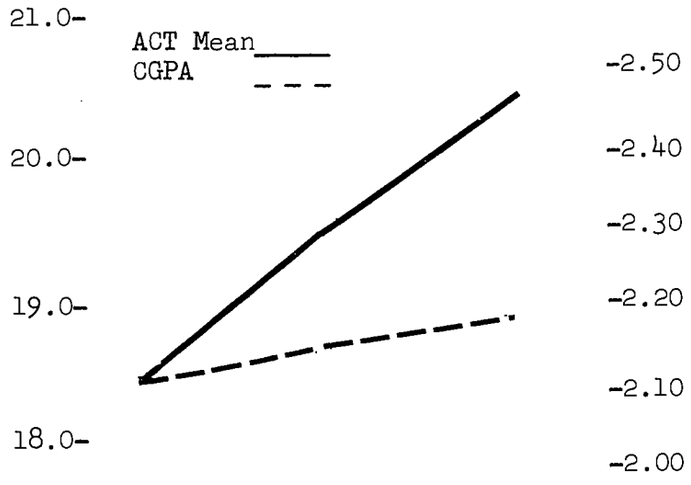
Time Periods of Change Scores		r	Number of Colleges
Two Years	1964-1965 ACT S.D. & 1964-1965 CGPA S.D.	.13	218
	1965-1966 ACT S.D. & 1965-1966 CGPA S.D.	.26*	281
	1966-1967 ACT S.D. & 1965-1967 CGPA S.D.	.23*	345
	1967-1968 ACT S.D. & 1967-1968 CGPA S.D.	.33*	362
Three Years	1964-1966 ACT S.D. & 1964-1966 CGPA S.D.	.18*	235
	1965-1967 ACT S.D. & 1965-1967 CGPA S.D.	.14	271
	1966-1968 ACT S.D. & 1966-1968 CGPA S.D.	.14	298
Four Years	1964-1967 ACT S.D. & 1964-1967 CGPA S.D.	.08	214
	1965-1968 ACT S.D. & 1965-1968 CGPA S.D.	.20*	221
Five Years	1964-1968 ACT S.D. & 1964-1968 CGPA S.D.	.05	188

*Significant at the .01 level.

Table 8

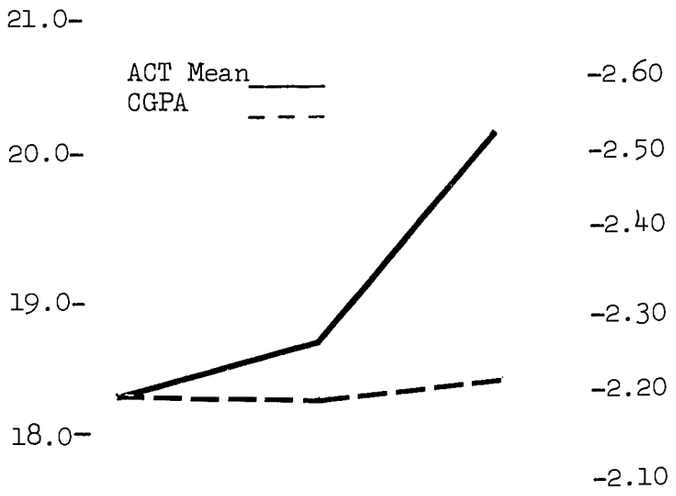
The Degree of Change in ACT Composite Means

	Percent Changing by Indicated Amount				
	Less than ±1.0	Between ±1.0 & 1.4	Between ±1.5 & 1.9	±2.0 & Greater	Number of Colleges
One Year Changes					
1964-1965	87.3	8.2	2.2	1.3	219
1965-1966	83.8	10.9	3.9	1.4	284
1966-1967	87.4	8.9	1.7	2.0	348
1967-1968	87.7	9.3	1.9	1.1	365
Two Year Change					
1964-1966	74.6	13.6	8.5	3.4	236
1965-1967	72.6	19.3	5.8	2.2	274
1966-1968	85.0	9.0	4.0	2.0	301
Three Year Change					
1964-1967	60.9	24.2	9.8	5.1	215
1965-1968	76.3	15.6	6.3	1.8	224
Four Year Change					
1964-1968	64.0	20.1	10.6	5.3	189



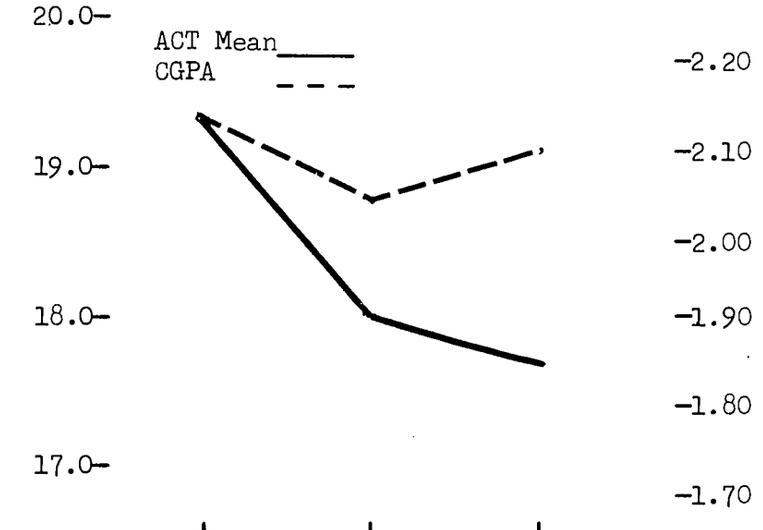
	1964	1965	1966
ACT Mean	18.45	19.46	20.41
CGPA	2.12	2.14	2.18

Figure 1: Relation of Mean ACT Composite and Mean College GPA for 26 colleges increasing most in ACT Mean 1964-1966



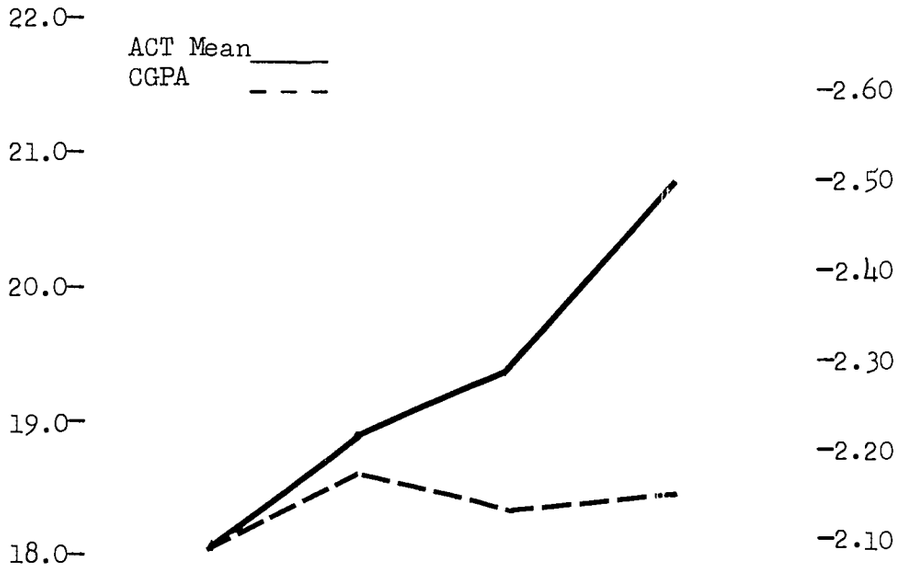
	1965	1966	1967
ACT Mean	18.33	18.66	20.18
CGPA	2.18	2.18	2.20

Figure 2: Relation of Mean ACT Composite and Mean College GPA for 20 colleges increasing most in ACT Mean 1965-1967



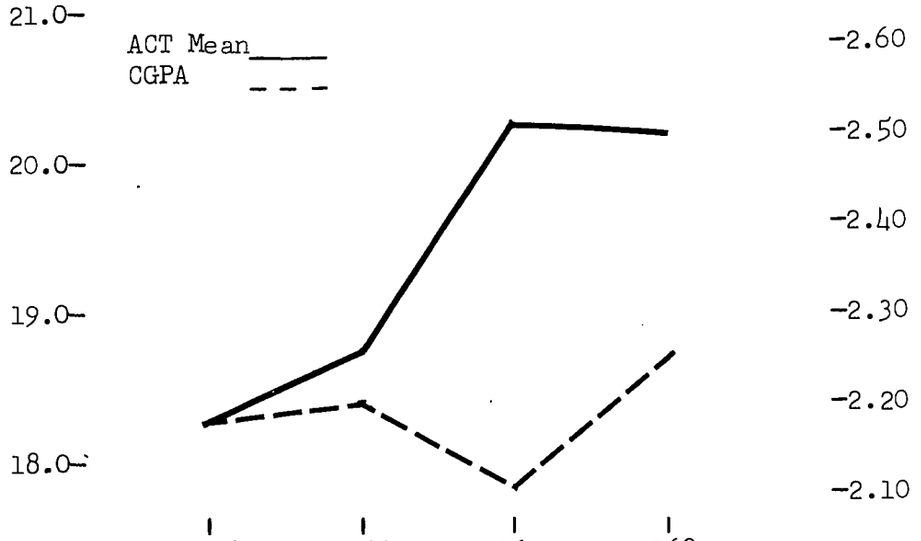
	1966	1967	1968
ACT Mean	19.45	18.03	17.67
CGPA	2.16	2.07	2.12

Figure 3: Relation of Mean ACT Composite and Mean College GPA for 11 colleges decreasing most in ACT Mean 1966-1968



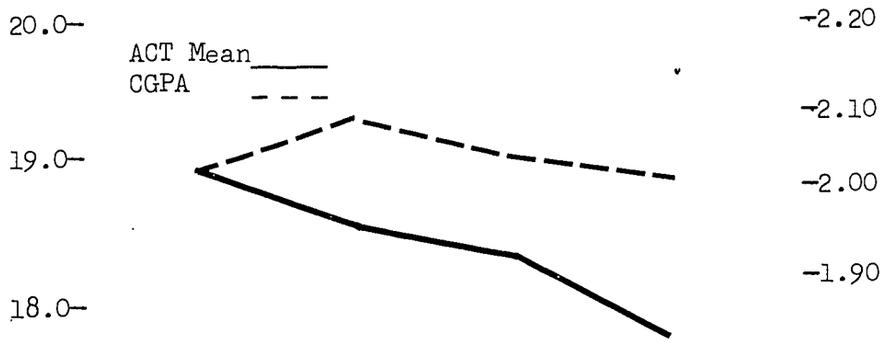
	1964	1965	1966	1967
ACT Mean	18.14	18.85	19.38	20.60
CGPA	2.10	2.18	2.15	2.16

Figure 4: Relation of Mean ACT Composite and Mean College GPA for 10 colleges increasing most in ACT Mean 1964-1967



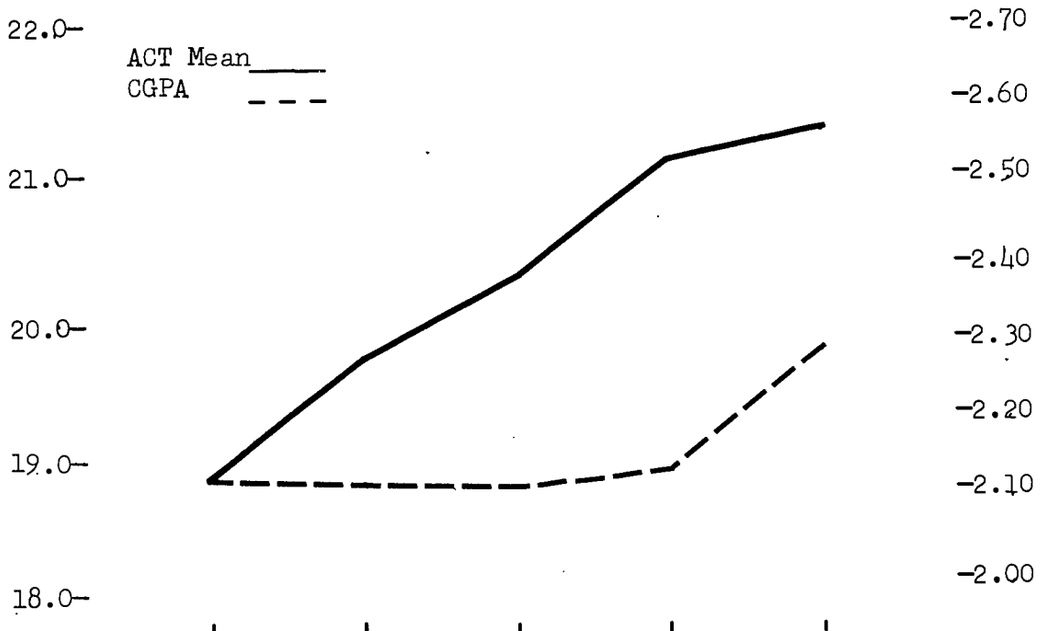
	1965	1966	1967	1968
ACT Mean	18.30	18.62	20.25	20.14
CGPA	2.18	2.19	2.11	2.25

Figure 5: Relation of Mean ACT Composite and Mean College GPA for 15 colleges increasing most in ACT Mean 1965-1968



	1965	1966	1967	1968
ACT Mean	18.97	18.53	18.39	17.83
CGPA	2.03	2.10	2.04	2.01

Figure 6: Relation of Mean ACT Composite and Mean College GPA for 12 colleges decreasing most in ACT Mean 1965-1968



	1964	1965	1966	1967	1968
ACT Mean	18.83	19.75	20.34	21.08	21.23
CGPA	2.14	2.13	2.12	2.14	2.28

Figure 7: Relation of Mean ACT Composite and Mean College GPA for 10 colleges increasing most in ACT Mean 1964-1968