An Exploratory Examination of Grade Inflation at The University of Georgia

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Abstract

This study examined the change in term grade point average (GPA) from 1974 through 2004 for 368,282 undergraduate student records at a large, research-extensive university in the Southeast. Descriptive analyses showed an increase in term GPA and average SAT scores over the 31-year period. Although average SAT and GPA increased, standard deviations decreased. To examine possible factors related to predicted GPA, linear regression models were developed for each year 1984-2004. (years 1974 -1983 were not included due to missing data.) Regression analyses found SAT and receipt of the HOPE scholarship, gender, race, and college of major to play a role in predicted GPA, and contributions of some of these variables varied widely over the 21-year period. While preliminary findings indicate the contributing nature of these variables to the change in GPA, the adjusted R square values are relatively low. Other factors such as changing student and faculty demographics, teaching pedagogy and technology in the classroom may likely be important contributors that were not included in this study.

Introduction

Grade inflation has been a concern for US higher education officials for the past 40+ years. Renewed concerns from both institutional and governmental officials have again caused educators to examine this issue as we attempt to achieve greater efficiency of higher education. Although often intermingled with the related concepts of grade compression and grade disparity (Hu, 2005), grade inflation refers to a rise in a grade or grade point average (GPA) without evidence that it was earned (Bejar & Blew, 1981; Birnbaum, 1977; Breland, 1976). To show that grade inflation exists, it is important to demonstrate that achievement has not increased (or risen at same pace), while grades have increased (Bejar & Blew, 1981 p.143).

A number of factors are cited as causes of, or contributing to, grade inflation. Financial pressure on students, governments and institutions of higher education is one the most frequently cited reasons. Institutions are perceived by some government officials as seeking higher appropriations without a concern for the quality of education they are providing their students. Enrollment-driven funding has created an imbalance in the priorities of publicly funding higher education … student enrollment counts greatly, student achievement counts little (Stone, 1995. In some cases, government officials believe that changes in college grading may not only be responsible for the growing budgets of higher education, but also for lower academic standards (Stone).

Higher education officials, however, are feeling the financial pinch in a different manner and, in some cases, believe that if they do not satisfy student expectations, students will transfer to another school that offers easy grades. In many ways, institutions are responding to the changing market of higher education- one that has become consumer-based. "Students have for higher education exactly the same consumer expectations they have for any other commercial

enterprise. For colleges and universities, survival means satisfying these consumer expectations and keeping tuition dollars coming" (Barndt, 2001, ¶ 12).

Students are also experiencing financial pressures in another manner which some believe leads to grade inflation. "Faculty hesitate to deny students the "B" needed for tax credits" (Reischauer & Gladieux, 1996). In the state of Georgia (state in which the institution for this study is located), questions are being raised as to whether faculty are reluctant to give low grades due to the fact that merit-aid scholarships are only available to students if they maintain a B average. In some cases, if a student loses their tax credit or merit scholarship, s/he will not be able to continue his/her education.

In addition to financial issues, student choice of major has also been examined as an outgrowth of this increased consumer-based higher education. Prather, Smith, and Kodras (1979) found that students are moving into degree programs that reflect their abilities and interests. In doing so, they are finding grading standards and course content to be parallel with their interests, and that leads to greater proficiency, i.e., higher grades.

Along with financial pressures and changes in student choice of major, other possible correlates or reasons for grade inflation include the combination of changing student and faculty demographics, perceptions of the teaching-learning process, and the introduction of technology in the classroom. With SAT scores steadily increasing, even when adjusted for recentering, some scholars argue that the skills and abilities of today's undergraduates exceed those of a generation ago, thus students should be earning higher grades (Student Academic and Financial Affairs Committee of the Academic Senate Georgia Tech, 2003) . Perhaps older faculty, more comfortable with the traditional lecture, resist the wide-scale introduction of technology and/or innovative active learning pedagogies. Students of today look to the internet as their primary

resource for acquisition of knowledge and other research. The individual and/or combined influence of instructor attitudes, instructional techniques, and technologies is likely to influence changes in grades (Hu, 2005).

There is debate among researchers as to the underlying cause of grade inflation. Some cite student ability as the main cause in the rise of grades (Olsen 1997; Hanson, 1998), while others provide evidence that student ability does not account for the rise (Bejar & Blew, 1981; Mullen, 1995; McSpirit & Jones 1999; Rojstaczer, 2003; Merrow, 2004; Wilson, 1999). Kuh and Hu (1999) researching grades over two time periods (mid-80s and mid-90s) and across multiple institutions and majors, found evidence supporting grade inflation only at research universities and selective liberal arts colleges but found grade deflation at general liberal arts colleges and comprehensive colleges and universities and within the humanities and social sciences disciplines. Some other theories examined and asserted as reasons for grade inflation include educational credentialism (Brown, 2001), student consumerism (Farley, 1995; Barndt, 2001, Rosovsky & Harley, 2002), admission of a greater number of unprepared students (Birnbaum, 1977), responding to diversity concerns (in an effort to keep lower SES and minority students on campus, faculty graded them more leniently) (Rosovsky & Harley), faculty giving higher grades in return for higher teaching evaluations (Rosovsky & Harley), and faculty having more interest (and spending more time) with graduate students and research (Merrow, 2004).

While the correlates of grade inflation are of interest, the outcomes of grade inflation are equally concerning. Perhaps the most frequently mentioned concern is the devaluing of the undergraduate degree. Since grades are often used as a method of evaluating the talent/merit of college students, a widespread rise in grades or GPA across the country might make the degree

less valuable, because some individuals (e.g., employers) will have trouble distinguishing who is and who is not an excellent student (i.e. properly prepared for a job, graduate school, etc.).

Another concern is the changing view on what is an acceptable grade distribution. Grade distributions (while the distribution has been skewed toward higher grades for some time, it has become more skewed with As being numerous, Bs common, and Cs, Ds, and Fs infrequent) fly in the face of one of our most deeply cherished educational theories, the bell-shaped curve (Cosgrove, 1995). The curve in fact has become an upward slope with the "Gentleman's' C" becoming the "Gentleman's A" as the percentage of Cs to As appears to have reversed itself (Levine & Cureton, 1998).

Description of the Institution Studied

The University of --- is a large, research-extensive public university located the Southeast portion of the US. As the state's flagship and land-grant university, it offers over 150 degree programs in 13 schools and colleges. The undergraduate student body is comprised (currently approximately 25,000 undergraduates) mainly of traditional age students (18-22 yrs) enrolling primarily from the local region. Starting in 1994, the state of Georgia provided merit-based financial aid (HOPE scholarship) to students who graduate from a Georgia high school and attend either a public or private institution of higher education within the state (Georgia Student Finance Commission, 2005). The HOPE scholarship provides full tuition, approved mandatory fees (i.e., health and student activities fees), and a $300 academic book allowance per year for students enrolled at public institutions. For students attending private institutions, HOPE provides $3000 per year plus the Georgia Tuition Equalization Grant of $900 per academic year (Georgia Student Finance Commission, 2005).

The HOPE scholarship can be earned by graduating Georgia high school seniors who have a 3.0 cumulative grade point average (GPA) or an 80 numeric average for all college prep core curriculum subjects. Students who do not earn HOPE as freshmen can earn it after checkpoints of 30, 60, and 90 semester hours (45, 90, and 120 quarter hours) and must maintain a cumulative GPA above 3.0. Conversely, students can lose HOPE at the 30, 60, and 90 semester hour checkpoints of they do not maintain a 3.0 cumulative GPA (Georgia Student Finance Commission, 2005). Students can receive HOPE through the term in which they reach 127 (semester) attempted hours.

The University of --- officials have observed a rise in SAT scores for incoming first year students over the past 30 years. Simultaneously, campus officials have noted an increase in grades and questions have been raised as to specific factors related to this rise. Research questions guiding this study include:

1. What is the average term grade point average (GPA) for full-time undergraduates at the University of ---for the fall terms 1974 through 2004?
2. What are the demographics of the undergraduate students in these fall terms?
3. Is there a change in GPA and if so, what factors contributed to the increase/decrease in grades? Particular factors to examine include demographics, college of enrollment, SAT score, and receipt and/or loss of the HOPE scholarship (merit-based financial aid)

Sample

The sample for this study consists of 368,282 cases of undergraduate students (144,405 individual students) who completed 12 or more graded hours at the University of --- during the fall terms 1974 through 2004. The data was extracted from official census files. Students were included in the study if they had usable SAT score and term GPA. The entire sample consisted

of, on average, 55% female and 90% White students. All non-white students were grouped together in one ethnic variable (non-white) due to the relatively small number of minority students enrolled at the University of --- during 1974 to 2004.

Variables Included in the Analyses

Previous studies have discussed the influence of increased student preparation levels on grades received by undergraduate students. Factors showing influence include standardized achievement test score (Birnbaum, 1977; Olsen, 1997; McSpirit & Jones, 1999), gender (Birnbaum, 1977; Olsen, 1997; McSpirit & Jones, 1999), high school GPA (Olsen, 1997), class level (Olsen, 1997), and student majors (Birnbaum, 1977; McSpirit & Jones, 1999). In addition, race and merit-based financial aid (presence of HOPE scholarship) were added as factors in our analyses to address research question #3.

Analyses Employed

Descriptive and advanced statistics were completed for this study. Basic descriptive statistics and correlation analyses were completed to provide an understanding of average SAT scores and GPA each year, over time, and the general relationship among GPA, SAT, and demographics of the sample. One of the predominant uses of multiple linear regression is for explanation (Ethington, Thomas, & Pike, 2002). Therefore, multiple regressions were developed to determine the effect each independent variable has on term GPA, the dependent variable. The independent variables included in this analysis were:

- SAT score (as a proxy of student ability). For this analysis, all data for the SAT score variable were re-centered to compensate for the changes made in the scoring of the SAT in the mid 1990s.
- Gender (coded 1 = female, 0 = male)

- Race (as defined as white/non-white; 1 = non-white students, 0 = white students)
- College of enrollment (coded as dummy variables; The College of Arts & Sciences majors were clustered into 6 categories; Biological Sciences, Fine Arts, Physical Sciences, Language & Literature, Social Sciences, and Other)
- Transfer admit (1 = transfer admit, 0 = non-transfer/native admit
- High School GPA
- Presence of the HOPE scholarship (1 = receiving HOPE in term, 0 = not receiving HOPE in term. Note: HOPE began in 1994 and is only available for those subsequent terms)

Because of the introduction of two variables in 1984 (hsgpa) and receipt of HOPE scholarship (1994), regression analyses were completed for 1984 -2004.

Findings

Table 1 delineates mean SAT scores and term GPA, as well as the percentage change for these variables over the previous year and from the initial year of 1974. As shown, the term GPA rose from 2.77 in 1974 to 3.27 in 2004 ($p < .001$). For the first 10 years of the analysis, the term GPA remained relatively stable (1974-1984) before decreasing for a couple of years. In the late 1980s, the term GPA began to rise consistently and has continued to do so through the remaining years of the study.

Figure 1 illustrates the change in average term GPA from 1974 through 2004. Highlighted bars in the chart indicate the beginning of the HOPE scholarship (1994) and the first term after a quarter to semester conversion (1998). Figure 2 charts average SAT scores by fall semester. Average SAT scores rose from 1084 in 1974 to 1201 in 2004 ($p<.001$; all scores recentered). Like term GPA, average SAT scores were similarly unchanged in the first 10 years of the study but remained relatively stable before increasing in the late 1980s. Similar to the rise

in actual term GPA, the increase in SAT scores continued throughout the remaining years of the study.

Table 1
Means and Standard Deviations of Term GPA and SAT Scores

Year	Mean Actual GPA	GPA % change previous year	GPA % change from 1974	SD GPA	Correlation between GPA and SAT	Mean Actual SAT	SAT % change previous year	SAT % change from 1974	SD SAT	N
1974	**2.7719**	0.00%	0.00%	0.7922	0.324	**1084.3**	0.00%	0.00%	139.75	8622
1975	**2.7612**	-0.39%	-0.39%	0.8049	0.338	**1079.6**	-0.43%	-0.43%	139.95	8671
1976	**2.7711**	0.36%	-0.03%	0.7894	0.308	**1076.9**	-0.26%	-0.69%	136.76	8732
1977	**2.7183**	-1.91%	-1.93%	0.8069	0.304	**1074.8**	-0.19%	-0.88%	135.05	9644
1978	**2.7662**	1.76%	-0.21%	0.7975	0.262	**1075.3**	0.05%	-0.83%	133.44	9706
1979	**2.7634**	-0.10%	-0.31%	0.796	0.228	**1079.3**	0.37%	-0.46%	129.29	10109
1980	**2.7631**	-0.01%	-0.32%	0.7778	0.24	**1080.2**	0.08%	-0.38%	127.96	9906
1981	**2.7348**	-1.02%	-1.34%	0.796	0.271	**1076**	-0.39%	-0.77%	126.05	10621
1982	**2.7484**	0.50%	-0.85%	0.7676	0.241	**1081.5**	0.51%	-0.26%	125.82	10066
1983	**2.7362**	-0.44%	-1.29%	0.776	0.245	**1084.5**	0.27%	0.01%	125.75	9529
1984	**2.7642**	1.02%	-0.28%	0.766	0.238	**1080.1**	-0.41%	-0.39%	124.65	9393
1985	**2.6968**	-2.44%	-2.71%	0.7744	0.232	**1079.1**	-0.09%	-0.48%	126.13	9490
1986	**2.656**	-1.51%	-4.18%	0.7856	0.238	**1082**	0.27%	-0.22%	128.34	9633
1987	**2.6891**	1.25%	-2.99%	0.7873	0.247	**1092.7**	0.99%	0.77%	127.88	9686
1988	**2.6891**	0.00%	-2.99%	0.7956	0.231	**1100.3**	0.70%	1.47%	128.93	10599
1989	**2.747**	2.15%	-0.90%	0.7793	0.241	**1105.5**	0.48%	1.95%	128.94	10995
1990	**2.7427**	-0.16%	-1.05%	0.7963	0.246	**1108**	0.22%	2.18%	129.23	12337
1991	**2.7919**	1.79%	0.72%	0.7714	0.236	**1108.6**	0.05%	2.24%	128.06	13225
1992	**2.8354**	1.56%	2.29%	0.7748	0.232	**1117.3**	0.79%	3.04%	129.53	13296
1993	**2.8717**	1.28%	3.60%	0.7829	0.214	**1128.5**	1.00%	4.07%	132.48	12432

1994	**2.9363**	2.25%	5.93%	0.7537	0.238	**1135.1**	0.59%	4.68%	130.52	12923
1995	**2.9808**	1.52%	7.54%	0.7405	0.234	**1146.9**	1.04%	5.77%	131	13454
1996	**3.0193**	1.29%	8.93%	0.7217	0.255	**1154.9**	0.69%	6.51%	130.89	13161
1997	**3.065**	1.51%	10.57%	0.7129	0.257	**1158.4**	0.30%	6.83%	131.01	13838
1998	**3.0758**	0.35%	10.96%	0.7007	0.246	**1166.2**	0.68%	7.55%	130.13	14236
1999	**3.093**	0.56%	11.58%	0.7033	0.241	**1170.8**	0.39%	7.98%	129.55	14439
2000	**3.1505**	1.86%	13.66%	0.6808	0.241	**1175.7**	0.42%	8.43%	128.67	14818
2001	**3.1661**	0.50%	14.22%	0.6781	0.23	**1180.1**	0.37%	8.84%	126.26	15631
2002	**3.1909**	0.78%	15.12%	0.6582	0.248	**1186**	0.50%	9.38%	125.7	16245
2003	**3.2406**	1.56%	16.91%	0.6422	0.265	**1192**	0.50%	9.93%	125.92	16600
2004	**3.2722**	0.98%	18.05%	0.6241	0.261	**1201.1**	0.77%	10.77%	127.55	16245
average	**2.9131**			0.7705	0.308	**1126.5**			136.52	368282

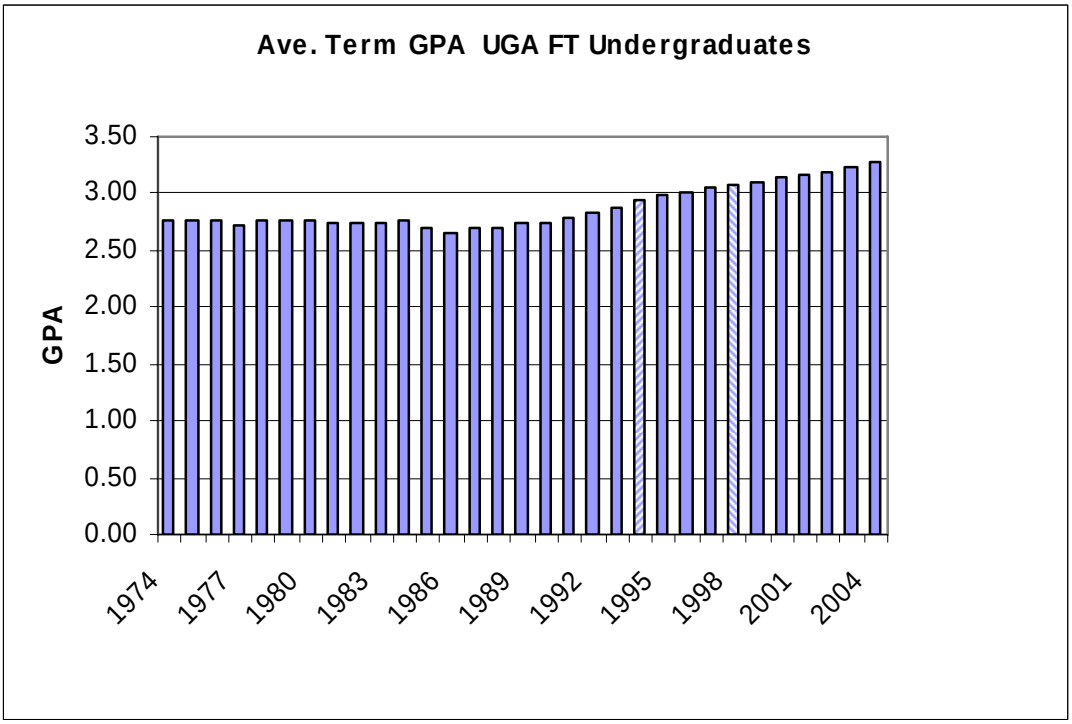

Figure 1
Average Term GPA by Fall Semester

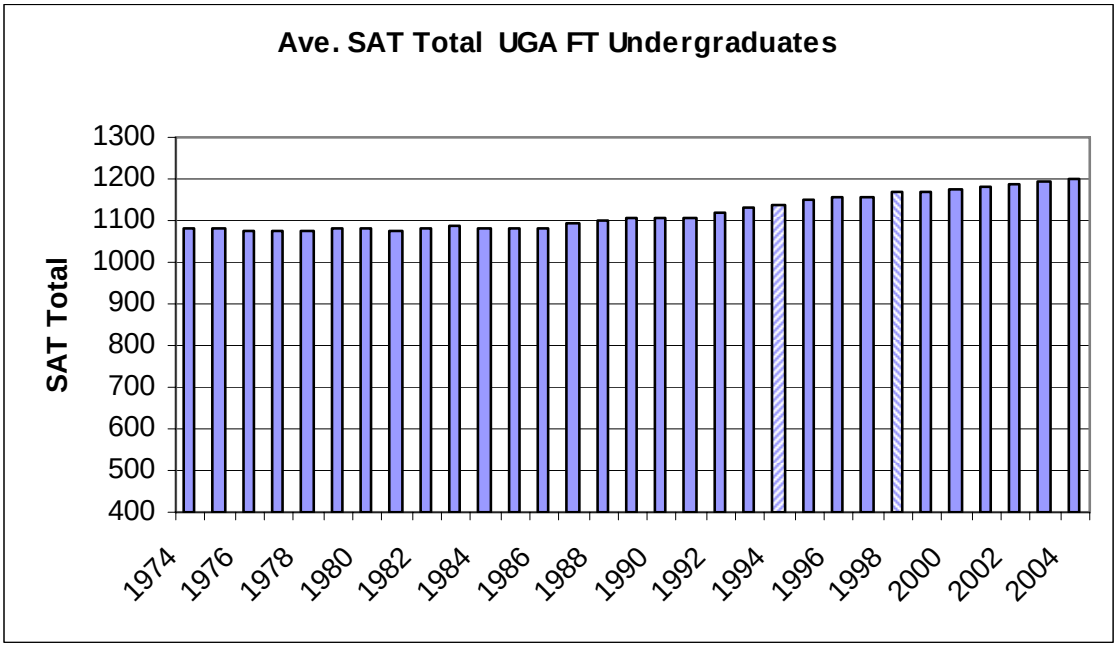

Figure 2
Average SAT Scores

As shown in the Figures 1 and 2 and in Table 1, both term GPA and SAT scores for undergraduates in this sample increased over time. However, in addition to examining the average scores over time, it is important to note the relationship between the variances as well (see Table 1). While SAT scores and GPAs have risen over time, the standard deviation (an indication of the variance among scores) has decreased. This indicates that while grades and SAT scores are increasing, the variation between the scores is decreasing.

The change in scores can also be examined by the percentage of change from the start of the analysis (Figure 3) and percentage of change from the previous year (Figure 4). In Figure 3, change in term GPA is relatively stable until mid 1980s where it decreased before increasing throughout the remaining years. The change in average SAT scores is similar to the change in term GPA and is relatively stable until the mid 1980s where SAT scores increased for the

remaining years. Over the 31 years, the change in term GPA (18.05 %) outpaced the increase in the SAT scores (10.77 %), and the sharpest increase occurred in the last 10 years (1994-2004).

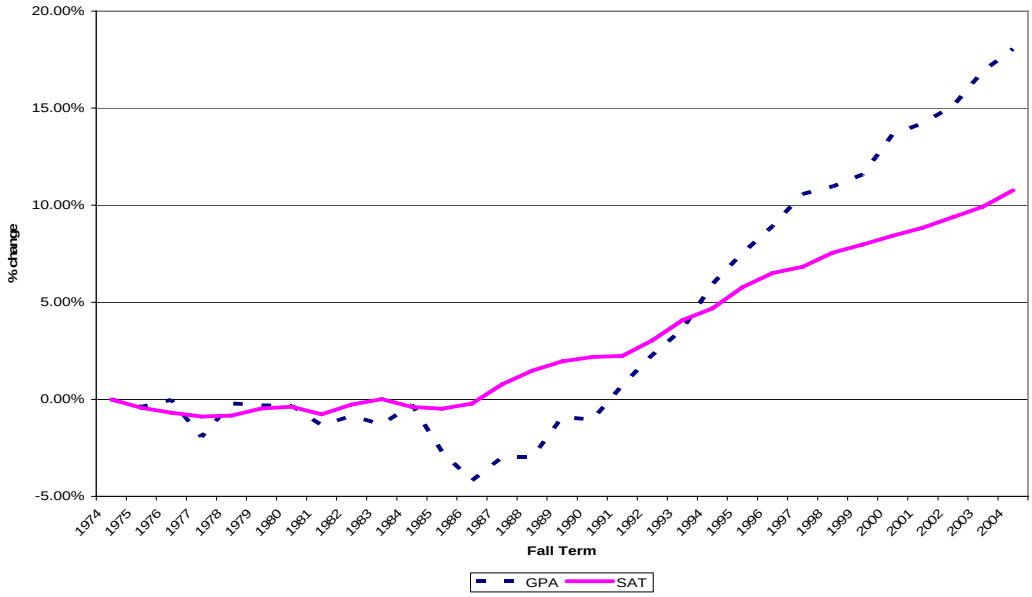

Figure 3
Percent Change from 1974 to 2004

Figure 4 shows the change in average term GPA and SAT scores on a year-to-year basis. SAT scores have increased every year since the mid 1980s, while term GPA began to increase from the mid 1990s forward. While both of these increases have been positive, the patterns have differed slightly. SAT scores have shown steady increase between .05 to .10 percent change on a year-to-year basis, but term GPA increase has been more varied from .04 to 2.25 percent change on a year-to-year basis.

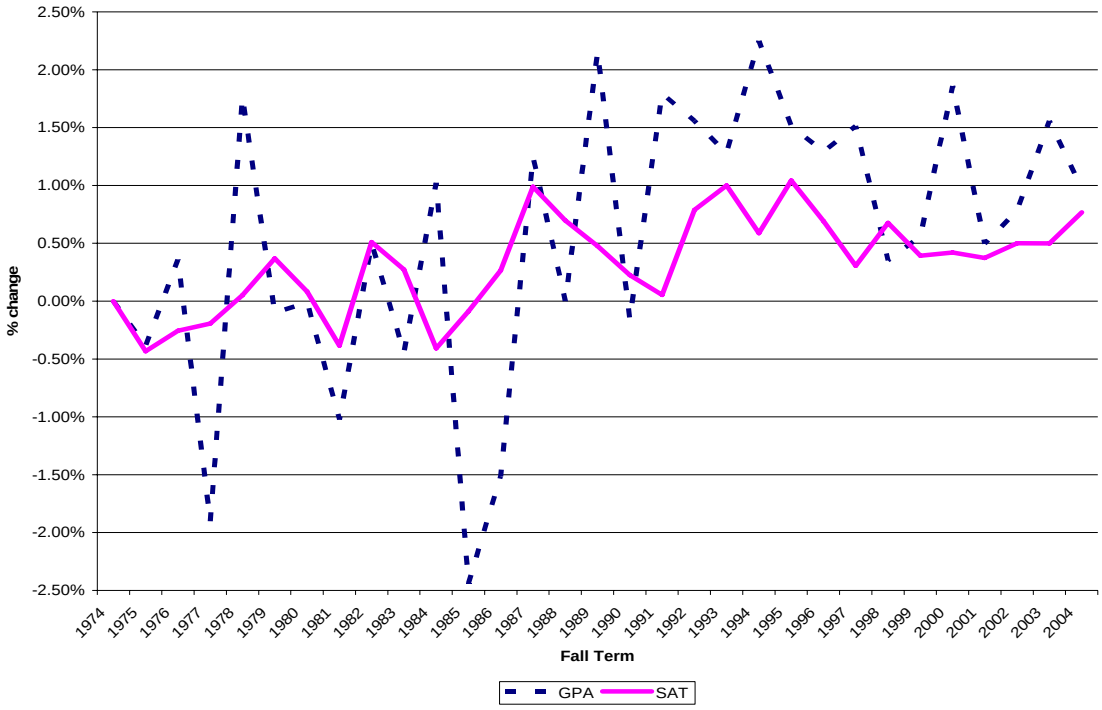

Figure 4
Percent Change From Previous Year

Table 2 displays a correlation matrix for select variables in this analysis. The Pearson correlation value between term GPA and SAT is .310 ($p < .001$), indicating a significant but not highly positive relationship between the increase in term GPA and SAT total score from 1974 through 2004. Not surprising, correlation values between high school gpa, term GPA, SAT, and receipt of HOPE scholarship are positive and significant. Correlation analyses indicate no highly significant relationship between academic ability measures and student gender or race.

Table 2
Correlations between student background variables

		Gender	Ethnicity	Term GPA	SAT Score	HS_GPA	HOPE
Gender	Pearson Correlation	1	0.050	0.140	-0.100	0.183	0.071
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000
	N	367687	364539	367687	367687	244909	161034

Ethnicity	Pearson Correlation		1	-0.060	-0.120	0.028	-0.041
	Sig. (2-tailed)			0.000	0.000	0.000	0.000
	N		364877	364877	364877	243081	158929
Term GPA	Pearson Correlation			1	0.310	0.427	0.308
	Sig. (2-tailed)				0.000	0.000	0.000
	N			368282	368282	245377	161590
SAT Score	Pearson Correlation				1	0.396	0.224
	Sig. (2-tailed)					0.000	0.000
	N				368282	245377	161590
HS_GPA	Pearson Correlation					1	0.406
	Sig. (2-tailed)						0.000
	N					245377	151462
HOPE	Pearson Correlation						1
	Sig. (2-tailed)						
	N						161590

Note: All correlations significant at the 0.01 level (2-tailed)

Regression Analyses

In order to more fully examine the contribution of certain variables to GPA as well as the relationship between actual and predicted GPA, Table 3 displays results of actual versus predicted term GPAs. Because data for high school GPA was not available prior to 1984, regression analyses shown here are based on data 1984 through 2004 (N=242,800 records).

Table 3
Actual vs. Predicted GPA

Term	Actual Term GPA	Predicted Term GPA
1984	2.667	2.721
1985	2.634	2.697
1986	2.642	2.695
1987	2.687	2.692
1988	2.684	2.700
1989	2.743	2.716
1990	2.734	2.713

1991	2.789	2.722
1992	2.832	2.751
1993	2.864	2.785
1994	2.938	2.890
1995	2.982	2.963
1996	3.025	3.010
1997	3.071	3.040
1998	3.083	3.084
1999	3.103	3.116
2000	3.161	3.142
2001	3.179	3.156
2002	3.203	3.175
2003	3.250	3.192
2004	3.281	3.215

As shown in Table 3, predicted term GPAs are slightly higher than actual values in early years (1984-1988) but slightly lower in more recent fall terms (1989-2004). The regression model overpredicts term GPA in the early years but then underpredicts term GPA in the more recent terms (most terms 1989 – 2004). Results indicate that holding constant for the variables (SAT, gender, race, hsgpa, college of major, transfer status and receipt of HOPE) grades are increasing more than we would predict.

Table 4 (located at end of paper) lists the unstandardized regression coefficients for the comprehensive model (1984-2004) and for each individual year. The comprehensive model is helpful in allowing us to compare the contribution of a variable over the 20 year time period. An examination of unstandardized coefficients each year gives insight into the relative amount of contribution for that variable and if the contribution changes over the 20 year period. For example, as shown in Figures 5 through 8, many of the unstandardized B coefficients are changing over the 20 year period. This indicates a change in the relative contribution of this variable in predicting term GPA. For example, the coefficient value for gender approximately doubles over time and thus its subsequent more important contribution to the GPA prediction.

Similar changes are seen in Figures 6 through 8 for Agriculture, Social Work, and receipt of the HOPE Scholarship.

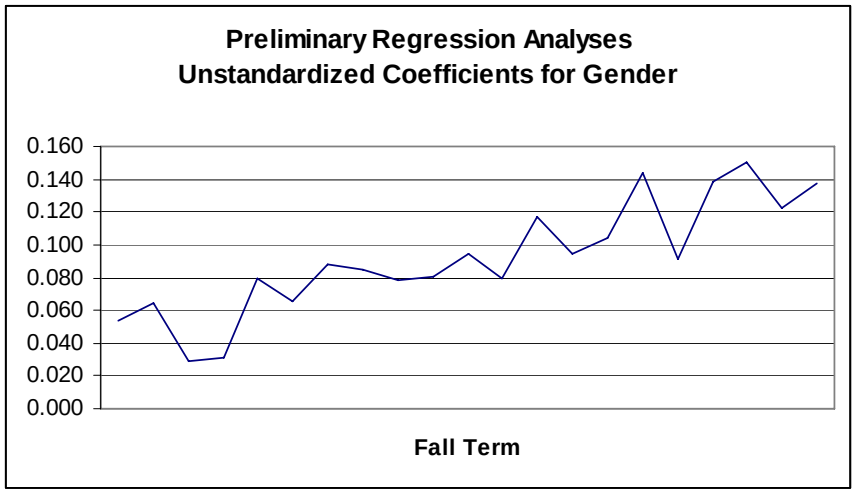

Figure 5
Unstandardized Coefficients for Gender 1984-2004

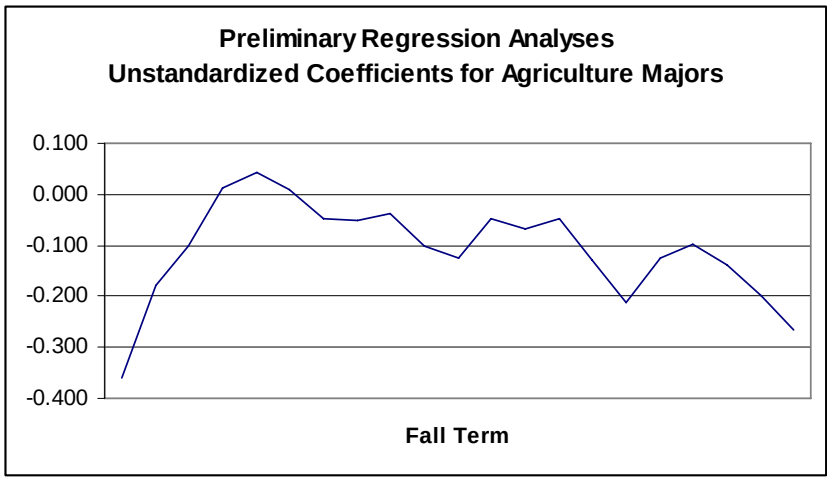

Figure 6
Unstandardized Coefficients for Agricultural Majors 1984-2004

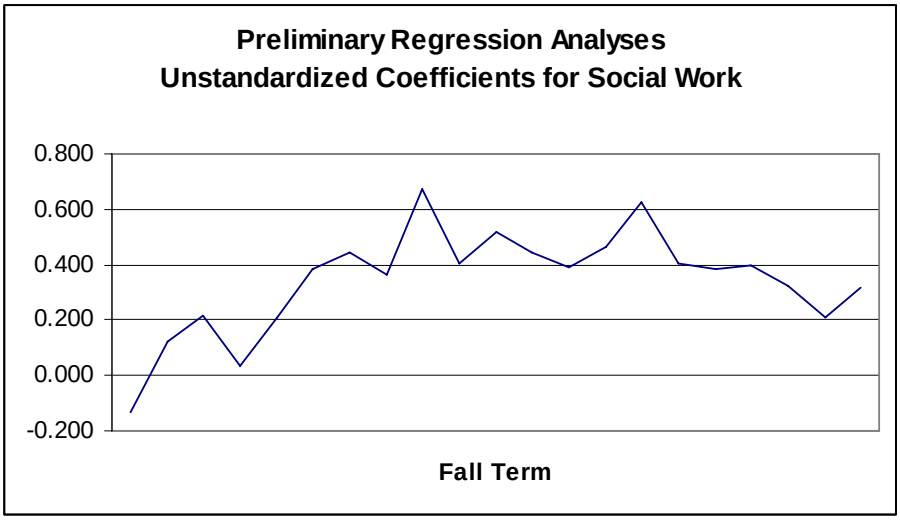

Figure 7
Unstandardized Coefficients for Social Work Majors

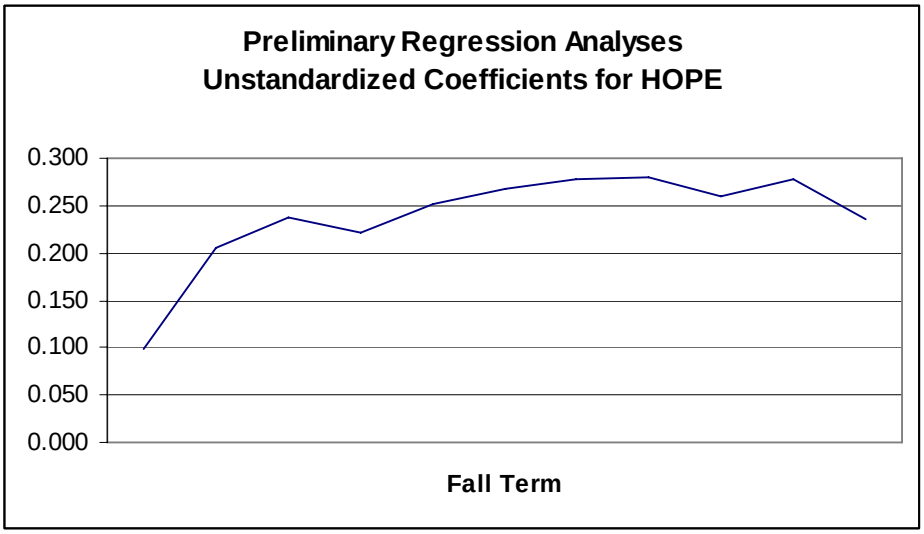

Figure 8
Unstandardized Coefficients for HOPE Scholar Recipients (1995-2004)

Discussion

Findings from this study point to three main conclusions. First, moving from 2.77 in 1974 to 3.27 in 2004, the average GPA earned by students in this sample has risen in the past 31 years. As shown in Table 1, much of the 18% increase occurred in the past 10-15 years. However, it was in the late 1980s when the grades began to increase on a yearly basis. This is

consistent with Kuh and Hu (1999) findings that grades of students with similar background characteristics in the mid-1990s were higher than in the mid-1980s.

Second, findings from the regression analyses show a difference between the actual and predicted term GPA, with actual GPA lower than predicted in the earlier years (1984-1988) but actual GPA higher than predicted in more recent years (model overpredicts in early years; underpredicts in more recent years). Unstandardized B coefficients were examined across each year to examine change in relative contribution if it existed. Close examination of the changing coefficient values leads us to assert that the changing distribution of students by the variables included in our analyses are having a substantial effect on the predicted GPA values. These analyses don't allow us to pinpoint the exact source, but they do provide some insights. For example, our data parallels that of other researchers who report female undergraduates earn higher grades than their male counterparts. Similarly, the shifts in demand for certain majors may also influence the GPA. Coefficients also show that the relative contribution of HOPE scholarship increases in value over the years 1994-2004. The combination of shifts in gender composition and college major, number of transfer students, and/or receipt of HOPE scholarship influence the contribution of each in predicting GPA.

Third, the increase in grades over the 31 years of this study appears to be a combination of a number of variables. Although the literature suggest that student background characteristics, student ability, and college of enrollment will explain a good bit of the variance of grades, the low R-square values in the preliminary regression analyses account for only about 20-24 % of the variance, indicating other factors might be influencing grades. Table 5 includes a list of possible factors, many of which are complex and not easy to quantify.

Changing demographics of the student body may be influencing grades received. Within the sample, the population has shifted from a majority of male (51% in 1974) to one that is majority female (57% in 2004). The unstandardized coefficients in all regression models developed show a positive coefficient indicating females earn higher GPAs than males. Non-white students now make up over 14% of the student population, up from just 4% in the mid 1970s. However, the negative beta coefficient indicates that non-white students earned lower grades than whites. With the growing number of females and non-white students within the study body, the possibility that these characteristics are influencing grades is likely.

Clearly, student ability as defined by SAT scores has increased over the 31 year period. However, this increase is not at the same pace as the increase in term GPA. Examining these descriptive changes might lead one to reach the conclusion that grade inflation exists, but we're not certain that the answer is that simple. The regression analyses show there is much unaccounted for variance in predicted GPA and the relative contribution of the variables included varies over the 21 year period. These two findings taken together lead us to the conclusion that the influence of SAT, HS GPA, gender, race, and college of major are important yet only a part of the full answer.

Many other factors may contribute, and many of these are hard to quantify. For example, many students now enroll in SAT/ACT preparation classes for the sole purpose to raise their test scores. While these preparation classes raise student's scores, do they really improve the level of knowledge of a student? With the issues associated with standardized tests as a measure of student ability, to conclude that grade inflation has or has not occurred based solely on the percentage change of SAT scores and term GPA cannot be accurate.

In addition, students may be able to manipulate their grade by judiciously choosing classes they take. Students may be able to "game" the system to their advantage by enrolling in courses and withdrawing before scores are posted. Based on more generalized data from IR Fact Books at this institution, we see that undergraduates had a higher rate of withdrawals in the past ten years compared to earlier years. Are students learning to keep their GPA up by withdrawing at the last moment?

Changes in faculty demographics, attitudes toward teaching, and/or the distribution of faculty (by level of courses taught) may also contribute. In 1974, 51% of the lower level undergraduate courses were taught at UGA by either full, associate, or assistant professors. In 2004, only 44% of lower level undergraduate courses were taught by full, associate, or assistant professors. For upper division courses in 1974, 78% of undergraduate course were taught by full, associate, or assistant professors. In 2004, 66% of upper level undergraduate courses were taught by full, associate, and assistant professors. These shifts indicate that more undergraduate students are being taught by part-time faculty and graduate students in the later years of this study. This shift away from the traditional professorial faculty coincides with rising grades. Do part-time faculty and graduate assistants assign higher grades?

The rewards for faculty to teach and teach well on a research-extensive campus may be decreasing over the years. Faculty promotion is very dependent on the faculty member's research, not necessarily their ability as an instructor. A faculty member who is a good researcher is well known throughout their field while a good teacher, is usually only well known on their campus. While the faculty rewards system has been in place for some time, the financial incentives through research contracts, grants, and even salary available has grown tremendously

in the later part of this study. This suggests that the role of rewards for faculty to teach needs to be considered.

The American Academy of Arts and Sciences commissioned a report to investigate grade inflation (Rosovky & Hartley, 2002). One of the causes suggested is that faculty members are giving higher grades in return for higher teaching evaluations. Johnson's (2003) findings also support this notion. A faculty member not wanting to or having the time to deal with undergraduate students can give higher grades to appease them. This undoubtedly casts the faculty member in a more positive light in the eyes of the undergraduate student. This indicates that the correlation of positive faculty evaluations and grades given needs to be taken into account.

For contextual issues, pedagogical changes since 1974 have most assuredly affected course content, method of teaching, and criteria for evaluation for every discipline. While for some disciplines this change has been relatively small, for others the change has been tremendous. Students and faculty now communicate and learn via internet, email, PowerPoint, and with digitized libraries have more access to information than ever before. Does access to information necessarily equate to more learning? The difficulty in capturing these changes and their direct impact on learning in a quantifiable manner gives credibility to the notion that this issue needs to be considered.

Limitations

Findings from this study are limited in several ways. First, this study's sample was drawn from a single institution, thus generalizations to students at other institutions can not be made. Second, analyses presented assume that the courses students have enrolled in are similar in content and instructional methodology over the period. We recognize that pedagogical

changes within some fields have been dramatic over the past 30 years and how to capture this dynamic was discussed at length, but no adequate measure was devised (or conceived).

Third, changes in the demographics of the institution have occurred over the 30 year period and many of these changes are difficult to quantify in a study as such as this. We recognize shifts in the percentage of students by gender and race (Table 1) and the relative contribution of college of major, likely in part due to shifts in distribution of students by major.

Average SAT scores were used as a proxy for student ability in this study. However, the use of SAT scores as a measure of student ability does have its limitations, yet another adequate alternative eluded us. Standardized achievement tests (e.g., SAT) are designed to predict first year GPA for students, not necessarily to describe the level of ability of a student.

Concerns about collinearity are raised due to the mix of variables included in the regression analyses. A prime example is the receipt of the HOPE scholarship (in first year of college) which is dependent on high school grades. Collinearity statistics (VIF and tolerance statistic) were developed for each of the independent variables for all the regressions (whole model 84-04 as well as for each individual year) and all fell within acceptable ranges (VIF around 1.0 and tolerance above .5 for all variables). The collinearity diagnostic also shows evidence supporting the notion that no dependency between variables exists. Finally, a re-check of the correlations between variables shows no correlations between these variables higher than .428. (For complete collinearity and diagnostic statistics for any of the regression models, please contact the authors directly).

The time dimension of the study calls for an examination of the estimated standard errors which, if violated, would cause the estimated standard errors to be biased downward. This would lead researchers to mistakenly declare a coefficient significant when in fact it is not

(Ethington, Thomas, & Pike, 2002). The Durbin-Watson autocorrelation statistic for each of the models was around 2.0, with the lowest score showing in the 1.5/1.6 range. This finding indicates the assumption of independent errors has been met.

Implications

In responding to the question on whether there is grade inflation found in this study the answer is not a clear one. While it appears that an increase in grades has outpaced the increase in ability (SAT score), to definitively state that grade inflation is occurring in this study is not appropriate. The low R-square values indicate likelihood that there are number of factors outside of the models that are contributing to the grades students receive. This study has identified a number of those factors, but faces a real challenge in defining how to measure those other factors.

The American Academy of Arts and Sciences report on grade inflation (Rosovky & Hartley, 2002) offers the best piece of advice in stating that "each institution has to determine and be responsible for its own standards, and the best beginning is awareness of the issues" (p.1). Results of this study can assist IR professionals to determine the major issues for his/her campus and guide campus discussions on changes in grade. In addition to the contributing factors discussed above, another question to include in the discussion would be "do grades actually tell us how well students are doing?" For example, at the University of ---, does the rise in the term GPA really indicate grade inflation, or is the change in grades a tangled mix of many factors? In light of findings and implications, researchers in this study urge caution in interpretation and further study with additional factors related to grade inflation.

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Table 5
List of possible contributing factors for grade inflation

Students:

- Changing demographics of student body
  - In '04, UGA's student body is more female than male; in '74 the opposite
  - Changing distribution of majors – some majors have higher GPA than other majors
  - Level of preparedness of students
  - % of students who are international students
- Increased attention & sensitivity to personal crisis situations of students
- Students are able to withdraw from courses in which they are receiving poor grades before a grade is recorded into the transcript
  - Question about change in # of withdrawals over time (see grade distribution)
- Students are able to manipulate their GPA through judicious choice of classes
  - How does information such as "the key" affect student choice of courses?
    - Key was started in 94-95
  - How does student choice of majors affect classes enrolled in and grades?
- Student financial situations
  - Students influence faculty to give higher grades – not to loose scholarships
  - HOPE
    - Does receipt of HOPE influence student's course choices?
    - Do students with HOPE try to persuade faculty for higher grades?
- Academic load of students
- Applied skills versus learning for sake of learning (liberal learning)
  - Students taking courses for applied skills learned
- Grade distribution
  - What is the distribution of As, Bs, Cs, Ds, Etc. over the 30 year period?
  - Changes in grades over the years by:
    - Class level
    - Transfer student status
- What are the GPAs over the 30 year period by major/college/department?

Context:

- Pedagogical changes within fields
- Institutional pressures to retain students
  - Cheaper to keep students than recruit students to replace students who drop out
- Technology changes course content & delivery
- Content deflation
  - Ex: large class sections provide incentive to lower # of assigned papers, homework, and expectations of reading
- Institutions changing mission
- Has criteria shifted for grading? Regardless of student ability?
- When UGA President in the 1990s made decision/statement to begin restrictive admissions, did changes in GPA/SAT occur after that?

Table 5, continued

Faculty:

- Faculty attitudes toward teaching
  - The more research intensive an institution becomes, the less attention paid to teaching
  - Faculty rewards – are faculty rewarded for good teaching? Or more for their research?
- Changes in grading policies and practices
  - Ex: use of internship, group work inside courses, etc.
- Changes in use of subjective/motivational factors in grading
  - Ex: student effort, class participation, etc.
- Higher grades are used by faculty to obtain higher evaluations of teaching
  - How do evaluations get used by departments/colleges?
    - '90s, only a portion of the evaluation was completed by all courses taught by faculty (in some colleges)
    - Changes over the 30 years?
- Changing demographics of faculty
  - Differences between senior/junior faculty
    - Changes in % (& #) of tenure/non-tenured faculty
    - GPAs in course taught by tenured/non-tenured faculty (2nd part of analysis?)
  - % of change of gender/race of faculty over the 30 year period?
- What are the criteria for grades to be assigned?
- Does faculty give different grades based on gender/race?
  - Based on demographics of students?
  - Based on demographics of faculty themselves?
- Shifting of teaching burden
  - Changes in Credit hours generated by non-tenured/tenured faculty?

Table 4
Unstandardized B Coefficients

Year	R	R-square	Constant	Gender	White/Non-White	SAT	Journalism	Agricul	Education	Family	Forest	Social
Whole Model 84-04	0.511	0.262	0.197	0.098	-0.122	0.001	0.309	-0.092	0.224	0.150	-0.061	0.420
1984	0.500	0.250	0.064	0.054	-0.157	0.001	0.080	-0.360	-0.209	-0.213	-0.537	-0.135
1985	0.475	0.225	-0.135	0.064	-0.207	0.001	0.306	-0.178	0.105	0.038	-0.295	0.119
1986	0.482	0.233	-0.226	0.029	-0.212	0.001	0.304	-0.103	0.301	0.226	-0.226	0.216
1987	0.481	0.232	-0.151	0.031	-0.096	0.001	0.323	0.013	0.363	0.290	-0.148	0.036
1988	0.462	0.214	-0.035	0.079	-0.144	0.001	0.426	0.043	0.379	0.304	0.053	0.209
1989	0.456	0.208	0.001	0.065	-0.153	0.001	0.404	0.011	0.404	0.271	0.157	0.382
1990	0.456	0.208	-0.063	0.088	-0.169	0.001	0.374	-0.046	0.347	0.289	-0.047	0.447
1991	0.433	0.187	0.210	0.085	-0.153	0.001	0.361	-0.050	0.352	0.244	-0.171	0.361
1992	0.447	0.200	0.200	0.078	-0.172	0.001	0.378	-0.037	0.328	0.287	0.001	0.671
1993	0.431	0.186	0.333	0.081	-0.137	0.001	0.395	-0.100	0.311	0.306	-0.032	0.406
1994	0.451	0.203	0.382	0.094	-0.165	0.001	0.319	-0.126	0.226	0.173	-0.116	0.518
1995	0.464	0.215	0.548	0.079	-0.176	0.001	0.293	-0.047	0.271	0.277	-0.052	0.445
1996	0.455	0.207	0.629	0.117	-0.169	0.001	0.318	-0.069	0.253	0.189	-0.054	0.391
1997	0.456	0.208	0.504	0.094	-0.078	0.001	0.279	-0.048	0.260	0.210	-0.027	0.462
1998	0.467	0.218	0.493	0.104	-0.093	0.001	0.263	-0.129	0.089	0.115	-0.042	0.626
1999	0.474	0.225	0.322	0.144	-0.107	0.001	0.236	-0.213	0.098	0.078	-0.110	0.402
2000	0.458	0.210	0.500	0.091	-0.126	0.001	0.302	-0.126	0.127	0.124	-0.052	0.385
2001	0.459	0.211	0.453	0.138	-0.082	0.001	0.375	-0.099	0.178	0.113	-0.046	0.399
2002	0.464	0.216	0.419	0.150	-0.118	0.001	0.251	-0.139	0.115	0.019	-0.100	0.322
2003	0.476	0.226	0.380	0.122	-0.101	0.001	0.177	-0.197	0.049	-0.088	-0.149	0.211
2004	0.472	0.223	0.469	0.137	-0.106	0.001	0.139	-0.266	-0.005	-0.094	-0.154	0.315

Table 4,
continued

Year	Environ	A&S Bio	A&S F Art	A&S L&L	A&S Phy	A&S Soc	A&S other	SPIA	HS GPA	transfer	Hope
Whole Model 84-04	0.231	-0.057	0.150	0.059	-0.160	0.043	-0.101	0.066	0.435	0.118	0.227
1984	-0.255	-0.199	-0.138	-0.157	-0.349	-0.235	-0.461		0.459	0.144	
1985	0.174	0.000	0.025	-0.004	-0.214	-0.061	-0.194		0.467	0.168	
1986	0.210	0.026	0.134	0.039	-0.115	0.033	-0.147		0.498	0.208	
1987	0.145	-0.006	0.152	0.005	-0.113	0.048	-0.166		0.496	0.166	
1988	0.190	-0.056	0.171	0.114	-0.074	0.122	-0.146		0.480	0.120	
1989	0.132	-0.055	0.250	0.161	-0.013	0.091	-0.112		0.460	0.160	
1990	0.241	-0.098	0.196	0.112	-0.149	0.118	-0.152		0.448	0.103	
1991	0.264	0.001	0.213	0.128	-0.096	0.113	-0.050		0.444	0.112	
1992	0.264	-0.048	0.130	0.099	-0.064	0.077	-0.106		0.464	0.145	
1993	0.209	-0.088	0.148	0.095	-0.191	0.055	-0.168		0.443	0.108	
1994	0.099	-0.100	0.119	0.016	-0.250	-0.001	-0.116		0.450	0.140	0.098
1995	0.204	-0.051	0.118	0.033	-0.185	0.066	-0.100		0.418	0.102	0.206
1996	0.229	-0.045	0.174	0.069	-0.109	0.024	-0.063		0.312	0.089	0.238
1997	0.369	-0.054	0.186	0.059	-0.109	0.055	-0.092		0.360	0.086	0.222
1998	0.196	-0.121	0.124	0.044	-0.258	0.005	-0.112		0.393	0.077	0.251
1999	0.177	-0.180	0.105	-0.047	-0.226	0.004	-0.134		0.418	0.126	0.268
2000	0.235	-0.028	0.139	-0.038	-0.162	0.024	-0.084		0.394	0.072	0.277
2001	0.345	-0.006	0.195	0.134	-0.095	0.082	-0.010		0.382	0.096	0.279
2002	0.228	-0.036	0.152	0.026	-0.167	-0.015	-0.084	0.039	0.383	0.055	0.260
2003	0.229	-0.112	0.106	-0.019	-0.233	-0.046	-0.107	-0.040	0.399	0.060	0.277
2004	0.105	-0.139	0.028	-0.068	-0.252	-0.119	-0.147	-0.078	0.404	0.029	0.236