



**Change in Undergraduate
Term Grade Point Average (GPA) 1974-2004**

Final Report Submitted to Educational Affairs Committee

Karen Bauer, Director
Charles Mathies, Graduate Assistant

November 1, 2005

Introduction

At the request of The Educational Affairs Committee (EAC), the Office of Institutional Research initiated an examination of the change in fall term grade point average (GPA) for undergraduate students at The University of Georgia. This study is based on full-time undergraduate status (≥ 12 hours enrolled) for whom a valid SAT math and verbal and/or ACT score are stored in the student record system. SAT scores prior to 1995 were re-centered to reflect consistency with post 1995 scores. The data set includes fall term GPA scores for 397,385 students (unduplicated $N=149,265$).

Demographic and Exploratory Analyses

The following table and figure show undergraduate GPA for each fall term 1974 through 2004. As shown, the average GPA remained fairly constant from 1974 through 1989 (about 2.74), but then gradually increased from 1989 through 2004 (to about 3.24).

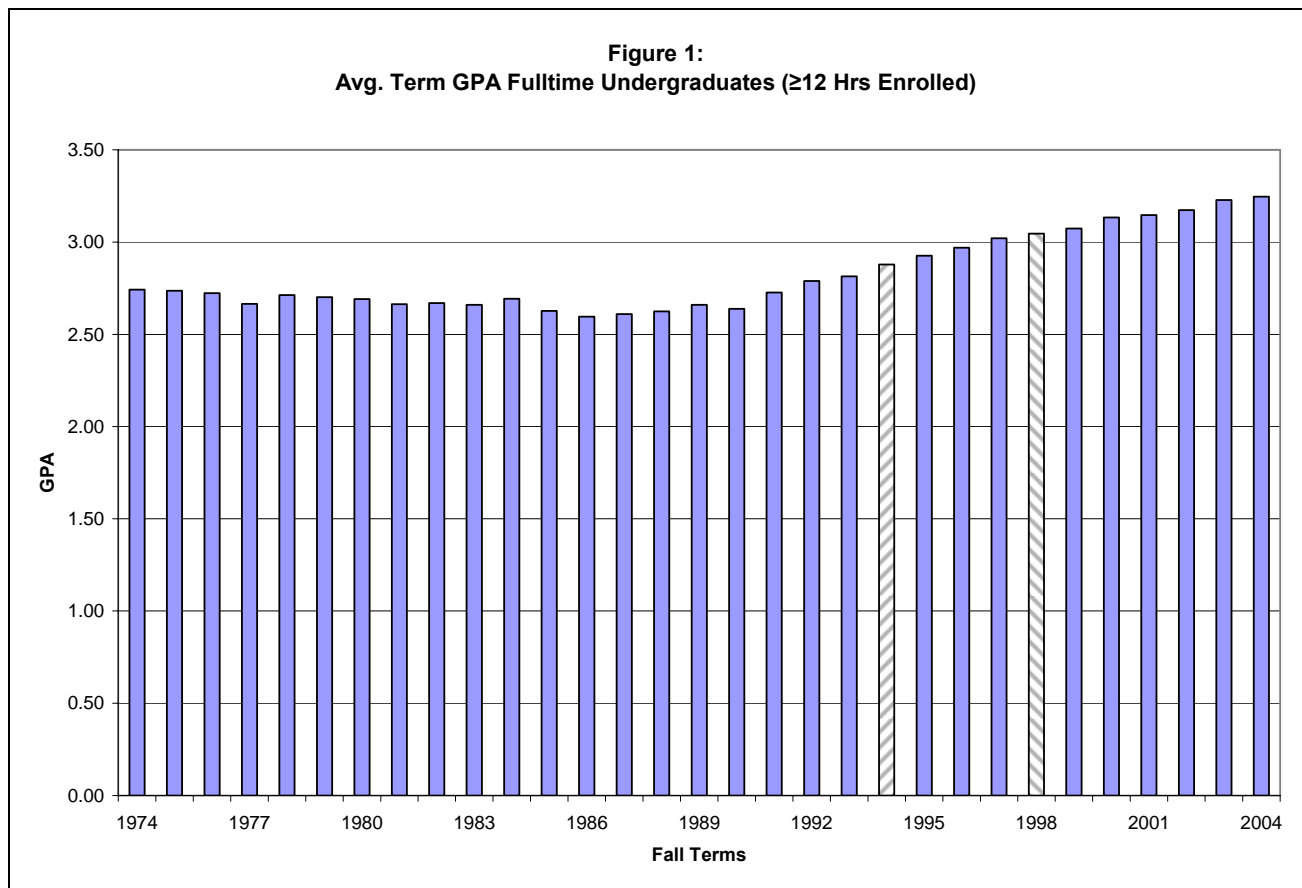


Table 1: Average GPA by Fall Term

Term	Mean	N	Std. Deviation
1974	2.74	8798	0.834
1975	2.74	8840	0.841
1976	2.72	9045	0.853
1977	2.66	10067	0.880
1978	2.71	10203	0.867
1979	2.70	10655	0.882
1980	2.69	10541	0.879
1981	2.66	11315	0.894
1982	2.67	10764	0.875
1983	2.66	10230	0.881
1984	2.69	10078	0.867
1985	2.63	10155	0.872
1986	2.60	10234	0.870
1987	2.61	10436	0.896
1988	2.62	11325	0.885
1989	2.66	11921	0.902
1990	2.64	13549	0.936
1991	2.73	14630	0.861
1992	2.79	14167	0.843
1993	2.81	13601	0.851
1994	2.88	14255	0.823
1995	2.93	14653	0.805
1996	2.97	14341	0.788
1997	3.02	15132	0.775
1998	3.05	15334	0.740
1999	3.07	15694	0.729
2000	3.13	16192	0.703
2001	3.15	17222	0.709
2002	3.17	17733	0.690
2003	3.23	18091	0.670
2004	3.25	18184	0.667

Figure 2 and Table 2 below show comparable changes in SAT total score over time. As shown, SAT scores have gradually but steadily increased over time. The average SAT score hovered around 1070s-1080s from 1974 through 1986, and then began to climb in 1987.

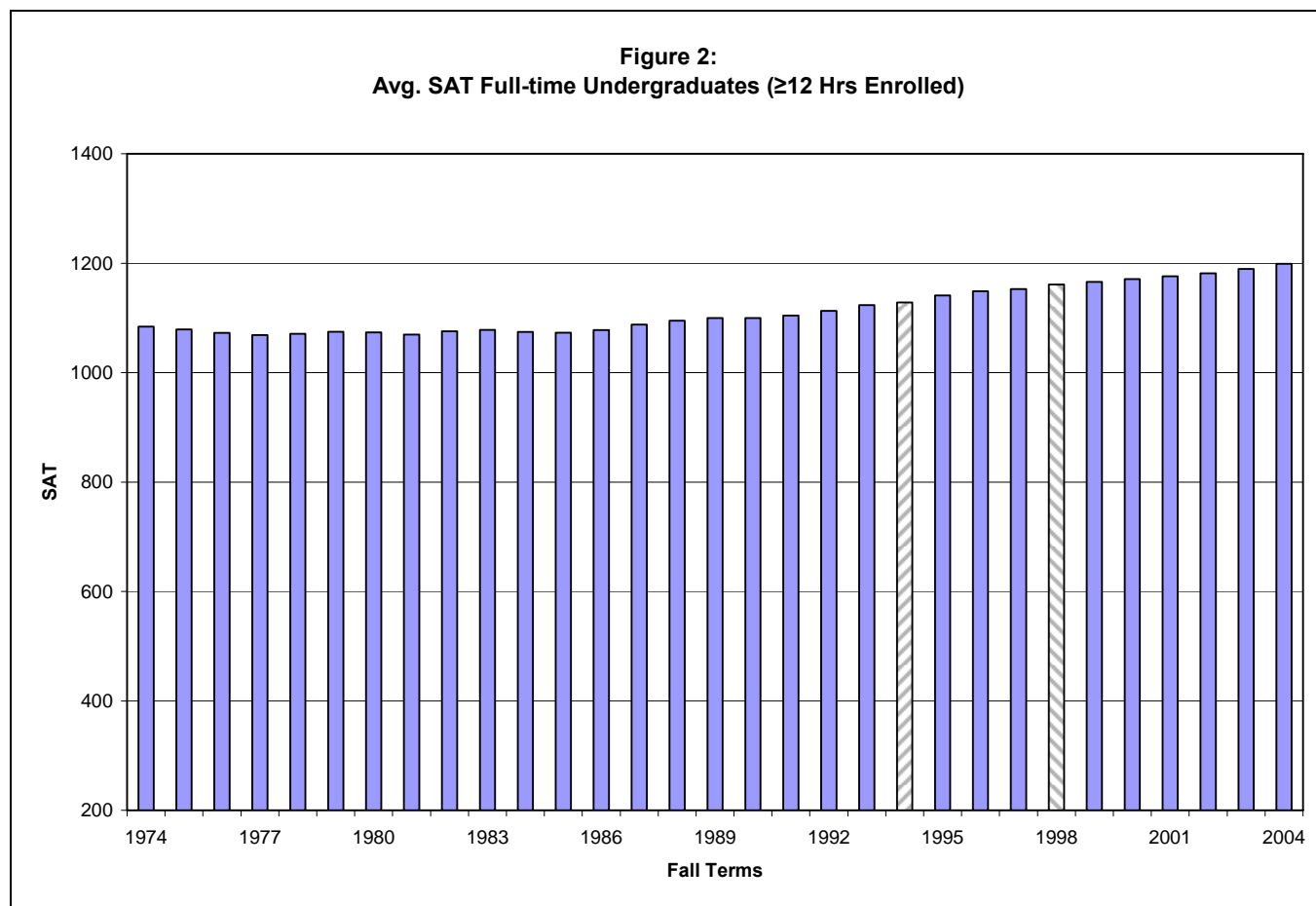


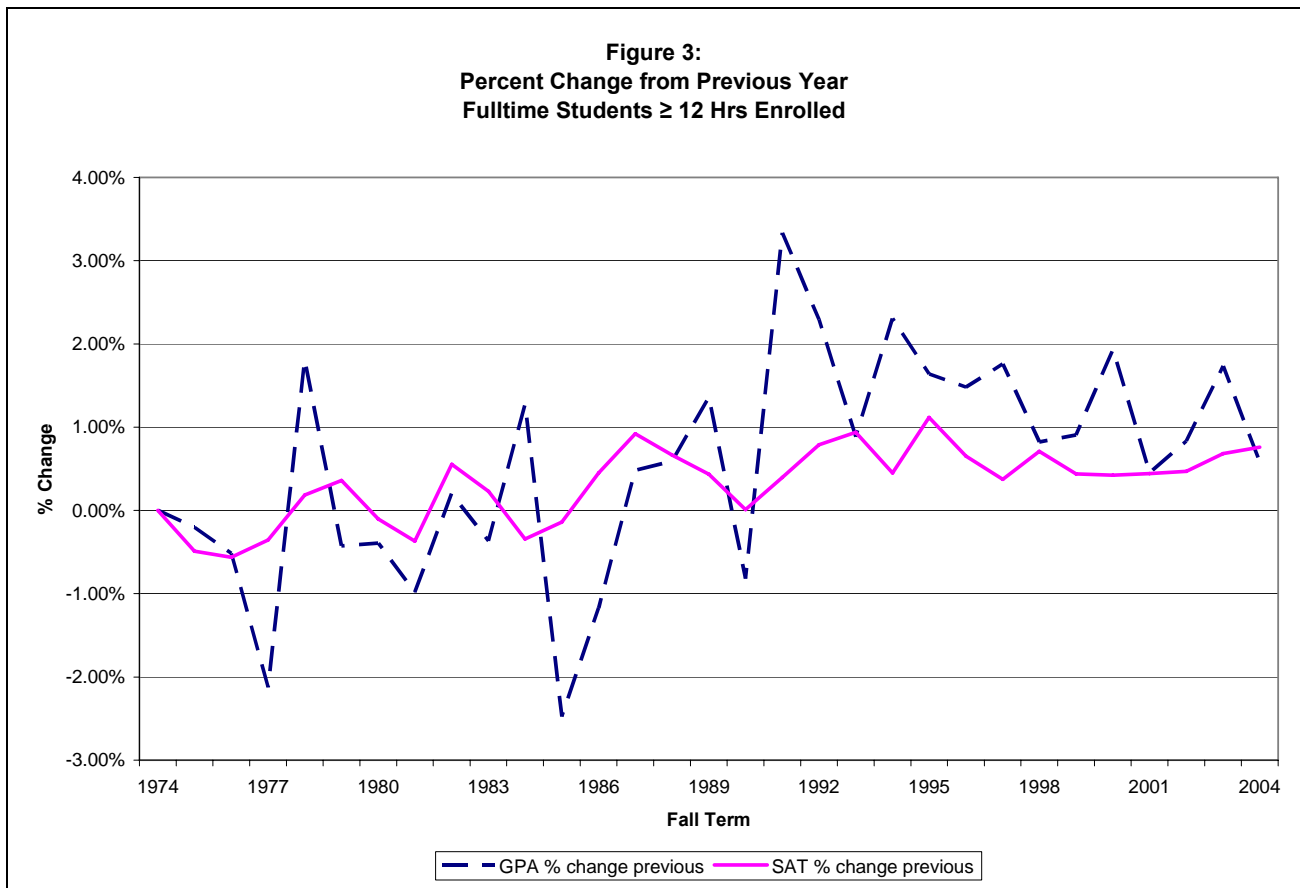
Table 2: SAT Total by Fall Term (All Scores Recentered)

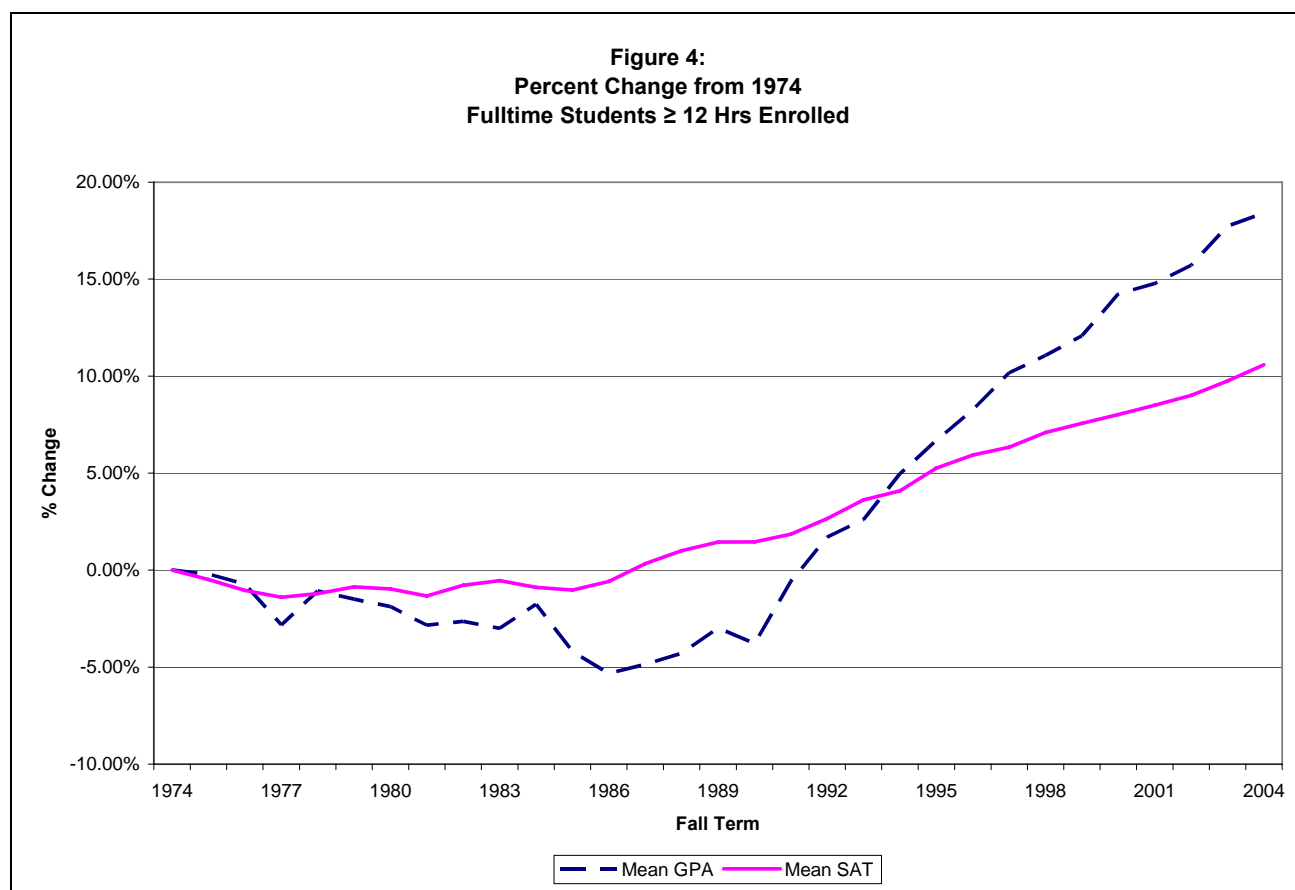
Term	Mean	N	Std. Deviation
1974	1084	8798	139.9
1975	1079	8840	140.2
1976	1073	9045	139.6
1977	1069	10067	139.2
1978	1071	10203	135.9
1979	1075	10655	132.4
1980	1074	10541	133.2
1981	1070	11315	130.6
1982	1076	10764	128.9
1983	1078	10230	129.6
1984	1074	10078	128.9
1985	1073	10155	129.5
1986	1078	10234	130.2
1987	1088	10436	130.1
1988	1095	11325	130.6
1989	1100	11921	130.8
1990	1100	13549	131.9
1991	1104	14630	130.0
1992	1113	14167	130.7
1993	1123	13601	132.7
1994	1128	14255	132.1
1995	1141	14653	132.3
1996	1149	14341	132.4
1997	1153	15132	132.0
1998	1161	15334	132.1
1999	1166	15694	131.7
2000	1171	16192	131.3
2001	1176	17222	128.8
2002	1182	17733	128.5
2003	1190	18091	128.2
2004	1199	18184	129.4

As shown in the charts and tables above, both term GPA and SAT scores for UGA undergraduates increased over time. The paired samples correlation between term GPA and SAT is .331 ($p < .001$) indicating a significant (but not highly positive) relationship between the increase in term GPA and SAT total score from 1974 through 2004.

In addition to examining the average scores over time, it is important to also compare the relationship between the variances as well. While average SATs and GPAs have risen over time, the standard deviation (an indication of the variance among scores) has decreased (see Tables 1 and 2).

An additional way to investigate the change in scores over time is to examine the percent change. Figures 3 and 4 examine the percent change of SAT and GPA from the previous year (Figure 3) and the change since 1974 (Figure 4). Figure 3 shows yearly variations, especially in GPA. Figure 4 shows the percent change in SAT and GPA from 1974 through about 1986 was relatively small, followed by a dip in GPA. An increase in both SAT and GPA began late 1980s/early 1990s through 2004. These graphic representations of the percent change do not reveal definitive answers yet enable one to see differential changes in SAT and GPA over time.





Exploratory analyses also examined differences in SAT and term GPA by gender. With gender coded as 1=male, 0=female, analyses revealed significant differences in GPA and SAT by gender. For 1974 through 2004, men earned significantly higher SAT total scores while women earned higher term GPAs. As an average over time, females comprise approximately 55% of the study's population.

Table 3: Term GPA by Gender

	Ave Term GPA	Std Deviation
Men	2.76	.847
Women	2.96	.829

Table 4: SAT Total by Gender

	SAT Total (R)	Std Deviation
Men	1136	143.35
Women	1111	113.80

Regression Analysis

Following exploratory analyses, a multiple linear regression model was developed to determine the effect each independent variable has on term GPA, the dependent variable. Due to missing data in prior years, the model was built using data from 1994-2004. The intent was to create a predictive GPA for each cohort based on all student demographic and academic attributes present during the entire 11 year period. Table 5 shows the regression output.

Table 5: Regression Model 1994-2004

R	0.469
R-square	0.220
Constant	0.243* (.018)
Gender	0.115* (.004)
White/Non-White	0.129* (.005)
SAT	0.001* (.000)
HS GPA	0.401* (.004)
Transfer status	0.080* (.010)
Receipt of Hope	0.241* (.004)
Colleges/Schools	
Journalism & Mass Communication	0.262* (.010)
Agricultural & Environmental Sciences	-0.142* (.009)
Education	0.099* (.006)
Family & Consumer Sciences	0.032* (.009)
Forest Resources	-0.061* (.017)
Social Work	0.531* (.021)
Environment & Design	0.186* (.014)
A&S Biological Sciences	-0.062* (.007)
A&S Fine Arts	0.094* (.008)
A&S Language & Literature	0.004 (.009)
A&S Physical Sciences	-0.254* (.011)
A&S Social Sciences	0.010 (.006)
A&S other	-0.131* (.005)
SPIA	0.014 (.015)

*p<.01

note: standard errors are shown in parentheses

The college of Business was omitted and used as control group

Table 6 shows the mean predictive GPA for each year created by using the regression model 1994-2004 and the means for each independent variable. The mean actual term GPA earned by students is also included.

Table 6: Predicted GPA by 1994-2004 regression model

Term	actual term GPA	GPA predicted for 94-04 model
1994	2.878	2.886
1995	2.925	2.955
1996	2.969	3.009
1997	3.021	3.041
1998	3.046	3.083
1999	3.073	3.102
2000	3.133	3.125
2001	3.147	3.140
2002	3.173	3.167
2003	3.228	3.197
2004	3.247	3.215

As shown in Table 6, predicted term GPAs are slightly higher than actual values in early years (1994-1999) but slightly lower in more recent fall terms (2000-2004). Thus, the regression model overpredicts term GPA in the early years but underpredicts term GPA in the more recent terms (most terms 1989 – 2004). Results indicate that holding constant for the variables (SAT, gender, race, high school GPA, college of major, transfer status and receipt of HOPE) grades are slightly increasing more than we can predict with these variables.

Summary and 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 Figures 1 and 4, 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 the literature (Kuh & Hu, 1999) 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 slightly lower than predicted in the earlier years (1994-1999) but slightly 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 look for 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.** Please see Appendix A for all unstandardized B coefficients.

The analyses provided in this report don't allow us to pinpoint the exact source, but they do provide some insights into factors that may affect changes in grades for undergraduate students at UGA. For example, our findings parallels those of other researchers who report males earning higher SAT scores and female undergraduates earning higher grades. Similarly, the shifts in demand or policy changes affecting enrollment for certain majors may also influence the GPA.

Coefficients also show that the relative contribution of HOPE scholarship increases in value from 1994-2004. The combination of shifts in gender composition, 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 suggests 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 regression analyses account for only about 22 % of the variance, indicating other factors are influencing grades. Table 7 (at the end of the report) includes a list of possible factors, many of which are complex and not easy to quantify.

The 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 11-year period. **These two findings taken together lead us to the conclusion that the influence of SAT, high school GPA, gender, race, and college of major are important yet only a part of the full answer.**

Kuh, G., & Hu, S. (1999). Unraveling the complexity in the increase in college grades from the mid-1980s to the mid 1990s. *Educational Evaluation and Policy Analysis*, 21, 297-320.

Table 7: List of possible contributing factors

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 others
 - 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 lose scholarships
 - HOPE
 - Does receipt of HOPE influence student's course choices?
 - Do students with HOPE try to persuade faculty for higher grades?
 - Do students work harder for grades due to HOPE?
- 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?

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 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
 - % 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?

Appendix A:
Regression Models Unstandardized Beta Coefficients

Year	R	R-square	Constant	Gender	White/Non-White	SAT	Journalism	Agricul	Education	Family	Forest	Social
Whole Model (94-04)	0.469	0.220	0.243	0.115	0.129	0.001	0.262	-0.142	0.099	0.032	-0.061	0.531
1994	0.435	0.189	-0.014	0.080	0.222	0.001	0.337	-0.106	0.125	0.074	-0.010	0.663
1995	0.453	0.205	0.193	0.075	0.223	0.001	0.303	-0.061	0.178	0.176	0.007	0.589
1996	0.440	0.194	0.310	0.111	0.191	0.001	0.327	-0.068	0.157	0.058	-0.005	0.516
1997	0.439	0.193	0.214	0.096	0.085	0.001	0.280	-0.039	0.166	0.145	0.002	0.585
1998	0.457	0.209	0.404	0.092	0.088	0.001	0.268	-0.131	0.065	0.104	0.009	0.774
1999	0.476	0.226	0.386	0.143	0.109	0.001	0.169	-0.254	0.133	0.021	-0.084	0.569
2000	0.465	0.216	0.502	0.098	0.127	0.001	0.217	-0.200	0.116	0.022	-0.086	0.474
2001	0.457	0.209	0.444	0.147	0.080	0.001	0.266	-0.200	0.105	-0.020	-0.186	0.441
2002	0.463	0.214	0.338	0.158	0.118	0.001	0.185	-0.190	0.028	-0.038	-0.134	0.422
2003	0.468	0.219	0.226	0.123	0.106	0.001	0.179	-0.207	0.028	-0.112	-0.163	0.291
2004	0.455	0.207	0.357	0.146	0.112	0.001	0.174	-0.244	-0.039	-0.121	-0.198	0.482

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 (94-04)	0.186	-0.062	0.094	0.004	-0.254	0.010	-0.131	0.014	0.401	0.080	0.241
1994	0.121	-0.066	0.106	0.013	-0.303	0.019	-0.126		0.447	0.131	0.086
1995	0.193	0.009	0.081	0.034	-0.241	0.079	-0.115		0.432	0.107	0.198
1996	0.199	0.026	0.145	0.077	-0.170	0.044	-0.110		0.312	0.010	0.241
1997	0.375	0.010	0.161	0.072	-0.193	0.074	-0.102		0.364	0.125	0.210
1998	0.193	-0.085	0.117	0.038	-0.291	-0.001	-0.146		0.395	0.104	0.260
1999	0.113	-0.211	0.030	-0.124	-0.321	-0.052	-0.244		0.404	0.059	0.279
2000	0.097	-0.081	0.013	-0.140	-0.356	-0.026	-0.206		0.378	0.029	0.301
2001	0.238	-0.098	0.036	0.021	-0.217	-0.003	-0.180		0.373	0.060	0.286
2002	0.114	-0.094	0.087	-0.041	-0.205	-0.062	-0.160	0.028	0.374	0.115	0.273
2003	0.162	-0.132	0.088	-0.037	-0.207	-0.043	-0.108	-0.011	0.413	0.048	0.260
2004	0.102	-0.112	0.005	-0.050	-0.243	-0.092	-0.153	-0.016	0.393	0.042	0.251