*Assessment & Evaluation in Higher Education*
*Vol. 30, No. 6, December 2005, pp. 561–569*

# Nominal GPA and Real GPA: a simple adjustment that compensates for grade inflation

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Grade inflation is a long-standing problem whose seriousness is demonstrated by a wide variety of studies of grade distributions. A few institutions have changed the information on their transcripts in an effort to account for it. Proposals to index grades have been largely unsuccessful for a variety of reasons. A simple index, the Real GPA, is calculated as a ratio of the individual student's instructor-assigned GPA to the average GPA of the class and expressed numerically on the same scale as the inflated assigned grade. Recorded on transcripts next to the Nominal GPA, the Real GPA makes the relative degree of inflation in a transcript immediately visible and creates positive pressures on academic standards.

## Introduction

Grade inflation is widely recognized as a problem in higher education in the United States. A web site maintained by Stuart Rojstaczer of Duke University (gradeinflation.com) tracks grades given at about 30 universities since 1967 and confirms the general impression of most academics that standards have changed. Rojstaczer's data indicate that the average grades given at the schools he profiles have increased 0.6 on the traditional 4 point scale since 1967, with 'private schools undergoing grade inflation at a rate that is about 25–30% higher than public schools'. Studies at individual institutions consistently confirm the trend. At Duke itself, the average grade was 2.7 in 1961 and 3.3 in 1994 (Bliwise, 1997). Comparable inflation took place at the University of Washington, from 2.31 in 1964 to 3.12 in 1996, and at the University of Chicago, from 2.5 in 1965 to 3.26 in 1999 (University of Miami, 2001). A Google search using keywords associated with grade inflation and indexing locates articles in mainstream journalism, *The chronicle of higher education*, alumni magazines, campus

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ISSN 0260-2938 (print)/ISSN 1469-297X (online)/05/060561–09

DOI: 10.1080/02602930500260571

newspapers and minutes of faculty senate web sites. These indicate that grade inflation and what to do about it are topics at universities and colleges all over the county. Valen Johnson's *Grade inflation: a crisis in education* (2003) is the definitive analysis of these discussions and the research upon which they draw.

Philosophical questions about the legitimacy of grading in principle are one issue. Grades are inherently ambiguous evaluations of performance with no absolute connection to educational achievement. It is clear that wide variations in the grades given by different instructors in the different sections of the same course, different instructors in the same departments, differences in the difficulty of subject matter in different areas and differences in the ability of students in different areas seriously undermine the GPA as a reliable measure of education (Johnson, 1997). Some argue that they therefore have no useful connection to educational achievement at all, measuring rather how well students have accommodated the biases of a dominant group or individual. In such views, the hierarchies grades create are artifacts of class background or tangential skills like test-taking ability. The fundamental limitations of grades have led many to challenge them; some would abolish them and most professors dislike the function of evaluation that grades represent.

Our concern with grade inflation acknowledges this but seeks to deal with grade inflation for two reasons: one is the reason that grades arose in the first place. We, like most, believe there is a difference between knowing something and not knowing it. The difference is often important and grades arose as a means of assessing the difference for interested constituencies. As long as the political demands on the educational establishment require some assessment of educational performance, the focus of the effort should be on grades since other forms of assessment are subject to the same limitations and political pressures that generate inflated grades. Other forms of assessment will be no less corrupt than grades and would be redundant if relatively meaningful grading standards were in effect.

Our second concern is simple practicality. The complexity and scope of American educational institutions are enormous. The inertias in such institutions are also enormous. Large-scale systematic change is not in the offing; grades are not going to be abandoned. We believe that, within the realm of the possible, the simple indexing scheme that we propose, while not fundamentally altering any of the limitations of the traditional grading system (for instance its arbitrary declaration that 'C' is average work irrespective of the quality of the content or the student cohort in a given course) will nevertheless create indirect but salutary pressures on students to avoid courses that inflate grades and on faculty not to inflate grades. The long-term effects of these pressures would be positive in real educational terms. We argue that a comparatively superficial change would, over the long term, bring about some fundamental change. The simplicity of the index relative to the change it will generate is the basis of its attractiveness.

Discussions of grade inflation that accept grades in principle focus on the diminished utility of the Grade Point Average (GPA) and how to deal with it. Any effort to do so encounters formidable entrenched interests. Some of the benefits associated with high grades accrue to students regardless of the integrity of the grade. That typical

grades are inflated therefore invites many students to avoid rigorous courses with uninflated grades because such courses lower GPAs. Johnson (2003), for example, demonstrates the dramatic differences between the grades given in the humanities and the hard sciences and argues that the relative ease of getting high grades in humanities courses accounts for the large enrollments in those courses. At the University of Wisconsin-Madison in Fall 1998, the cumulative GPA in the Department of Curriculum and Instruction was 3.90; in Mathematics it was 2.64 (Beck, 1999). Easy courses with high grades are attractive to students whose educational aspirations are either immature or not serious.

At the same time, clear material benefits are available to faculty who give high grades. They receive higher course evaluations and the resulting professional benefits. That high grades are correlated to high Student Opinion Survey (SOS) scores has been demonstrated by a number of studies (McKenzie, 1975; Carney *et al.*, 1978; Nelson & Lynch, 1984; Zangenehzadeh, 1988; Greenwald & Gilmore, 1997; Felton *et al.*, 2004; and, most thoroughly, by Johnson, 2003). Inflated grades also assist some faculty because students with high grades do not take up time in tedious, often time-consuming complaints. Temporary faculty whose teaching performance is typically reviewed annually are under especially intense pressure to keep their students pacified with relatively high grades. The pressure to inflate grades even becomes institutional to the extent that rigorous grading standards at one school relative to schools with comparable status and aspirations place its graduates with lower GPAs at a comparative disadvantage (Chan *et al.*, 2002).

## Approaches to the problem

There have been a number of efforts by scholars and institutions to deal with grade inflation. In 1994, Dartmouth College began including on transcripts, along with a student's grade in a class, the median grade for all students in the class and the total enrollment. Even so, the average GPA at Dartmouth increased from 3.25 in 1994 to 3.33 in 2000–2001 (Gardner, 2002). In 1998, Indiana University in Bloomington, after years of sustained discussion, introduced the Expanded Grade Context Record (EGCR). Along with a record of courses, professors and grades, an IU student's EGCR provides a wide range of additional information about the levels of performance of the student relative to others in the class and about the majors and overall performances of other students in the class. One item in the EGCR is the class GPA, computed as the average of the GPAs of all the students in the class. Another is an index computed as the number of students in the course receiving the same or higher grades divided by the total number of grades given in the course (McConahay & Cote, 1998).

The University of Miami's efforts involved extensive committee work. The gathering of institutional data confirmed a problem with grade inflation and led to a series of recommendations about how information such as the grade distributions of individual instructors, departments, and other divisions should be discussed within the university. The committee report concluded with a recommendation that the

university create an *ad hoc* committee to study the possibility of grade indexing (Miami, 2001).

Duke University's discussion of the Achievement Index (AI) proposed by statistics professor Valen Johnson arose out of the work of an *ad hoc* committee formed in 1995 to study grade inflation (Bliwise, 1997). The AI calculates a ratio based on a student's grade in a class, the student's relative position in the class and the relative difficulty of the class as indicated by the grade distribution in the class (Johnson, 1997). A scatter point comparison of individual AIs and GPAs indicated that the AI did indeed differentiate between students who had high GPAs in relatively easy courses and those whose GPAs were based on more rigorous course work. A controversial proposal to use the AI at Duke was rejected in March 1997 by a 19–14 vote of the Arts and Sciences Council. Science and math professors voted mostly in favor of the proposal and most humanities professors voted against it.

A simple and immediately intelligible grade index would be a useful addition to the debates about grade inflation. Many schools are discussing the possibility of indexing; several leading institutions have undertaken versions of indexing; any school willing to approach the issue would be helped by having a part of the work already done in a useful way. The EGCR at Indiana–Bloomington and the AI at Duke are complex measures. Dartmouth's reporting of the median grade in a class is only part of the information necessary to judge the quality of a performance. Nagle's Relative Performance Index, calculated as the ratio of the student's GPA and the cumulative GPA of the class has a similar limitation (Nagle, 1998). Georgakopoulos' design of a Relative Rank which is calculated in terms of a student's grade, the median grade in a class and the dispersion of grades in a class, includes what we believe to be the relevant information, but he proposes to replace the traditional grade on a transcript with the calculation of Relative Rank. This strikes us as a political impossibility.

We propose an alternative index that extends a proposal made by Grieves (1982), who suggested that transcripts should replace the traditional letter grade with a two number grade. The first number would be the grade point earned in the course. The second would be the average GPA given in the class for the semester, course, and section in question. Grieves's proposal is tied to class averages, but it distinguishes the relative performance of good and bad students from those of their peers. It does not deal with grade dispersion, but it does publicize in a fairly public way those courses that have very high average grades. Thus it creates some pressure on instructors whose grades are *prima facie* inflated.

## Nominal and Real GPAs

We too would list two grades on each transcript. We take Grieves' method for adjusting grades a step further by calculating what we call the Real GPA for each student and using that Real GPA as the second item on the transcript, appearing next to the traditional, instructor assigned grade, which we will call the Nominal GPA.

The only additional information needed for the calculation of the Real GPA is the class GPA. Our method is simple in comparison to Johnson's (1997) proposal at

Duke or to methodically comparable proposals which introduce new terms to the transcript (such as the *Z* score in Ho & Shalishali, 2001). Also, we are not proposing that the traditional Nominal GPA should be eliminated.

Consider the student in Table 1. Using a scale where an 'A' is 4.00, an 'A–' is 3.70, a 'B+' is 3.30, a 'B' is 3.00, a 'B–' is 2.70, down to a 'D–' that counts for 0.70 points, his GPA for the semester is 3.56. This Nominal GPA is computed in the usual manner by taking the course GPAs weighted by credit hours per course, as follows:

$$\textit{Nominal GPA} = [3.70(3) + 3.30(3) + 3.00(3) + 4.00(3) + 3.00(1) + 4.00(3)] \,/\, 16 = 3.56$$

The student's Real GPA is calculated by adjusting the Nominal GPA per class by the class GPA, as follows:

$$\text{Real GPA} = \left\{\left[\frac{3.70(3)}{2.15} + \frac{3.30(3)}{1.95} + \frac{3.00(3)}{2.75} + \frac{4.00(3)}{3.26} + \frac{3.00(1)}{3.17} + \frac{4.00(3)}{2.98}\right] / 16\right\} \times 2.00 = 2.77$$

The Real GPA adjusts the Nominal GPA to a scale where 2.00, a 'C', is average. A student with a Real GPA that is above 2.00 has outperformed the class on average, while a student with a Real GPA below 2.00 has underperformed the class on average.

The usefulness of Real GPAs in comparison to Nominal GPAs is illustrated in an example that is contained in Tables 2 and 3. Suppose that Student A and Student B are competing for a scholarship at the end of their sophomore year in college. The two students took the same courses. However, they had different professors for all of their classes but two. They took SNP 280 and SOC 200 together and they both made 'A's' for the two classes. Student A's Nominal GPA is 3.66 while Student B's Nominal GPA is higher at 3.80. Based on unadjusted GPAs, a selection committee would probably select Student B for the scholarship based on seemingly compelling data. They took exactly the same classes and Student B has a higher GPA. But

Table 1. Real and Nominal GPAs

| Course | Letter grade | Credit hours | Class GPA | Nominal GPA | Real GPA |
|---|---|---|---|---|---|
| ENG 101 | A– | 3 | 2.15 | 3.70 | 3.44 |
| MTH 216 | B+ | 3 | 1.95 | 3.30 | 3.38 |
| GEO 118 | B | 3 | 2.75 | 3.00 | 2.18 |
| FRN 125 | A | 3 | 3.26 | 4.00 | 2.45 |
| PED 180 | B | 1 | 3.17 | 3.00 | 1.89 |
| ACC 100 | A | 3 | 2.98 | 4.00 | 2.68 |
| Total credit hours, weighted-average GPAs | | 16 | 2.65 | 3.56 | 2.77 |

Student B is the wrong choice. He actively seeks easy professors using web sites such as Pick-A-Prof.com and RateMyProfessor.com (These sites, weak as they are, are indeed used to these purposes by weak students), and his Real GPA is only 2.40. His Nominal GPA of 3.80 is misleading because he barely outperforms the class on average. Conversely, Student A takes professors who are more challenging and his Real GPA is much higher at 2.76.

Placing a simply calculated Real GPA alongside a Nominal GPA is statistically less sophisticated than some other proposed indices. We think that the simplicity is an essential component of its utility, as is the continued recording of the traditional grade. It does not burden administrators. It is easy to explain and to read. It allows professors to record their judgment of a student's performance in the traditional manner. But the juxtaposition of the Real and Nominal GPA creates a concrete measure of the degree of inflation in a student's transcript by expressing the ratio of student average and class average on the same numerical scale as the Nominal GPA. This carries political power of several sorts. Even inflated Nominal GPAs on transcripts can be usefully evaluated by skilled readers who know how to recognize weak

Table 2. Transcript for hypothetical student A

| Course | Letter grade | Credit hours | Class GPA | Nominal GPA | Real GPA |
|---|---|---|---|---|---|
| ENG 101 | B+ | 3 | 2.46 | 3.30 | 2.68 |
| GEO 120 | A– | 3 | 2.85 | 3.70 | 2.60 |
| HST 102 | B | 3 | 2.20 | 3.00 | 2.73 |
| MTH 105 | A | 5 | 1.90 | 4.00 | 4.21 |
| PSY 100 | B+ | 3 | 3.05 | 3.30 | 2.16 |
| SCI 197 | B– | 1 | 2.95 | 2.70 | 1.83 |
| AST 180 | A | 3 | 2.74 | 4.00 | 2.92 |
| CPS 100 | A | 3 | 2.90 | 4.00 | 2.76 |
| HST 145 | B+ | 3 | 2.59 | 3.30 | 2.55 |
| MTH 110 | A | 5 | 2.36 | 4.00 | 3.39 |
| SCI 214 | A– | 3 | 3.64 | 3.70 | 2.03 |
| ACC 201 | A | 3 | 2.21 | 4.00 | 3.62 |
| BIS 221 | A | 3 | 3.68 | 4.00 | 2.17 |
| BLR 202 | B+ | 3 | 2.75 | 3.30 | 2.40 |
| ECO 201 | B | 3 | 2.79 | 3.00 | 2.15 |
| ENG 201 | A– | 3 | 2.58 | 3.70 | 2.87 |
| SPN 280 | A | 3 | 3.66 | 4.00 | 2.19 |
| ACC 202 | A– | 3 | 2.16 | 3.70 | 3.43 |
| ECO 202 | B+ | 3 | 2.79 | 3.30 | 2.37 |
| ENG 202 | A | 3 | 2.89 | 4.00 | 2.77 |
| HST 280 | B | 3 | 2.90 | 3.00 | 2.07 |
| SOC 200 | A | 3 | 3.74 | 4.00 | 2.14 |
| STA 282 | A | 3 | 2.35 | 4.00 | 3.40 |
| Total credit hours, weighted-average GPAs | | 71 | 2.75 | 3.66 | 2.76 |

Table 3. Transcript for hypothetical student B

| Course | Letter grade | Credit hours | Class GPA | Nominal GPA | Real GPA |
|---|---|---|---|---|---|
| ENG 101 | A | 3 | 3.39 | 4.00 | 2.36 |
| GEO 120 | A– | 3 | 3.15 | 3.70 | 2.35 |
| HST 102 | B+ | 3 | 3.15 | 3.30 | 2.10 |
| MTH 105 | A– | 5 | 2.85 | 3.70 | 2.60 |
| PSY 100 | B+ | 3 | 3.15 | 3.30 | 2.10 |
| SCI 197 | A | 1 | 3.64 | 4.00 | 2.20 |
| AST 180 | A | 3 | 3.24 | 4.00 | 2.47 |
| CPS 100 | A | 3 | 3.37 | 4.00 | 2.37 |
| HST 145 | A– | 3 | 3.28 | 3.70 | 2.26 |
| MTH 110 | A | 5 | 3.03 | 4.00 | 2.64 |
| SCI 214 | A | 3 | 3.24 | 4.00 | 2.47 |
| ACC 201 | A | 3 | 2.94 | 4.00 | 2.72 |
| BIS 221 | A | 3 | 3.88 | 4.00 | 2.06 |
| BLR 202 | A– | 3 | 3.55 | 3.70 | 2.08 |
| ECO 201 | A | 3 | 2.94 | 4.00 | 2.72 |
| ENG 201 | A– | 3 | 2.89 | 3.70 | 2.56 |
| SPN 280 | A | 3 | 3.66 | 4.00 | 2.19 |
| ACC 202 | A– | 3 | 2.73 | 3.70 | 2.71 |
| ECO 202 | B+ | 3 | 2.84 | 3.30 | 2.32 |
| ENG 202 | A | 3 | 2.99 | 4.00 | 2.68 |
| HST 280 | B+ | 3 | 3.42 | 3.30 | 1.93 |
| SOC 200 | A | 3 | 3.74 | 4.00 | 2.14 |
| STA 282 | A | 3 | 2.83 | 4.00 | 2.83 |
| Total credit hours, weighted-average GPAs | | 71 | 3.19 | 3.80 | 2.40 |

courses and the typical patterns of grade inflation. With a Real GPA posted on the transcript, the same judgement could be made quickly by non-specialists.

We expect that Real GPAs will create several salutary trends among students, who are currently engaging in understandable expressions of self-interest when they take easy courses. In courses where all grades are high, it is impossible for serious and diligent students to differentiate themselves from their less capable colleagues. Real GPAs address the anger of good students whose superior work is invisible in classes where everyone gets an 'A'. A Nominal 'A' in a course where all receive 'A's' is a Real 'C'. The real 'C' does not solve the problem of the rigorous course populated by very good students where nearly everyone gets a high grade, a problem which is not typical, but the visibility of the Real 'C' is an incentive for good students to seek out courses with the sorts of work and evaluation that create dispersed grades. It invites professors to create courses with dispersed grades in order to attract such students. A Nominal 'B' in a course where the average grade is a 'C' means something important about both the student and the instructor of the course involved. The routine publication of such data, in forums ranging from promotion committees to department

meetings to personnel offices in off-campus institutions will create long-term pressure on faculty just as Student Opinion Survey (SOS) scores have, but it will be pressure to reverse the pattern of grade inflation that has accompanied the use of SOS scores. Just as these scores, in themselves ambiguous measures of teaching performance but simple to implement, have had important long-term effects, we believe that a simple, admittedly ambiguous grade index has the capacity to create very positive long-term change.

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## Notes

1. We are adopting the terms Nominal and Real from economics, where the actual Gross Domestic Product (GDP) for a given year is called the Nominal GDP, and Real GDP measures production in constant prices. Comparisons of Nominal GDPs over time are not very meaningful since a rising Nominal GDP may be due to rising economic output, rising prices, or a combination of the two.

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