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Grade Inflation and the Signaling Value of Grades

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Grade Inflation and the Signaling Value of Grades

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Abstract

Grade Inflation and the Signaling Value of Grades

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Grades are the fundamental currency of our educational system; they incentivize student performance and academic behavior, and signal quality of student academic achievement to parents, employers, postsecondary gatekeepers, and students themselves. Grade inflation compromises the value of grades and undermines their capacity to achieve the functions for which they are intended. I challenge the 'increases in grade point average' definition of grade inflation employed by critics and argue that grade inflation must be understood in terms of the *signaling power* of grades. Analyzing data from four nationally representative samples of high school students, I find that in the decades following 1972: (a) grades have risen at high schools and dropped at four-year colleges, in general, and selective four-year institutions, in particular; and (b) the signaling power of grades has attenuated little, if at all. I conclude that the concerns of critics who warn of rampant grade inflation are misplaced. Grades at secondary and postsecondary institutions are just as meaningful now as they were four decades ago.

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Since at least 1894 when a committee at Harvard University warned that "[g]rades A and B are sometimes given too readily--Grade A for work of no very high merit, and Grade B for work not far above mediocrity…" educational researchers have warned about grade inflation (Report of the Committee on Raising the Standard, Harvard University 1894; as cited in Kohn 2008). Critics continue to express concerns about "[a] reduction in the capacity of grades to provide true and useful information about students" (Kamber 2008) due to an enduring mismatch between student achievement and the grades students receive (Rojstaczer and Healy 2012). Despite these enduring concerns we know little about changes in the relationship between achievement and grades over time and their impact on the capacity of grades to serve as a signal of student quality.

I challenge the often implicit definition of grade inflation employed by critics, suggesting that the 'increases in grade point average' definition is inadequate for understanding grade inflation. Instead, I argue that the *signaling power* of grades is a necessary component of the grade inflation story. To better understand the grade inflation problem, I address two key research questions:

1. Have mean secondary and postsecondary grades risen in the decades following 1972?
2. Has the signaling power of grades declined over this time period?

I move beyond an analysis of change or stability in the mean to consider change or stability in the variance of grades, and the covariance of grades with antecedents (student ability and effort) and outputs (educational attainment, earnings, and occupational prestige). In addition to considering general trends in grade inflation at high schools and

four-year colleges I investigate grade inflation among selective universities. My analysis of transcript and survey data from four nationally representative samples of youth who were expected to complete high school in 1972, 1982, 1992, and 2004 leads me to conclude that concerns about grade inflation are overstated if not entirely misplaced.

BACKGROUND

Grade Inflation

Empirical studies demonstrate that grades are positively associated with student effort (Kelly 2008), educational plans (Rosenbaum 1980), persistence to degree (Attewell, Heil, and Reisel 2010; Bowen, Chingos, and McPheron 2009), occupational prestige (Baird 1985), and long-term earnings (Bills 2003; Filer 1981; Gemus 2010; Jones and Jackson 1990; Loury 1997; Miller 1998; Rosenbaum 2001; Wise 1975). Despite these enduring findings, some scholars assert that an increase in mean grades has degraded the quality of the signal grades carry over time at both the secondary (ACT 2005; Carr 2004; Pope 2006) and postsecondary levels (Astin 1998; Babcock and Marks 2011). Such critics suggest that A's and B's are easier to come by now than in the past, contributing to a decline in student motivation and effort and degrading signaling value of grades for parents, postsecondary gatekeepers, and employers. Despite such conjectures, there is little empirical evidence to support a change in the signaling power of grades. Without jointly considering the mean and signaling criteria for grade inflation, I argue, past studies risk mistaking increases in student achievement for a loosening of grading standards.

Consistent with other work on the topic, I argue that grade inflation requires an upward shift in mean grades. Absent other changes in the distribution of grades, however, I argue mean shifts do not themselves imply devaluation. The signaling power of grades could be attenuated by a decline in the dispersion (or variance) in grades. Given a ceiling of grades at 4.0, increases in the mean could lead to a decline in the variance, but the relationship between the mean and variance is not deterministic; other shifts in the distribution (changes in the maximum GPA, growth in the lower tail of the distribution, etc.) could also compensate for mean shifts. Moreover, the only reason one should be concerned about changes in the distribution of grades is if those changes are unrelated to the important qualities grades are thought to reflect (student effort and ability) and predict (educational attainment and labor force outcomes). Declines in the association between grades and these important antecedents and products could be proof of the declining signaling power of grades and grounds for concern. Thinking about grade inflation in this way is an important contribution to the grade inflation literature because critics often highlight the central tendency component of grades, while ignoring the variance component, and taking the covariance component as given.

Grade Inflation in High School

Research employing the 'increases in mean grades' definition of grade inflation documents widespread grade inflation at high schools in the United States (ACT 2005; Camara, Kimmel, Scheuneman, and Sawtell 2003; Carr 2004; Godfrey 2011; Pope 2006; Woodruff and Ziomek 2004; Ziomek and Svec 1995). Most recently, Godfrey (2011) used public high school student records from one state, along with corresponding exam

score records from the College Board, to examine shifts in grade point averages relative to shifts in students' scores on the math and verbal sections of the SAT. In 2006 the average cumulative high school GPA was 2.90, up a quarter of a grade point from 1996, despite relatively stable mean SAT scores (Godfrey 2011). Moreover, the American College Testing Program (ACT) (ACT 2005; Woodruff and Ziomek 2004; Ziomek and Svec 1995) and the National Center for Education Statistics (NCES) (Perkins, Kleiner, Roey, and Brown 2004) released school-level studies documenting increases in mean GPA in high schools without a concurrent increase in student achievement, as measured by test scores.

With one exception (Perkins, Kleiner, Roey, and Brown 2004), these studies include only students who have taken either the ACT or SAT. Furthermore, Godfrey (2011) examines high school students who have completed advanced placement coursework. These analytic decisions truncate the sample of high school students and may compress the distribution of grades or lead to inflated estimates of GPA because those who are not college-bound are omitted from the sample and typically have lower GPAs than those who are college-bound. Much of the existing literature on grade inflation in secondary education is hampered by additional data limitations, such as a reliance on student reports of grades, which have been shown to systematically differ from school records (Kuncel, Credé, and Thomas 2005). Lastly, because many of the findings about increases in mean grades are based on school-level data and/or are not based on nationally representative samples, they are not informative about student-level population trends in mean high school grades (see Perkins et al. 2004 for an exception).

Grade inflation in Postsecondary Education

Contrary to consistent findings of grade inflation in secondary education, findings are mixed on both the existence and prevalence of grade inflation at postsecondary institutions. Some scholars contend that grade inflation among postsecondary universities is rampant (Juola 1976; Kamber 2008; Levine and Cureton 1999; Rojstaczer and Healy 2012; Yang and Yip 2003), while others assert that it is nothing more than a "dangerous myth" (Kohn 2008) (Adelman 2008; McAllister, Jiang, and Aghazadeh 2008). Importantly, much of the literature in support of grade inflation hinges upon temporal increases in mean grades, while the literature challenging it questions this definition as *proof* of inflation (Brighouse 2008; Kohn 2008)

Juola (1976), one of the earliest researchers to employ a large database to raise empirically-based concerns about grade inflation in postsecondary education, used data from 134 colleges (28% of his original stratified sample) to illustrate that "grade inflation in higher education is real and conspicuous" (p.7). Juola highlights that mean grades increased four-tenths of a point from 1965 to 1973, findings corroborated and extended by more recent studies (Kuh and Hu 1999; Levine and Cureton 1999; Rojstaczer and Healy 2012; Yang and Yip 2003). For example, Kuh and Hu (1999) used student reports of grades to illustrate that college grades increased at every level of institutional selectivity between the mid-1980s and mid-1990s. Similar research documents particularly steep increases in grade point average at selective colleges (relative to less selective universities) over time (Babcock and Marks 2011; Cote and Allahar 2007; Johnson 2003; Rojstaczer and Healy 2012; Wilson 1999). For example, the median GPA

at Princeton in 1997 was 3.42, an increase of approximately 11 percent since 1973 (Wilson 1999). Meanwhile, the SAT scores of students enrolled at slective colleges remained stable over this time period (Rojstaczer and Healy 2012).

Despite numerous studies that find grade inflation at postsecondary institutions, Adelman (2008) found no single-direction, nation-wide trend in grades between 1972 and 1992, highlighting the importance of utilizing representative, transcript-based data. Importantly, many of the studies finding support for grade inflation are not nationally representative and/or are plagued by low response rates, making it difficult to discern whose grades are being captured. Furthermore, studies that rely on student-reports of college grades may not be accurate given that only half of college students correctly report their grades and a third over-report (Kuncel, Credé, and Thomas 2005). In the present study, I address these limitations and examine the important nexus between shifts in mean grades and the ability of grades to signal student effort, ability and productivity. Together, these contributions allow me to develop a more complete understanding of the existence and magnitude of grade inflation.

DATA AND METHODS

Data and Samples

I base my analyses on survey and transcript data from four nationally representative samples of high school students: The National Longitudinal Study of the High School Class of 1972 (NLS72), the High School and Beyond sophomore cohort (HS&B), The National Educational Longitudinal Study of 1988 (NELS), and The Educational Longitudinal Study of 2002 (ELS). These data are well suited for this

analysis for several reasons: they are nationally representative, include high school (1982, 1992 and 2004) and college (1972, 1982, and 1992) transcript data, and include measures of antecedents and outcomes of grades.

I restrict my high school analytic sample to respondents with a transcript-based indicator of high school graduation or GED within two years of their expected graduation date. I restrict my college analytic sample to respondents with a transcript-based indicator of four-year or selective (defined below) four-year college attendance within two years of their expected graduation date from high school.[1] Dividing my college sample into two strata allows me to gauge if grade inflation is particularly problematic at selective universities. All respondents have complete high school and college transcript data after consideration of these restrictions. I use listwise deletion for missing data on the independent variables (high school antecedents). I retain 86%, 90%, and 91% of my original analytic sample for the HS&B, NELS, and ELS cohorts, respectively.[2] I obtain similar results for the full sample when I utilize constant substitution to impute data for respondents with missing values. Below I discuss the variables and analytic plan employed to answer my research questions.

Variables

Grade Point Average. I construct *weighted high school GPA* by weighting core academic course grades (reading, math, science, and social studies) by the number of

[1] The 1972 cohort includes postsecondary but not secondary transcripts. For this reason, NLS72 respondents are omitted from analyses that include high school GPA as an outcome or predictor. The 2002 cohort includes secondary but not postsecondary transcripts. For this reason, ELS respondents are omitted from analyses that include college GPA as an outcome or predictor.

[2] We do not impute data for the 1972 cohort because NLS72 respondents are omitted from analyses that include high school antecedents.

credits students earned in each course.[3] Similarly, I construct *weighted four-year college GPA* by weighting course grades by the number of credits students earned in each course.[4]

High School Antecedents. The key antecedents I examine are achievement test scores and student reports of student effort. My *achievement* measures are standardized 10th grade mathematics achievement and reading comprehension scores based on multiple choice tests administered to the 1982, 1992, and 2004 cohorts by NCES. I observe similar patterns when I employ SAT scores (or estimated SAT scores for students taking only the ACT) instead of the test scores included as part of the panel studies. I construct *student effort* using student's 10th-grade responses to three questions: "How often do you come to class and find yourself without these things? a) pencil or paper (when needed); b) books (when needed); and c) your homework done (when assigned)." Response categories include: "usually," "often," "seldom," and "never." Question wording and response categories are consistent across the 1982, 1992, and 2004 cohorts. [5]

[3] I obtain similar results when I add a grade point to grades in honors, advanced placement (AP), and international baccalaureate (IB) courses.

[4] I first convert all grades, whether letter or numerical, to a four-point scale, omitting grades indicating in-process status, audits, no-penalty withdrawals, no-grade pass, etc. Next, I standardize all non-transfer-term credits on a semester metric and create a flag to indicate all courses for which credit was earned.

[5] I reverse code ELS response categories to ensure that valence is uniform across cohorts. Alpha values are 0.72 for HS&B, 0.70 for NELS, and 0.80 for ELS. While it would have been informative to also examine teacher-reports of student effort, this is not feasible because the questions asked of teachers for the 1982 cohort differ dramatically from those asked of teachers for the 1992 and 2004 cohorts. Preliminary analyses of the teachers in the 1992 and 2002 cohorts show similar associations between student and teacher-reports of student effort and high school grades.

Postsecondary Outcomes. The key postsecondary outcomes I examine are *four-year college attendance* (within two years of expected high school graduation),[6] *selective college attendance* (conditional on four-year college attendance), and *baccalaureate degree completion* within five years of expected high school graduation date (conditional on four-year college attendance). [7] This restriction captures the majority of college completers in my analytic samples. For example, of the students who graduated high school in 2002, 56 percent completed college within five years despite the fact that the median time to degree has increased in the decades following 1972. I consider colleges to be selective if they are ranked by Barron's Admissions Competitiveness Index as 'highly competitive' or 'most competitive' in the years corresponding to each dataset (Schmitt 2009).

Occupational Outcomes. The key occupational outcomes I examine are occupational prestige and logged annual earnings. Occupational prestige is a measure of the stature a particular occupation holds in society and is often used to gauge relative social class positions. I define *occupational prestige* using the 1989 Nakao-Treas Occupational Prestige Scores, which are based on 1980 Census three-digit occupational codes (Nakao and Treas 1994).[8] For the 1972 cohort, I link the 1970 Census occupational

[6] Because initial attendance information is only available for a small subset of the NLS72 cohort, I construct the college attendance measure for this cohort using a 1986 transcript-based report of the Carnegie Classification Code corresponding to the last institution a particular student attended. To better ensure the comparability of this measure across the datasets, I omit students who are not eligible to attend a four-year college by 1974 (two years after their expected graduation date from high school). Similarly, respondents who do not report attending a four-year college by 1974 are categorized as not attending a four-year college.

[7] I observe similar patterns when I did not impose this restriction.

[8] Nakao and Treas (1994) construct occupational prestige for the 503 detailed occupational categories of the 1980 census classification system using the 740 occupational titles that were evaluated in the 1989

codes to the 1980 Census codes. This allows me to assign a Nakao-Treas Occupational Prestige Score to each occupation in the sample. Because three-digit Census codes are not available for the 1982 and 1992 cohorts, I construct a measure for each cohort, capturing the average occupational prestige for the exemplar occupations in the 1980 census categories listed on the survey instrument for each dataset. [9] I define *earnings* as the log of respondent's annual earnings (conditional on reporting an occupation). To retain the income of respondents who reported no earnings, I add $250 to each respondent's reported annual income.

Analytic Approach

My methods are straightforward. To answer my first research question, I present the mean high school and college GPA for each cohort overall and by college selectivity. To answer my second research question, I separately examine two components of secondary and postsecondary grades: variance and covariance with relevant antecedents and outputs. In my first step, I examine the variance among high school and college grades for each cohort to see if it has declined over time, consistent with ceiling effects due to increasing mean grades. Next, I estimate a series of correlations to explore possible attenuation in the relationship between high school antecedents and high school grades. Lastly, I estimate two sets of models to explore possible attenuation in the relationship between grades and key outcomes: (1) logistic regression models for college

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NORC General Social Survey (GSS). GSS respondents were asked to rank the social standing of occupations from "1" for the lowest possible social standing to "9" for the highest. Nakao and Treas converted and scored these ratings in 12.5 point intervals resulting in prestige scores with a range from 0 (lowest) to 100 (highest).

[9] 29 and 39 occupational categories are available in the 1982 and 1992 cohorts, respectively. Respondents reporting a military occupation are dropped from all analyses.

entrance and completion; and (2) ordinary least squares models for occupational prestige and logged annual earnings. I present results from these models as average marginal effects. Because my educational outcomes are discrete, examining the marginal effects of grades provides a good approximation to the probability of achieving a desired educational outcome that will be produced by a 1-unit change in GPA (Long and Freese 2006). For the occupational outcomes, the marginal effect simply equals the relevant slope coefficient and change produced by a 1-unit change in GPA (Cameron and Trivedi 2009).

RESULTS

Trends in Mean Grades. Cumulative high school GPA has risen steadily between 1982 and 2002, increasing from 2.38 in 1982 to 2.66 in 2002 (an increase of approximately 12 percent; see Table 1). Conversely, when I look at postsecondary grades, I see that the mean GPA among students who attend a four-year college dropped slightly in the decades following 1972 (from 2.81 in 1972 to 2.75 in 1982 and 1992). Similarly, the mean GPA among students who attend a selective four-year college also dropped between 1972 and 1992 (from 3.16 in 1972 to 3.12 in 1982 to 3.08 in 1992), contrary to widely held beliefs that grades at selective institutions have risen in recent decades. Consequently, the answer to my first research question is simple: grades at secondary institutions have risen in the time period I examine; however, postsecondary grades have not. I now turn to my second research question, which examines the signaling aspect of grades.

Table 1: Mean and Standard Deviation for GPA Measures, by cohort

	Cohort			
	1972	1982	1992	2002
High School Graduates		**High School GPA**		
	–	2.38	2.48	2.66
	–	(0.71)	(0.69)	(0.71)
College Matriculants		**College GPA**		
All Baccalaureate	2.81	2.75	2.75	–
	(0.68)	(0.61)	(0.73)	–
Selective Baccalaureate	3.16	3.12	3.08	–
	(0.66)	(0.44)	(0.53)	–

Trends in Grade Variance. As illustrated by Table 1, the variance of high school grades remained relatively stable over the time period I examine (at approximately 0.71). In contrast, the variance in college grades increased slightly from 0.68 in 1972 to 0.73 in 1992, although the variance dropped slightly between 1972 and 1982 (from .68 to .61). The variance in grades of students attending selective college declined in the decades following 1972—particularly between 1972 and 1982 when it dropped by approximately 33 percent (from .66 to .44). Overall, my preliminary examination of the signaling component of grades illustrates stability in the distribution of grades at high schools and four-year colleges in general. However, I see a tightening of the grade distribution at selective colleges, suggesting a potential decline in the capacity of these grades at to adequately reflect variation in the academic achievement of students. To develop a more complete understanding of the signaling aspect of grades, I now examine the covariance between grades and what they purportedly represent.

Antecedents and High School Grades. Those who are concerned about grade inflation often assume that an increase in mean grades diminishes the meaning of grades in terms of their signaling power. As illustrated by Table 2, associations between high

school grades and both test scores and student effort have remained consistently robust for the cohorts I am able to observe (1982, 1992, and 2004). If anything, the relationship between test scores and high school grades may have become stronger over time, with test by GPA correlation exceeding 0.50 in 2002. While I cannot say with certainty that the signaling power of grades has increased, these descriptive results fail to provide any support to the thesis that high school grades have lost signaling power over the time period I observe.

Table 2: Correlation Coefficients and Average Marginal Effects (and standard errors) for the Relationship between GPA and Selected Measures of Academic Achievement and Employment, by cohort

	Cohort			
	1972	1982	1992	2002
A. Correlation between high school GPA and…				
Math achievement	–	0.52	0.57	0.54
Reading comprehension	–	0.46	0.51	0.51
Student report of effort in high school	–	0.24	0.23	0.24
B. Average marginal effect of high school GPA on…				
Ever attending a 4-year college	–	0.27 (0.006)	0.32 (0.008)	0.32 (0.005)
Ever attending a selective four-year college	–	0.07 (0.009)	0.15 (0.013)	0.22 (0.011)
Earning a baccalaureate degree	–	0.23 (0.011)	0.26 (0.017)	–
Nakao-Treas occupational prestige score	–	5.17 (0.261)	6.03 (0.348)	–
Logged annual earnings	–	0.22 (0.030)	0.06 (0.033)	–
C. Average marginal effect of college GPA on…				
Earning a baccalaureate degree	0.20 (0.011)	0.26 (0.018)	0.35 (0.010)	–
Nakao-Treas occupational prestige score	3.96 (0.365)	6.40 (0.529)	4.86 (0.575)	–
Logged annual earnings	0.03 (0.050)	0.05 (0.061)	0.06 (0.053)	–
D. Average marginal effect of selective college GPA on…				
Earning a baccalaureate degree	0.15 (0.034)	0.11 (0.099)	0.16 (0.034)	–
Nakao-Treas occupational prestige score	4.50 (1.207)	2.71 (2.836)	2.54 (1.649)	–
Logged annual earnings	0.15 (0.158)	0.16 (0.344)	0.11 (0.209)	–

High School Grades and Postsecondary Outcomes. Consistent with the point estimates above, the average marginal effect of high school GPA on postsecondary outcomes have remained substantial —and perhaps even increased—over time. For example, where each additional high school grade point was associated with a 27

percentage point increase in the probability of attending a baccalaureate college among students who completed high school around 1982, the marginal effects of a grade point increased to 32 percentage points by 1992 and remained at 32 percentage points in 2002. The upward trend in the relationship between high school GPA and college attendance is even greater in magnitude when I examine selective four-year college attendance. In fact, the overall relationship among high school GPA and all of the postsecondary outcomes I examined increased significantly (at the .05 level) by 2002.[10]

High School Grades and Occupational Outcomes. Looking now at the average marginal effects of high school GPA on occupational outcomes, I find mixed support regarding the signaling power of high school grades. Interestingly, the association between high school GPA and occupational prestige increased in the decades following 1982, while the association between high school GPA and logged earnings attenuated over this time period. The changes I observe here are not statistically significant at the .05 level. In sum, my examination of the relationship between high school grades and what they reflect suggests that the signaling power of high school grades has persisted over time. I will now examine the signaling power of four-year college grades.

Four-Year College Grades. The average marginal effect of four-year college GPA on timely baccalaureate degree completion has almost doubled over time, from 0.20 for the high school class of 1972 to 0.35 for the high school class of 1992. Four-year college GPA has retained—and even increased—its signaling power. Likewise, I see no evidence of attenuation in the signaling power of college grades for occupational outcomes in the

[10] I determine statistical significance using the post-estimation "suest" command in Stata.

decades following 1972. Four-year college GPA consistently predicts both occupational prestige and logged earnings. Although temporal changes in the average marginal effect of college GPA on occupational prestige do not attain statistical significance, changes in the average marginal effects on logged earnings do. Where each additional four-year college grade point was associated with a 3 percent increase in logged earnings among students who completed high school around 1972, the average marginal effect of a grade point increased slightly to 6 percent by 1992. I now turn to the signaling power of grades at selective four-year universities.

Selective Four-Year College Grades. As highlighted by Table 2, the relationship between college grades and degree completion for students attending selective colleges seems stable over the time period I examine The less pronounced effects of college GPA on completion for selective colleges relative to the broader universe of baccalaureate institutions is unsurprising given the markedly higher completion rates (and thus lower variance) for students attending selective institutions (Bowen, Chingos, and McPherson 2009; Small and Winship 2007). Turning to occupational return to GPAs of elite college graduates, I find that the average marginal effects of selective four-year college GPA on occupational prestige and logged earnings declined in the decades following 1972. Importantly, changes in the signaling power of grades at selective universities must be viewed with some caution as those changes fail to attain statistical significance.

CONCLUSION

For over a century, critics have warned that rising grades compromise the value of the signals grades carry. Is the issue of grade inflation raising grades, or a weakening of

the signals grades carry? I challenge the often implicit definition of grade inflation employed by critics, arguing that a focus solely on upward drift in the mean is inadequate for understanding the existence and pervasiveness of grade inflation in secondary and postsecondary education. Increasing average grades are irrelevant if they are not accompanied by declines in the signaling power of grades. As such, I consider not just the mean, but also the variance among grade point averages and their relationships with important precursors and outcomes. Contrary to much of the existing literature, I find virtually no support for the existence of grade inflation in secondary or postsecondary education.

This study illustrates that mean grades have risen at secondary institutions, as critics have noted, but dropped at postsecondary institutions in the decades following 1972. Furthermore, I do not observe any statistically significant attenuation in the signaling power grades over this time period. In fact, I find some evidence of an *increase* in the signaling power of grades. While it is possible that grade inflation had already run its course by the 1970s and there was a time when grades meant something more than they do today, we may find ourselves in the same position that Harvard found itself in 1894—bemoaning the fact that grades aren't what they used to be.

In this paper I addressed the question of whether or not the signaling power of grades changed between 1972 and 2004. I have not, however, made any claims about the absolute signaling power of grades. Perhaps institutions should award A's less readily and hold students to a higher standard. Readers might conclude that the correlations I report are too low and that educators should evaluate students in a way that increases the

magnitude of the empirical relationships between grades, academic effort, and labor market success. These analyses do not, and cannot, purport to identify an ideal relationship among grades and their antecedents and outputs; that is a value judgment. I fully support serious discussions about standards of grading and sympathize (even empathize) with concerns about the standards to which we hold our students. I do not, however, see any reason to believe that our grading standards are any different now than they were forty years ago.

Bibliography:

ACT. 2005. "Are High School Grades Inflated?", Iowa City.

Adelman, Clifford. 2008. "Undergraduate Grades: A More Complex Story than Inflation." in *Grade Inflation*, edited by L. H. Hunt. Albany: State University of New York Press.

Astin, Alexander. 1998. "The Changing American College Student: Thirty-Year Trends, 1966-1996." *The Review of Higher Education* 21:115-135.

Attewell, Paul, Scott Heil, and Liza Reisel. 2010. "Competing Explanations of Undergraduate Noncompletion." *American Educational Research Journal*.

Babcock, Phillip and Mindy Marks. 2011. "The Falling Time Cost of College: Evidence from Half a Century of Time Use Data." *Review of Economics and Statistics* 93.

Baird, L. 1985. "Do Grades and Tests Predict Adult Accomplishment." *Research in Higher Education* 23:3-85.

Bills, David. 2003. ""Credentials, Signals, and Screens: Explaining the Relationship Between Schooling and Job Assignment."." *Review of Educational Research* 73:447-469.

Bowen, William, Matthew Chingos, and Michael McPheron. 2009. *Crossing the Finish Line*. Princeton: Princeton University Press.

Bowen, William G., Matthew M. Chingos, and Michael McPherson. 2009. *Crossing the Finish Line*. Princeton: Princeton University Press.

Brighouse, Harry. 2008. "Grade Inflation and Grade Variation: What's All the Fuss About?" Pp. 73-91 in *Grade Infaltion: Academic Standards in Higher Education*, edited by L. H. Hunt. New York: State University of New York Press.

Camara, W., E. Kimmel, J. Scheuneman, and E. A. Sawtell. 2003. "Whose grades are inflated? ." New York.

Cameron, Colin and Pravin Trivedi. 2009. *Microeconometrics Using Stata*. College Station, TX: Stata Press.

Carr, Peggy C. 2004. "The NAEP High School Transcript Study." *Education Statistics Quarterly* 6:4-5.

Cote, James and Anton Allahar. 2007. *Ivory Tower Blues: A University System in Crisis*. Toronto: University of Toronto Press.

Filer, Randal K. 1981. "The Influence of Effective Human Capital on the Wage Equation." Pp. 367-416 in *Research in Labor Economics*, vol. 4, edited by R. E. Ehrenberg. Greenwich, Connecticut: JAI Press.

Gemus, Jonathan. 2010. "College Achievement and Earnings." in *Uppala University Department of Economics Working Paper Series*. Uppsala, Sweden.

Godfrey, Kelly. 2011. "Investigating Grade Inflation and Non-Equivalance." New York.

Johnson, Valen. 2003. *Grade Inflation. A Crisis in College Education*. New York: Springer.

Jones, Ethel B. and John D. Jackson. 1990. "College Grades and Labor Market Rewards." *Economics of Education Review* 25:253-266.

Juola, Arvo. 1976. "Grade Inflation in Higher Education: What Can or Should We Do?" in *Annual Meeting of National Council on Measurement in Education*. San Francisco, CA.
Kamber, Richard. 2008. "Understanding Grade Inflation." Pp. 45-71 in *Grade Inflation*, edited by L. H. Hunt. Albany: State University of New York Press.
Kelly, Sean. 2008. "What Types of Students' Effort Are Rewarded with High Marks." *Sociology of Education* 81:32-52.
Kohn, Alfie. 2008. "The Dangerous Myth of Grade Inflation." Pp. 1-11 in *Grade Inflation: Acadenuc Standars in Higher Education*, edited by L. H. Hunt. Albany: State University of New York Press.
Kuh, George and Shouping Hu. 1999. "Unraveling the Complexity of the Increase in College Grades from theMid-1980s to theMid-1990s." *Educational Evaluation and Policy Analysis* Fall:297-320.
Kuncel, Nathan, Marcus Credé, and Lisa L. Thomas. 2005. "The Validity of Self-Reported Grade Point Averages, Class Ranks, and Test Scores: A Meta-Analysis and Review of the Literature." *Review of Educational Research* 75:63-82.
Levine, Arthur and Jeanette S. Cureton. 1999. *When Hope and Fear Collide: A Portrait of Todays College Student*. San Francisco: Jossey-Bass.
Long, Scott J. and J. Freese. 2006. *Regression Models for Categorical Dependent Variables Using Stata*. College Station, TX: Stata Press
Loury, Linda Datcher. 1997. "The Gender Earnings Gap among College-Educated Workers." *Industrial and Labor Relations Review*:580-593.
McAllister, Charles, Xiaoyue Jiang, and Fereydoun Aghazadeh. 2008. "Analysis of Engineering Discipline Grade Trends." *Assessment and Evaluation in Higher Education* 33:167-178.
Miller, Shazia Rafiullah. 1998. "Shortcut: High School Grades As a Signal of Human Capital." *Educational Evaluation and Policy Analysis* 20:299-311.
Nakao, Keiko and Judith Treas. 1994. "Updating Occupational Prestige and Socioeconomic Scores: How the New Measures Measure Up." Pp. 1-72 in *Sociological Methodology*, edited by P. Marsden. Washington, D.C.: American Sociological Association.
Perkins, Robert, Brian Kleiner, Stephen Roey, and Janis Brown. 2004. "The High School Transcript Study: A Decade of Change in Curricula and Achievement, 1990-2000." *Education Statistics Quarterly* 6:1-11.
Pope, Justin. 2006. "Admissions Boards Face 'Grade Inflation'." in *The Washington Post*. Washington, D.C.
Rojstaczer, Stuart and Christopher Healy. 2012. "Where A is Ordinary: The Evolution of American College and University Grading, 1940-2009." *Teachers College Record* 114.
Rosenbaum, James G. 1980. "Track Misperceptions and Frustrated College Plans: An Analysis of the Effects of Tracks and Track Perceptions in the National Longitudinal Survey." *Sociology of Education* 53:74-88.

—. 2001. *Beyond College for All: Career Paths for the Forgotten Half*. New York: Russell Sage Foundation.
Schmitt, Carl M. 2009. "Documentation for the Restricted-Use NCES-Barron's Admissions Competitiveness Index Data Files: 1972, 1982, 1992, 2004, and 2008." National Center for Education Statistics, Institute for Education Sciences, U.S. Department of Education., Washington, D.C.
Small, Mario L. and Christopher Winship. 2007. "Black Students' Graduation from Elite Colleges: Institutional Characteristics and Between-Institution Differences." *Social Science Research* 36:1257-1275.
Wilson, Bradford. 1999. "The Phenomenon of Grade Inflation in Higher Education." *National Forum* 79:38-49.
Wise, David. 1975. "Academic Achievement and Job Performance." *American Economic Review* 65:350-366.
Woodruff, D. J. and D. L Ziomek. 2004. "Differential Grading Standards Among High Schools." Iowa.
Yang, H and C.S. Yip. 2003. "An Economic Theory of Grade Inflation." Pennsylvania: University of Pennsylvania.
Ziomek, Robert and Joseph Svec. 1995. "High School Grades and Achievement: Evidence of Grade Inflation." Iowa City, Iowa.