

# How Accurate Are Self-Reported High School Courses, Course Grades, and Grade Point Average?



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# Contents

<b>Abstract</b> .....	iv
<b>Introduction</b> .....	1
Literature Review .....	1
<b>Research Approach</b> .....	3
Data .....	3
Relationship between Accuracy and Student Characteristics .....	6
<b>Results</b> .....	7
Accuracy of Self-Reported Coursework .....	7
Accuracy of Self-Reported Grades .....	11
Accuracy of Self-Reported HSGPA .....	16
<b>Discussion</b> .....	18
How Accurately Do Students Self-Report High School Courses and Grade Information? .	18
Does Accuracy Differ by Student Gender, Race/Ethnicity, or Family Income Level?.....	19
<b>Conclusion</b> .....	19
<b>References</b> .....	20
<b>Appendix</b> .....	22

## Abstract

Education researchers and college admissions officials often rely on self-reported coursework and grade information provided by high school students. This study compares the self-reported course and grade information of ACT<sup>®</sup>-tested students in a midwestern state with data from their high school transcripts. The evidence shows that for the most part, students' self-reported information accurately represents their high school experience. About 94% of students accurately reported taking particular courses. The correlation between self-reported and transcript course grades was 0.66, with 96% of self-reported grades within a single letter grade of the transcript grade. High school grade point average (HSGPA) computed from self-reported course grades was highly correlated with transcript grade point average ( $r=0.83$ ). The accuracy of coursework and grades differed little by gender, race/ethnicity, and low-income status. The results indicate that self-reported coursework and grade are reasonably accurate measures for use in education research and for preliminary screening of students by college admissions officials.

Keywords: self-reported student data, high school grades, high school coursework

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## Introduction

Education researchers often study the relationship between high school coursework, grades, and admissions test scores on college enrollment and persistence, grade point average (GPA), and on-time degree completion (Adelman, 2006; Schmitt et al., 2009; Radunzel & Noble, 2012; Sanchez, 2013; Mattern, Patterson, & Wyatt, 2013). However, researchers often do not have access to high school transcript data; instead, they must rely on student self-reported course and grade information. One of the assumptions of their research is that the self-reported information adequately reflects student background and high school preparation.

College recruiters and postsecondary administrators also use student self-reported information to identify and encourage potential applicants with suitable preparation to apply to their institutions (Gonyea, 2005).<sup>1</sup> Ultimately, colleges obtain high school transcripts for making admission decisions, but self-reported information provides an efficient preliminary way to identify students adequately prepared for college. Moreover, course titles vary considerably from district to district, so postsecondary administrators may have difficulty assessing and categorizing high school coursework. A concise and comprehensive list of important courses may help postsecondary administrators efficiently identify qualified applicants.

This study examines two questions related to the accuracy of students' self-reported information:

- How accurately do students report their coursework and grades?
- Does accuracy vary by gender, race/ethnicity, family income, or ACT test score?

The remainder of the report is divided into four sections. The next section, the literature review, reviews previous research on the accuracy of high school students' self-reports of coursework and grades. This is followed by a section that describes our data and statistical approach. The results for courses taken, grades in individual courses, and overall high school GPA (HSGPA) are then presented. Finally, the results are discussed and conclusions are offered.

## Literature Review

Valiga (1987) examined the accuracy of self-reported course taking and grades for about 1,000 students from twenty-six Kentucky and Illinois high schools that registered to take the ACT in April or June of 1983. In that study, the correlations between self-reported and transcript grades ranged from 0.75 for Computer Science to 0.92 for English 11 with a median correlation of 0.86. Overall, about 80% of students accurately reported their grades.

Sawyer, Laing, and Houston (1988) assessed the accuracy of self-reported coursework and grades using data from about 1,000 ACT-tested students in the 1985–1986 academic year from fifty-three high schools. Across thirty courses, they found that the rate of accurately reporting coursework taken ranged from 65% for American Government to 97% for English 9 and 10. The median

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<sup>1</sup> Many large universities rely on student applicants to self-report their high school courses and grades (Postal, 2014; Wurth, 2013). Colleges may rely on the self-reported information for admission decisions and require students to submit official transcripts prior to enrollment. Admission decisions may be revoked if students are inaccurate in their self-reported information (Gordon, 2009).

accuracy rate across subjects was 87%. They also found that about 97% of students reported course grades that were within one letter grade of their transcript grades (e.g., A and B). Moreover, the correlations between self-reported and transcript reported grades ranged from 0.53 for Drama to 0.89 for Trigonometry with a median correlation of 0.80. The authors showed that these findings mostly held across race/ethnicity, gender, and ACT Composite score. The exceptions to this trend included somewhat greater accuracy of self-reported grades for females and for students with high ACT Composite scores.

Schiel and Noble (1991) also investigated this topic by looking at almost 2,000 students from fifty-five high schools. This study used student data taken from the 1990 October and November administrations of the P-ACT+ in a southern state.<sup>2</sup> The percentage of students accurately reporting having taken a course varied between 83% for General Mathematics and 100% for courses such as other mathematics, Astronomy, German, and other languages with a median percentage across courses of 96%. These percentages tended to be consistent across gender, minority, and P-ACT+ score ranges.<sup>3</sup> The correlations between transcript and self-reported grades ranged from 0.58 for Art to 0.85 for Spanish with a median correlation of 0.64. The percentage of students that accurately reported their high school grades ranged from 51% for General Mathematics to 83% for music. The percentage of students who reported their HSGPA within one letter grade of their transcript grades ranged from 89% for General Mathematics to 98% for Chemistry. While the correlations for males and females were similar across courses, they found that the self-reported grades of African American students were less accurate than those of White students across the P-ACT+ scale, with accuracy increasing as achievement increased.

Kuncel, Credé, & Thomas (2005) conducted a meta-analysis of thirty-seven studies that examined self-reported HSGPA, class rank, and test scores. They found that the correlations between self-reported and transcript HSGPA in English, mathematics, science, and social studies ranged from 0.80 to 0.85. They also found that the correlation between overall self-reported and actual HSGPA was 0.82. This study found that about 82% of students tended to accurately report their overall HSGPA, while about 12% and 4% over- and under-reported their overall HSGPA respectively.<sup>4</sup> While the accuracy of self-reported grades was similar for males and females, White students were found to be more accurate than nonwhite students. In addition, they found that lower-achieving students self-reported HSGPA less accurately than did students with a higher HSGPA.

Shaw and Mattern (2009) compared self-reported HSGPA at the time of SAT registration in high school for over 40,000 students with high school transcript data obtained from thirty-two colleges. They found that the average difference between students' self-reported and school-reported HSGPA was small (-0.04).<sup>5</sup> They also found a high correlation between the two HSGPA measures ( $r=0.73$ ). This study found that 52% of students accurately reported their HSGPA, and an additional 37% of students self-reported their grades within one letter grade of their school-reported grades.<sup>6</sup> These percentages were fairly consistent across gender, race/ethnicity, parental education, parental

<sup>2</sup> The P-ACT+ was the early form of the ACT Plan<sup>®</sup> test.

<sup>3</sup> This study only compared the difference between African American and White students due to low numbers of other race/ethnicities.

<sup>4</sup> These percentages, which do not sum to 100%, are based on different studies included in the meta-analysis.

<sup>5</sup> Most studies have relied on a five-point letter grade system (e.g., A, B, C, D, F), but the data in the Shaw and Mattern (2009) study included data from a twelve-point grade system with plus and minus grades (e.g., A-, B+). Our data only includes five-point letter grades.

<sup>6</sup> The exact match reported in this study was lower than that reported in other studies. One plausible explanation for this is the number of categories of HSGPA in this study. This study examined eleven grade categories (A, A-, B+, B, B-, C+, C, C-, D+, D, and E or F). This gradation of HSGPA makes it more difficult to have an exact match.

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income, and SAT score. They found higher correlations between self-reported and school-reported HSGPA for White versus African American students, for high- versus low-income students, and for students with high versus low SAT test scores. They further found that students were more accurate in their self-reported grades at the upper end of the HSGPA scale.

ACT (2013) investigated the accuracy of self-reported HSGPA for almost 2,000 ACT-tested high school students in eleven school districts from the graduating classes of 2010 and 2011. That study found that 83% of students accurately reported their HSGPA within 0.50 units, and 58% accurately reported their HSGPA within 0.25 units. Furthermore, this study found that the correlation between the HSGPA reported by the student's high school and the student's self-reported HSGPA was 0.84.<sup>7</sup> It also found that overall, students tended to over-report their HSGPA by 0.07 points. Additionally, this study found that lower-achieving students tended to over-report their HSGPA to a greater extent than did higher-achieving students.

These studies consistently show high correlations between self-reported and transcript data. However, some of the studies are over twenty years old and included small numbers of students. More recent studies have focused on HSGPA but have not examined the accuracy of self-reported coursework. This study updates the prior research on course taking and grade accuracy, while providing further information on HSGPA accuracy.

## Research Approach

### Data

This study relies on ACT test records and high school transcript data for over 15,000 students from 286 high schools in a midwestern state that were in the 2009 high school graduation class.<sup>8</sup> The ACT test record data included the Course/Grade Information Section (CGIS), which requests self-reported course enrollment and grade information for thirty high school courses in English, mathematics, science, social studies, foreign languages, and the arts. The transcript data provided by the state's department of education included details for a total of 288 high school courses. The study followed students who took ACT Plan as sophomores in 2006–2007 and had transcript data for at least four academic years from 2005–2006 through 2008–2009.<sup>9</sup> About 70% of high school students in this state take the ACT and 72% of these students enroll in college.<sup>10</sup>

In this study, we examined the accuracy of three types of student self-reported information: coursework, individual course grades, and overall HSGPA. The following paragraphs explain how we measured the accuracy of these three types of information.

To measure the accuracy of self-reported coursework, we compared the course names appearing in the students' transcripts with state sources and then mapped the 288 courses to the thirty courses listed in the CGIS of the ACT registration form. Most students take the ACT as juniors or seniors in

<sup>7</sup> These two HSGPA calculations may not, however, have included the same courses or weighting of each course.

<sup>8</sup> A limitation of the current study is that the data came from a single state where over 70% of students take the ACT. Prior ACT research has shown that the demographic composition, as well as the academic performance, of students for a given state will vary as the percentage of the tested high school population increases.

<sup>9</sup> If these students also took the ACT as seniors, we used their senior test record.

<sup>10</sup> States that have such a high testing volume, usually because of statewide testing adoption, tend to include traditional college-bound students as well as students who do not enroll in college. As such, the data set may be less representative of traditional college-bound students. The data used in this study were not from a state that had statewide testing adoption.

high school, so most students have not completed their high school coursework when they complete the ACT registration form.<sup>11</sup> The registration form asks students for courses they “have taken or am taking” and those they “have not taken but will take” before graduation. We measure the accuracy of these self-reports by comparing courses taken or planned on the survey with courses recorded on their high school transcripts.<sup>12</sup>

In some cases, multiple transcript courses mapped to a single CGIS course (see Table 1). For example, English 9, English 9 Honors, and a state-approved English 9 course were mapped to the English 9 CGIS course. Another example would be the eight possible courses that were mapped for the Trigonometry CGIS course. These courses included Trigonometry, International Baccalaureate Trigonometry, and Pre-Calculus/Trigonometry courses, as well as the honors courses. The CGIS collects specific course listings in English, mathematics, science, and social science (i.e. in core courses), but the CGIS courses in foreign languages and the arts are more generic. For example, while foreign language and music classes may have been taken for several years of high school, geometry or chemistry may have only been taken for a semester or a year.

**Table 1.** Number of Transcript Grades that Mapped to Each CGIS Course

CGIS Course	Number of Transcript Courses
<b>English</b>	
English 9	3
English 10	3
English 11	3
English 12	3
Other English	15
<b>Mathematics</b>	
Algebra 1	8
Geometry	9
Algebra 2	7
Trigonometry	8
Calculus	5
Computer Mathematics	10
Other Mathematics	9
<b>Science</b>	
General Science	11
Biology	5
Chemistry	5
Physics	9
<b>Social Studies</b>	
Geography	3
Government	8
US History	6

<sup>11</sup> About 91% of the student data in our sample was from an ACT registration form completed while the students were seniors.

<sup>12</sup> Some students self-reported English 11 and English 12, but their transcript showed state-approved advanced courses that were substitutes for these courses. In these cases, the analysis counted these courses as being consistent with the self-reported information.



**Table 1. (continued)**

CGIS Course	Number of Transcript Courses
World History	4
Economics	3
Psychology	3
Other Social Science	3
Foreign Languages	
French	9
German	7
Spanish	14
Other Foreign Language	33
Art	
Art	17
Drama	4
Music	17

If students took any of the possible transcript courses that mapped to a CGIS course, the students were considered to have reported taking the course correctly. If students reported taking a course that could not be verified in their transcript, the students were considered to have “over-reported” their course taking. If students reported not taking a course that was found in their transcript, the students were considered to have “under-reported” their course taking.

The second type of accuracy examined is that of the self-reported grades earned in individual courses. When considering grades, a similar limitation in mapping transcript data and self-reported data arises. For example, a student might take two semesters of Algebra I in high school, and the self-reported grade could reflect either semester grade or an average of the two semester grades. In the case of grades for the group of transcript courses, the highest grade reported from any acceptable course is retained as the grade for that course. Given that we do not know which course grade is being reported in the CGIS, we give the student the benefit of the highest possible grade.

Transcript course grades were recorded on a continuous scale, but the CGIS uses a discrete scale to represent grades. We converted both the transcript grades and the CGIS grades to a 5-point numeric scale (F=0, D=1, C=2, B=3, A=4) that we used to calculate agreement rates and correlations. If students reported grades corresponding to the grades from their transcript, they were considered to have correctly reported their course grades. If students reported higher grades than were found in their transcript, they were considered to have “over-reported” their course grades. If students reported lower grades than were found in their transcript, they were considered to have “under-reported” their course grades.

The final type of accuracy examined is the accuracy of a HSGPA calculated from self-reported course grades when compared to a HSGPA calculated from the student’s transcript. The calculated HSGPAs were based on twenty-three possible courses from English, mathematics, science, and social studies. Students who had fewer than ten grades reported on their transcripts were not included in the HSGPA calculation.

In addition to reporting the overall accuracy rates for course taking, course grades, and HSGPA, we examined the relationship between accuracy rates, various student background characteristics (gender, race/ethnicity, family income), and ACT Composite score. Students reported their

background characteristics when they registered for the ACT. Information on student gender and race/ethnicity had virtually no missing information. Family income was not reported by about 15% of students. Family income was imputed for students with missing family income using multiple chain methods (Little and Rubin, 2002). The imputation was based on gender, race/ethnicity, coursework taken, course grades, HSGPA, and ACT Composite and subject test scores. Family income was divided into three categories: low income (less than \$36,000), middle income (between \$36,000 and \$100,000), and high income (more than \$100,000).<sup>13</sup>

## Relationship between Accuracy and Student Characteristics

We also investigated how various student characteristics (gender, race/ethnicity, family income, and ACT Composite test score) are related to the accuracy of self-reported information, using a multinomial logit model.<sup>14</sup> The model estimates the probability of three outcomes for the accuracy of self-reported coursework and grades:

$$P_{iu} = \frac{\exp(\mathbf{x}'_i \boldsymbol{\beta}_U)}{1 + \exp(\mathbf{x}'_i \boldsymbol{\beta}_U) + \exp(\mathbf{x}'_i \boldsymbol{\beta}_O)}; \text{ Student under-reports courses/grades}$$

$$P_{ic} = \frac{1}{1 + \exp(\mathbf{x}'_i \boldsymbol{\beta}_U) + \exp(\mathbf{x}'_i \boldsymbol{\beta}_O)}; \text{ Student correctly reports courses/grades}$$

$$P_{io} = \frac{\exp(\mathbf{x}'_i \boldsymbol{\beta}_O)}{1 + \exp(\mathbf{x}'_i \boldsymbol{\beta}_U) + \exp(\mathbf{x}'_i \boldsymbol{\beta}_O)}; \text{ Student over-reports courses/grades}$$

where each response was measured relative to the base category of students correctly reporting courses or grades,

- $P_{iu}$ ,  $P_{ic}$ , and  $P_{io}$  are the probabilities for individual  $i$  of under-reporting, correctly reporting, and over-reporting, respectively.
- $\mathbf{x}_i$  is a vector of person-specific characteristics that could be related to the accuracy of self-reported course or grades.
- $\boldsymbol{\beta}_U$  and  $\boldsymbol{\beta}_O$  are parameter vectors for under- and over-reported effects, respectively, relative to correctly or accurately reporting each course or grade.

The parameters can be used for several interpretations. Each  $\boldsymbol{\beta}$  parameter indicates how a unit change in the corresponding variable affects the relative log odds ratio of under- or over-reporting relative to correct reporting. Alternatively, the exponential of each component of  $\boldsymbol{\beta}$  gives the relative risk ratio (RRR) or odds ratio of being in either the under- or over-reporting group relative to the correct reporting group. An RRR greater than one means that the individual is more likely to over- or under-report their outcome, while an RRR less than one means that the individual is less likely to over- or under-report their outcome. A final approach computes estimated probabilities of over- or under-reporting coursework or grades for discrete changes in each variable, holding constant the other variables at their means.

<sup>13</sup> Missing values were imputed for all variables using multiple chain techniques using Stata 14.1, but the analysis was conducted on the subset of observations with complete data on the dependent variables in the statistical models. Several studies have argued that the dependent variables should be included as part of the imputation procedure but then excluded from the analysis of particular dependent variables (Little and Rubin, 2002; Allison, 2001; Von Hippel, 2007; and White et al., 2011).

<sup>14</sup> In addition to the multivariate results, Appendix Tables A-2 (coursework) and A-3 (grades) describe patterns in over- or under-reporting by gender, race/ethnicity, family income, and ACT Composite test score.

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The regression analysis focused on four student characteristics that might affect the accuracy of self-reported outcomes: gender, race/ethnicity, family income, and ACT Composite test score. The regression analysis was restricted to African American, Hispanic, and White students, because the sample included few students in other categories.<sup>15</sup> Family income was divided into low income (less than \$36,000), middle income (between \$36,000 and \$100,000), and high income (more than \$100,000). ACT Composite consisted of low test scores (less than 18), middle test scores (18 to 24), and high test scores (greater than 24). These score groups roughly correspond to the lowest quartile, the middle two quartiles, and the top quartile.

The multinomial logit model was estimated separately for six subject areas: English, mathematics, science, social science, foreign language, and arts.<sup>16</sup> The specification in each area included indicator variables for different course in the area (e.g., Geometry or Algebra II). In each area, students have multiple observations depending on the number of subject area courses taken, so the regression residuals are unlikely to be independent of one another (i.e., students that exaggerate their grade in one mathematics course might be more likely than the average student to exaggerate their grades in other mathematics courses). As a result, the traditional assumption of independent residuals might lead to inappropriately small standard errors. The Huber/White sandwich estimator was used to obtain a covariance structure that is robust against this type of misspecification and that accounts for clustering through a statistical correction for correlated residuals for individual students (Huber, 1967; White, 1980; White, 1984; Froot, 1989; Rogers, 1993; Williams, 2000; Wooldridge, 2002).

A linear regression model was also used to compare the accuracy of self-reported HSGPA relative to transcript HSGPA. The model estimated transcript HSGPA as a function of self-reported HSGPA (and its square), gender, race/ethnicity, family income, and ACT Composite score. This model posits that gender, race/ethnicity, family income, and ACT Composite scores shift the relationship between self-reported and transcript HSGPA. As with the logit analysis of coursework and grades, the sample was restricted to students that were African American, Hispanic, or White. The Huber/White estimator was used to allow for possible correlated residuals within each high school.

## Results

### Accuracy of Self-Reported Coursework

In most subjects, students' self-reported coursework was very consistent with the coursework recorded on their official transcripts. Table 2 shows that self-reported course information was generally accurate more than 90% of the time. The median accuracy across all subjects was 94%.

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<sup>15</sup> For the purposes of this study, African American and White students are those students that self-identify as African American or White and not as Hispanic.

<sup>16</sup> The multinomial model was estimated using Stata 14.1.

**Table 2. Accuracy of Self-Reported High School Course Taking**

Variable	Percentage Correct	Percentage Over-Report	Percentage Under-Report	Percentage Taking Course
<b>English</b>				
English 9	95	4	1	95
English 10	98	2	0	98
English 11	99	1	0	99
English 12	93	6	1	93
<b>Mathematics</b>				
Algebra I	96	3	1	96
Geometry	98	2	0	98
Algebra II	95	5	0	91
Trigonometry	80	12	8	40
Beginning Calculus	82	18	0	11
Other Advanced Mathematics	46	52	2	17
<b>Science</b>				
General Science	95	4	1	95
Biology	99	1	0	99
Chemistry	93	6	1	76
Physics	81	18	1	22
<b>Social Studies</b>				
US History	99	1	0	99
World History	97	2	1	98
Other History	70	23	7	17
American Government	93	3	4	97
Economics	82	17	1	4
Geography	53	46	1	5
Psychology	75	23	2	16
<b>Foreign Language</b>				
Spanish	96	2	2	81
French	96	3	1	11
German	98	2	0	2
Other Language	95	3	2	2
<b>Arts</b>				
Art	84	7	9	71
Music	85	12	3	42
Drama	86	11	3	23
Median Values	94	5	1	74

Note: The entries are based on a comparison of individual course taken or planned with high school transcript data.

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Student reports were especially accurate for basic coursework often taken during the freshman or sophomore years (courses taken by over 90% of students), but they were less accurate for more advanced coursework that was taken by a smaller percentage of students. For example, Physics was taken by 22% of students, and 81% of students correctly self-reported taking the course. Similarly, only 5% of students took Geography, and self-reported course taking was accurate 53% of the time.

Several reasons could explain the reduced accuracy for advanced coursework. First, students might be embellishing their accomplishments. Students are much more likely to over-report taking or planning to take a course (i.e., the student lists the course in CGIS, but it is not on their transcript) than to under-report taking a course (i.e., the student does not list the course in CGIS, but it is on their transcript). Second, student plans might change, so students planning to take advanced coursework during their senior year might enroll in different courses than they anticipated when they completed the CGIS.<sup>17</sup> Third, the course names for advanced classes are sometimes more complicated than for fundamental coursework, so students might have difficulty mapping their coursework into CGIS categories. For example, students might not understand whether the CGIS category “Other Advanced Mathematics” should include courses like Mathematical Applications and Algorithms or Linear Systems and Statistics. Finally, some coursework might overlap between classes, so students are uncertain how the work should be classified in the CGIS. For example, a Trigonometry course might include some calculus, so the student might self-report both Trigonometry and Beginning Calculus in the CGIS. Unfortunately, we have no basis to sort between the alternative conjectures for why self-reporting is less accurate for advanced coursework.

Under-reporting of course taking varies little by gender, race/ethnicity, family income, or ACT test score (see Table 3).<sup>18</sup> African American students are more likely to under-report courses in mathematics and science, but the magnitude of the effects is only about 0.1 percentage points in mathematics and science. In contrast, African Americans are less likely to under-report foreign language coursework, but the difference is only 0.4 percentage points. Under-reporting varies little with family income. Mid- and high-level scoring students are more likely to under-report mathematics scores than low-scoring students, but they are less likely than low-scoring students to under-report science and social science coursework. These differences are generally small (i.e., less than 0.1 percentage points). In summary, under-reporting effects are often insignificant, significant effects are small, and the effect signs vary across subject areas.

<sup>17</sup> Appendix Table A-1 shows the median accuracy for courses already taken is 95%, but it is only 43% for courses that are planned. The accuracy for CGIS coursework not taken or planned is 90%. The lower accuracy for planned coursework has a small effect on overall accuracy, because only 3% of courses are planned at the time of the ACT registration survey.

<sup>18</sup> The discussion of coursework under- and over-reporting focuses on student characteristics with regression coefficients that are significantly different from zero at the 0.05 level.

**Table 3. Relative Risk Ratios and Estimated Probabilities of Under-Reporting High School Coursework by Gender, Race/Ethnicity, Family Income, and ACT Composite Range**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
<b>Relative Risk Ratios</b>						
Female	1.39	1.10	0.74*	0.93	0.87	0.95
African American	1.45	1.34*	1.79*	1.08	0.45*	1.13
Hispanic	1.80	0.97	1.14	0.93	2.67*	0.85
Income \$36,000 to \$100,000	1.12	1.10	0.93	0.94	0.75*	1.04
Income > \$100,000	1.97	1.09	1.18	1.01	1.05	1.21*
ACT Composite 18 to 24	1.31	1.61*	0.78*	0.79*	0.73*	1.09
ACT Composite > 24	1.25	1.97*	0.61*	0.60*	0.75	1.21*
<b>Estimated Probabilities</b>						
Male	0.001	0.016	0.010	0.023	0.007	0.051
Female	0.002	0.018	0.008	0.021	0.006	0.049
White	0.001	0.016	0.008	0.022	0.007	0.049
African American	0.002	0.022	0.014	0.024	0.003	0.056
Hispanic	0.003	0.016	0.009	0.020	0.018	0.042
Income < \$36,000	0.001	0.016	0.009	0.023	0.007	0.048
Income \$36,000 to \$100,000	0.002	0.018	0.008	0.022	0.005	0.050
Income > \$100,000	0.003	0.018	0.011	0.023	0.008	0.058
ACT Composite < 18	0.001	0.011	0.011	0.028	0.008	0.046
ACT Composite 18 to 24	0.002	0.018	0.009	0.022	0.006	0.050
ACT Composite > 24	0.002	0.022	0.007	0.017	0.006	0.055
Group Average	0.002	0.017	0.009	0.022	0.006	0.050

Note: Table entries are relative risk ratios and estimated probabilities from the multinomial logit regression in Appendix Table A-4. An asterisk for relative risk ratios indicates that the logit coefficient is significantly different from zero at the 0.05 level. The omitted reference categories are male, White, income < \$36,000, and ACT Composite < 18. The regressions also include indicator variables for specific courses within each group, but these values are not shown in the table.

Over-reporting coursework varies more significantly with student characteristics than under-reporting, but the effects from group to group are often less than 2 percentage points (see Table 4). African American students over-reported their coursework in all subjects but social science by about 2 to 4 percentage points relative to Whites. Over-reporting rates are about 1 to 2 percentage points higher for mid- and high-income students than for low-income students. Over-reporting for mid- and high-scoring students is more common than for low-scoring students in English and mathematics but less common in the other subject areas. The differences in over-reporting rates are generally only 1 or 2 percentage points.

These small differences in the accuracy of self-report across groups are probably of little practical importance given the high overall accuracy in most subjects. For example, a 95% accuracy versus a 93% accuracy may be statistically significant, but this small difference in accuracy is unlikely to have a substantive effect for education researchers or college administrators.

**Table 4. Relative Risk Ratios and Estimated Probabilities of Over-Reporting High School Coursework by Gender, Race/Ethnicity, Family Income, and ACT Composite Range**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
<b>Relative Risk Ratios</b>						
Female	1.08	0.99	0.86*	0.96	0.85*	1.10*
African American	1.45*	1.30*	1.52*	1.03	1.89*	1.22*
Hispanic	1.50*	1.18*	1.00	0.92	1.90*	0.86
Income \$36,000 to \$100,000	1.10	1.09*	1.12*	1.08*	0.86	0.98
Income > \$100,000	1.23*	1.15*	1.30*	1.26*	0.78	1.03
ACT Composite 18 to 24	1.21*	1.16*	0.83*	1.02	0.66*	0.86*
ACT Composite > 24	1.85*	1.18*	0.81*	0.91*	0.50*	0.67*
<b>Estimated Probabilities</b>						
Male	0.037	0.155	0.073	0.165	0.029	0.091
Female	0.040	0.153	0.063	0.158	0.024	0.100
White	0.035	0.146	0.062	0.161	0.022	0.093
African American	0.051	0.189	0.095	0.166	0.042	0.114
Hispanic	0.052	0.171	0.063	0.149	0.043	0.080
Income < \$36,000	0.036	0.145	0.062	0.151	0.029	0.097
Income \$36,000 to \$100,000	0.039	0.158	0.070	0.164	0.025	0.095
Income > \$100,000	0.044	0.167	0.081	0.190	0.022	0.100
ACT Composite < 18	0.029	0.136	0.078	0.163	0.037	0.113
ACT Composite 18 to 24	0.036	0.159	0.065	0.167	0.025	0.097
ACT Composite > 24	0.054	0.161	0.063	0.148	0.019	0.076
Group Average	0.038	0.154	0.068	0.161	0.026	0.096

Note: Table entries are relative risk ratios and estimated probabilities from the multinomial logit regression in Appendix Table A-4. An asterisk for relative risk ratios indicates that the logit coefficient is significantly different from zero at the 0.05 level. The omitted reference categories are male, White, income < \$36,000, and ACT Composite < 18. The regressions also include indicator variables for specific courses within each group, but these values are not shown in the table.

## Accuracy of Self-Reported Grades

The average transcript and self-reported grades for twenty-eight courses along with their correlations are reported in Table 5.<sup>19</sup> Correlations for the courses ranged from 0.36 for music to 0.78 for Chemistry. The correlations are higher for less advanced coursework than for more advanced courses taken during the senior year, perhaps an indication that some students are estimating final grades in some courses that they have not completed. Mathematics courses tended to have the highest correlations between self-reported and transcript grades, while art courses had the lowest correlations.

<sup>19</sup> Students do not have grades for courses that they plan to take, so the number of students used in the grading analysis is typically smaller than that of the course taking analysis (this is especially true for coursework typically taken in the senior year). For example, an individual student may plan to take or is currently taking Beginning Calculus as a senior but will not have a grade to self-report until the course is completed.

**Table 5. Descriptive Statistics for Self-Reported and Transcript Grades**

Course	Transcript Mean (Standard Deviation)	Self-Reported Mean (Standard Deviation)	Correlation	N
<b>English</b>				
English 9	3.16 (0.85)	3.21 (0.81)	0.67	13,419
English 10	3.08 (0.86)	3.16 (0.80)	0.71	13,370
English 11	3.01 (0.88)	3.15 (0.83)	0.70	9,620
English 12	3.04 (0.89)	3.27 (0.80)	0.60	4,489
<b>Mathematics</b>				
Algebra 1	3.03 (0.90)	3.11 (0.90)	0.69	13,025
Geometry	2.91 (0.96)	3.01 (0.91)	0.76	13,013
Algebra 2	2.80 (1.01)	2.94 (0.95)	0.77	11,505
Trigonometry	3.06 (0.99)	3.28 (0.84)	0.76	3,255
Calculus	3.32 (0.91)	3.41 (0.76)	0.63	768
Other Advanced Mathematics	3.05 (0.96)	3.21 (0.83)	0.58	1,283
<b>Science</b>				
General Science	3.18 (0.83)	3.28 (0.81)	0.58	12,748
Biology	3.00 (0.90)	3.09 (0.86)	0.72	13,370
Chemistry	2.89 (0.99)	2.99 (0.94)	0.78	9,274
Physics	3.20 (0.94)	3.26 (0.85)	0.66	1,880
<b>Social Studies</b>				
US History	3.20 (0.85)	3.31 (0.79)	0.63	12,718
World History	3.13 (0.87)	3.24 (0.82)	0.67	12,284
Other History	3.23 (0.88)	3.48 (0.70)	0.60	966
American Government	3.19 (0.87)	3.36 (0.79)	0.66	11,555
Economics	2.97 (1.10)	3.45 (0.76)	0.60	257
Geography	3.31 (0.92)	3.47 (0.71)	0.40	421
Psychology	3.17 (0.92)	3.41 (0.79)	0.63	1,190
<b>Foreign Language</b>				
Spanish	3.35 (0.90)	3.27 (0.90)	0.70	10,783
French	3.37 (0.88)	3.29 (0.88)	0.67	1,462
German	3.39 (0.82)	3.29 (0.87)	0.69	290
Other Language	3.32 (0.84)	3.45 (0.81)	0.73	88
<b>Arts</b>				
Art	3.57 (0.74)	3.71 (0.60)	0.51	7,559
Music	3.91 (0.40)	3.90 (0.37)	0.36	5,192
Drama	3.54 (0.81)	3.73 (0.59)	0.52	2,366

Note: All correlations are significant ( $p < 0.0001$ ).

Table 6 shows the percentage of students who reported the same letter grades as their transcript grades, reported grades within one letter grade of their transcript grades (i.e., adjacent grades), under-reported their transcript grades, and over-reported their transcript grades. The percentages of students who reported the same letter grades as their transcripts tended to be similar across courses. The exact grade agreement rate ranged from 58% for English 12 to 93% for music with



the median agreement rate of 68%.<sup>20</sup> The exact/adjacent agreement rates were very high for all courses examined. The exact/adjacent agreement rate ranged from 91% for economics to 100% for other foreign languages. In English, mathematics, science, and social studies, more students tended to under-report their grades than over-report them. For these courses, the percentage of students who under-reported their transcript grades ranged from 15% for Trigonometry to 30% for economics with a median under-reporting rate of 20%. Few students over-reported grades for arts coursework, but a fair number (about one-fifth) of students over-reported their foreign language grades.

**Table 6. Transcript and Self-Reported Coursework Grade Agreement Rates**

Course	Exact Agreement	Exact/Adjacent Agreement	Percent Under-Reporting	Percent Over-Reporting
<b>English</b>				
English 9	66	96	18	16
English 10	68	97	18	14
English 11	66	97	17	17
English 12	58	95	25	17
<b>Mathematics</b>				
Algebra 1	64	95	19	17
Geometry	68	97	18	14
Algebra 2	68	96	18	14
Trigonometry	73	97	15	11
Calculus	69	97	21	11
Other Advanced Mathematics	59	94	23	17
<b>Science</b>				
General Science	63	94	21	16
Biology	67	97	19	14
Chemistry	70	97	17	13
Physics	67	96	19	14
<b>Social Studies</b>				
US History	65	96	21	14
World History	65	96	21	14
Other History	70	95	22	8
American Government	68	96	20	12
Economics	65	91	30	6
Geography	60	93	24	15
Psychology	65	94	28	7
<b>Foreign Language</b>				
Spanish	69	96	9	21
French	67	97	10	23
German	69	97	9	22
Other Language	75	100	14	11

<sup>20</sup> Music has a high grade match rate (93%) and a relatively low correlation (0.36) between transcript and CGIS grades. These unusual results in music reflect the fact that over 90% of music students received and self-reported an "A" in music. This lack of variability in music grades drives down the estimated correlation.

**Table 6.** (continued)

Course	Exact Agreement	Exact/Adjacent Agreement	Percent Under-Reporting	Percent Over-Reporting
Arts				
Art	76	96	16	8
Music	93	99	3	4
Drama	75	96	18	7
Median	67	96	20	14

The under-reporting of course grades varies somewhat with student characteristics (see Table 7).<sup>21</sup> Under-reporting rates are about 5 percentage points lower for females than for comparable males. African Americans are more likely to under-report grades than Whites in English, social sciences, foreign languages, and especially in the arts. The magnitude of the difference is about 2 to 3 percentage points, except for a 6 percentage point difference in the arts. Under-reporting rates were about 2 to 3 percentage points lower for mid- and high-income students than for low-income students in English, mathematics, and science. Under-reporting rates for mid-scoring students were about 10 percentage points lower in all subject areas than for low-scoring students. High-scoring students had under-reporting rates about 17 to 22 percentage points lower than those of low-scoring students.

**Table 7.** Relative Risk Ratios and Estimated Probabilities of Under-Reporting High School Grades by Gender, Race/Ethnicity, Family Income, and ACT Composite Range

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
Relative Risk Ratios						
Female	0.74*	0.75*	0.73*	0.78*	0.64*	0.55*
African American	1.11*	1.00	1.04	1.13*	1.19*	1.61*
Hispanic	0.90	0.91	0.87	0.93	0.52*	0.98
Income \$36,000 to \$100,000	0.91*	0.92*	0.85*	0.94	1.06	0.97
Income > \$100,000	0.92	0.88*	0.82*	0.98	0.90	1.00
ACT Composite 18 to 24	0.64*	0.63*	0.66*	0.66*	0.45*	0.50*
ACT Composite > 24	0.27*	0.26*	0.25*	0.31*	0.12*	0.18*
Estimated Probabilities						
Male	0.208	0.208	0.220	0.237	0.119	0.154
Female	0.154	0.157	0.161	0.185	0.076	0.085
White	0.177	0.180	0.187	0.204	0.094	0.103
African American	0.195	0.180	0.195	0.231	0.112	0.166
Hispanic	0.159	0.165	0.162	0.191	0.049	0.101
Income < \$36,000	0.189	0.190	0.206	0.215	0.093	0.115
Income \$36,000 to \$100,000	0.172	0.174	0.175	0.202	0.098	0.112
Income > \$100,000	0.173	0.168	0.169	0.210	0.083	0.116
ACT Composite < 18	0.268	0.299	0.298	0.316	0.195	0.207
ACT Composite 18 to 24	0.173	0.189	0.196	0.209	0.089	0.104

<sup>21</sup> The discussion of grade under- and over-reporting focuses on relative risk ratios associated with regression coefficients that are significantly different from zero.

**Table 7. (continued)**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
ACT Composite > 24	0.073	0.077	0.075	0.100	0.023	0.036
Group Average	0.179	0.180	0.187	0.208	0.095	0.114

Note: Table entries are relative risk ratios and estimated probabilities from the multinomial logit regression in Appendix Table A-5. An asterisk for relative risk ratios indicates that the logit coefficient is significantly different from zero at the 0.05 level. The omitted reference categories are male, White, income < \$36,000, and ACT Composite < 18. The regressions also include indicator variables for specific courses within each group, but these values are not shown in the table.

As shown in Table 8, grade over-reporting rates also vary with gender, race/ethnicity, family income, and test score for most subject areas. Females were less likely to over-report their grades than males – the gap is 7 percentage points for foreign languages, but about 1 to 2 percentage points for English, mathematics, science, and social studies. Grade over-reporting varied little with race/ethnicity. Over-reporting was less common among middle-income students than among low-income students (about 1 to 2 percentage points). High-income students had over-reporting rates 3 to 4 percentage points lower than those of low-income students. Holding other factors constant, over-reporting rates were 5 to 8 percentage points lower for mid-scoring students than for low-scoring students. Over-reporting for high-scoring students is 22 percentage points lower in foreign languages and 8 percentage points lower in the arts than for low-scoring students.

**Table 8. Relative Risk Ratios and Estimated probabilities of Over-Reporting High School Grades by Gender, Race/Ethnicity, Family Income, and ACT Composite Range**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
<b>Relative Risk Ratios</b>						
Female	0.89*	0.91*	0.88*	0.86*	0.70*	0.57*
African American	1.06	1.08	1.07	1.33*	0.92	1.40*
Hispanic	1.13	0.99	1.18*	1.17*	0.85	1.33
Income \$36,000 to \$100,000	0.91*	0.88*	0.83*	0.89*	0.95	0.82*
Income > \$100,000	0.79*	0.80*	0.73*	0.78*	0.80*	0.63*
ACT Composite 18 to 24	0.75*	0.75*	0.75*	0.72*	0.73*	0.53*
ACT Composite > 24	0.35*	0.36*	0.38*	0.32*	0.30*	0.25*
<b>Estimated Probabilities</b>						
Male	0.159	0.149	0.155	0.134	0.247	0.081
Female	0.142	0.136	0.137	0.116	0.174	0.046
White	0.148	0.140	0.142	0.117	0.209	0.056
African American	0.156	0.151	0.152	0.155	0.194	0.078
Hispanic	0.167	0.139	0.168	0.137	0.177	0.074
Income < \$36,000	0.160	0.154	0.163	0.134	0.216	0.069
Income \$36,000 to \$100,000	0.146	0.136	0.135	0.119	0.205	0.057
Income > \$100,000	0.126	0.124	0.119	0.104	0.172	0.043
ACT Composite < 18	0.203	0.206	0.205	0.180	0.306	0.104
ACT Composite 18 to 24	0.153	0.154	0.153	0.129	0.223	0.055
ACT Composite > 24	0.071	0.075	0.077	0.058	0.090	0.026
Group Average	0.150	0.142	0.145	0.124	0.206	0.061

Note: Table entries are relative risk ratios and estimated probabilities from the multinomial logit regression in Appendix Table A-5. An asterisk for relative risk ratios indicates that the logit coefficient is significantly different from zero at the 0.05 level. The omitted reference categories are male, White, income < \$36,000, and ACT Composite < 18. The regressions also include indicator variables for specific courses within each group, but these values are not shown in the table.

## Accuracy of Self-Reported HSGPA

The average HSGPA calculated from transcript grades (3.08) and self-reported grades (3.16) were similar, and both measures had a standard deviation of 0.59. There was a high correlation between HSGPA calculated from self-reported grades and transcript grades ( $r=0.84$ ).

We examined how transcript HSGPA in core courses varied with self-reported HSGPA (in quadratic form), gender, race/ethnicity, family income, and ACT composite score. The results are reported in Table 9.

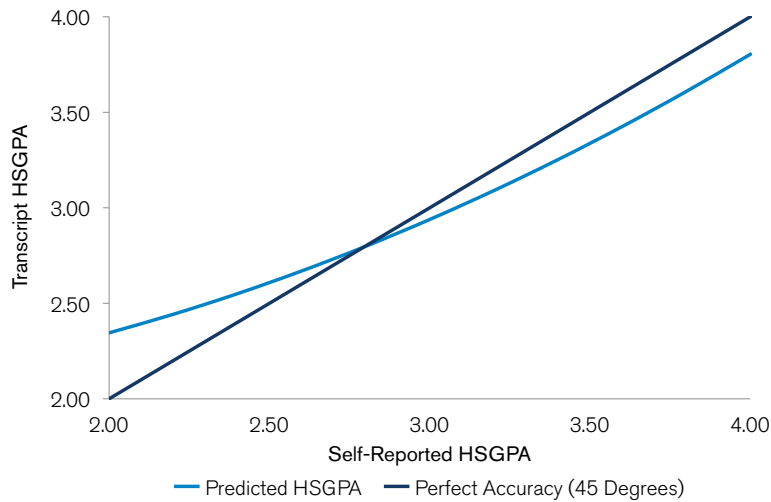
**Table 9.** Regression Coefficients for Modeling Transcript HSGPA

	Coefficient
Self-Reported GPA	-0.0845 (0.0459)
Self-Reported GPA Squared	0.136* (0.00764)
Female	0.0953* (0.00647)
African American	-0.0174 (0.0133)
Hispanic	-0.00193 (0.0189)
Income \$36,000 to \$100,000	0.0106 (0.00716)
Income > \$100,000	0.00645 (0.0114)
ACT Composite 18 to 24	0.158* (0.00999)
ACT Composite > 24	0.276* (0.0132)
Constant	1.778* (0.0689)
Observations	12,771

*Notes:* Table entries are coefficients from a linear regression, which uses a Huber/White sandwich estimator to adjust for a possible correlated residuals by high school. Standard errors are in parentheses. An asterisk indicates that the coefficient is significantly different from zero at the 0.05 level. The omitted reference categories are male, White, income < \$36,000, and ACT Composite < 18.

Other things being equal, low-performing students (as measured by self-reported HSGPA) under-reported their “true” transcript HSGPA, while high-performing students over-reported their HSGPA (see Figure 1).<sup>22</sup> For example, a self-reported HSGPA of 2.0 is associated with a transcript HSGPA of 2.34, and a self-reported HSGPA of 3.5 is associated with a transcript HSGPA of 3.34. The average self-reported score is 3.16 (the median is 3.21), and this is slightly higher than the transcript grade of 3.06 (transcript grade of 3.10 at median).

<sup>22</sup> A potential concern is that the statistical model might be distorted, because HSGPA was truncated at 4.0. We estimated an alternative statistical model to explicitly account for this upper limit in the dependent variable (Wooldridge, 2002). The parameter and standard error estimates from the truncated model were similar to those reported here.



**Figure 1.** Relationship between self-reported and transcript HSGPA, accounting for gender, race/ethnicity, family income group, and test score group

The regression results show that the accuracy of self-reported HSGPA varies significantly with gender and ACT Composite group but not with race/ethnicity or family income. For a given self-reported HSGPA, females have a transcript HSGPA about 0.10 points higher than otherwise comparable males. Similarly, mid- and high-scoring students have predicted transcript HSGPAs about 0.16 or 0.28 points higher, respectively, than comparable students with low self-reported HSGPAs.

Since the relationship between transcript and self-reported HSGPA is curvilinear, the extent of over-/under-reporting differs with the self-reported HSGPA. Table 10 shows the predicted transcript HSGPA when self-reported HSGPA is 3.15 (the average self-report) and 2.33 (the 10th percentile of self-reports). At the mean self-reported HSGPA of 3.15, most students over-reported their transcript HSGPA, but some over-reported by more than others. Females with a self-reported HSGPA of 3.15 have a predicted transcript HSGPA of 3.10, as compared with 3.00 for males (i.e. both genders over-reported, but males over-reported by more than females). Reporting accuracy does not vary significantly with race/ethnicity or family income (see regression results in Table 9). Among students with a self-reported HSGPA of 3.15, transcript HSGPA was 3.19 for students with high ACT Composite scores as compared with 3.07 and 2.92, respectively for students with mid-level or low-test scores.

**Table 10. Predicted Transcript HSGPA by Student Characteristics, Holding Constant Self-Reported HSGPA at 3.15 and 2.33**

Characteristics	Self-Reported HSGPA	
	3.15 (Average)	2.33 (10th Percentile)
Male	3.00	2.46
Female	3.10	2.55
White	3.06	2.51
African American	3.04	2.50
Hispanic	3.06	2.51
Income < \$36,000	3.05	2.51
Income \$36,000 to \$100,000	3.06	2.52
Income > \$100,000	3.06	2.51
ACT Composite < 18	2.92	2.37
ACT Composite 18 to 24	3.07	2.53
ACT Composite > 24	3.19	2.65

*Note:* Table entries are predicted transcript HSGPA for each group of students holding other variables (except self-reported HSGPA) constant at their means.

For low levels of self-reported HSGPA, students under-predict their transcript HSGPA. For a self-reported HSGPA of 2.33, females have a predicted transcript HSGPA of 2.55 as compared with 2.46 for males. The accuracy of self-reported HSGPA does not vary significantly with race/ethnicity or family income. Higher-scoring students understate their HSGPA more than lower-scoring students: For a self-reported HSPGA of 2.33, the predicted transcript HSGPA is 2.37 for lower-scoring students, 2.53 for middle-scoring students, and 2.65 for high-scoring students.

## Discussion

### How Accurately Do Students Self-Report High School Courses and Grade Information?

Overall, students' self-reported coursework and grades are accurate representations of actual coursework taken and grades. The median coursework accuracy was 94% across all English, mathematics, science, social studies, foreign language, and arts classes. Accuracy was highest for more fundamental coursework such as English 11, Algebra II, Chemistry, and World History.

Compared to prior studies that have examined the accuracy of self-reported coursework taking, the current study found very similar results. While there are certainly variations among the courses examined, this study confirms the findings of prior studies that there is substantial accuracy in self-reported coursework.

While the correlation between self-reported course grades and transcript grades varied considerably across courses, the median correlation for all courses was moderate (0.66). This suggests fairly good accuracy across courses. Among courses, the median percentage of students who self-reported the exact letter grades as their transcripts was also relatively high (67%). If we included self-reporting within a letter grade that median percentage was 96%. We also saw that students tended to under-report their grades more than they over-reported their grades.

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When a HSGPA was calculated based on all self-reported grades, the correlation with transcript HSGPA was high,  $r=0.83$ . This suggests that a HSGPA based on self-reported course-level grades is a good analog for a HSGPA based on transcript-reported course-level grades. We also found that students on the lower end of the self-reported HSGPA scale, below about 2.5, tend to under-report their true HSGPA while students on the upper end of the self-reported HSGPA scale tend to slightly over-report their true transcript HSGPA.

The median percentage of students across courses in the current study who self-reported their grades exactly was similar to that found by previous studies. That said, the correlations between self-reported and transcript grades found in the current study tended to be lower than those found for similar prior research when course level grades were examined. When overall HSGPA was examined, the correlation was consistent with prior research, with the exception of Shaw and Mattern (2009), which found a lower correlation than other studies.<sup>23</sup>

## Does Accuracy Differ by Student Gender, Race/Ethnicity, or Family Income Level?

We found that the accuracy of self-reported coursework tended to be fairly similar for the student subgroups examined. There was little to no difference in the rates of accuracy of self-reported coursework between males and females. Hispanic students tended to under-report their coursework slightly (relative to White students) for a handful of the courses examined; African American students tended to under-report their coursework slightly for most courses.

Larger differences in accuracy were observed in the rates of self-reported grades exactly matching transcript grades for student subgroups. While female students were more likely to report their exact course grades, minority (African American and Hispanic) and low-income students were less likely than White and other income students, respectively, to report their exact course grades.

The accuracy of self-reported HSGPA differed for some groups of students. Females had predicted transcript HSGPA about 0.10 points higher than those of males with comparable self-reported HSGPA. Similarly, mid- and high-scoring students had a predicted transcript HSGPA about 0.16 and 0.28 points higher, respectively, than low-scoring students with the same self-reported HSGPA. Neither race/ethnicity nor family income levels were significantly related to the accuracy of self-reported HSGPA.

## Conclusion

Based on our findings, coursework taken and overall HSGPA provided by students can be a good measure of academic preparation and achievement for researchers and postsecondary administrators. We find that using self-reported coursework taken is a reliable way to estimate course-specific student-level experiences. A measure of caution, however, is appropriate for the use of course-specific student-level grades. For the overall HSGPA of an individual, we have a stronger basis for trusting self-reported values depending upon the purpose and use of self-reported HSGPA. Self-reported course-specific grades earned should always be confirmed by transcript grades for high-stakes student-level decisions. Regardless of these student-level cautions, self-reported coursework and grades earned appear to be reasonably valid measures for preliminary outreach decisions and for aggregate research. ■

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<sup>23</sup> The lower correlation in Shaw and Mattern (2009) may reflect the finer HSGPA gradations (plus and minus grades) than in the other studies.

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## Appendix

### Tables A-1 through A-5

**Table A-1.** Percentage of Student Correctly Identifying Coursework by Whether Course Is Taken or Planned at Time of ACT Test

Course	Taken		Planned		Not Taken or Planned		Overall	
	Prob	N	Prob	N	Prob	N	Prob	N
<b>English</b>								
English 9	0.954	14,800	1.000	8	0.125	8	0.953	14,816
English 10	0.978	14,792	0.929	14	0.000	8	0.978	14,814
English 11	0.994	14,504	1.000	297	0.000	18	0.993	14,819
English 12	0.941	11,136	0.919	3,509	0.274	117	0.930	14,762
<b>Mathematics</b>								
Algebra I	0.966	14,678	0.923	13	0.551	78	0.964	14,769
Geometry	0.985	14,585	0.951	102	0.378	98	0.980	14,785
Algebra II	0.957	13,696	0.708	513	0.893	515	0.946	14,724
Trigonometry	0.893	4,595	0.379	1,911	0.856	7,473	0.803	13,979
Beginning Calculus	0.694	1,805	0.155	2,211	0.996	9,835	0.822	13,851
Other Advanced Mathematics	0.264	7,425	0.160	2,311	0.939	4,447	0.459	14,183
<b>Science</b>								
General Science	0.963	14,483	0.760	50	0.504	248	0.954	14,781
Biology	0.990	14,725	0.980	49	0.026	39	0.987	14,813
Chemistry	0.973	11,001	0.488	1,050	0.953	2,440	0.934	14,491
Physics	0.811	3,229	0.180	2,270	0.977	8,509	0.809	14,008
<b>Social Studies</b>								
US History	0.987	14,519	0.984	253	0.032	31	0.985	14,803
World History	0.983	14,167	0.940	447	0.325	169	0.974	14,783
Other History	0.356	3,428	0.179	1,256	0.898	9,119	0.698	13,803
American Government	0.978	13,409	0.875	648	0.033	609	0.935	14,666
Economics	0.250	1,625	0.089	1,278	0.989	10,862	0.818	13,765
Geography	0.083	6,362	0.072	699	0.979	7,038	0.530	14,099
Psychology	0.511	3,414	0.181	1,822	0.964	8,691	0.751	13,927
<b>Foreign Language</b>								
Spanish	0.991	11,835	0.227	321	0.928	2,449	0.964	14,605
French	0.961	1,699	0.039	380	0.996	11,790	0.966	13,869
German	0.927	358	0.010	292	0.999	13,094	0.977	13,744
Other Language	0.538	195	0.005	368	0.986	13,109	0.953	13,672
<b>Arts</b>								
Art	0.915	9,573	0.657	682	0.715	4,201	0.845	14,456
Music	0.798	7,120	0.212	349	0.937	6,638	0.849	14,107
Drama	0.755	3,660	0.173	774	0.953	9,467	0.857	13,901
Median Values	0.948	10,287	0.434	480	0.896	3,325	0.940	14,474

**Table A-2. Accuracy of Self-Reported Coursework by Subject Area and Student Characteristics**

Subject Area/Student Characteristic	Percentage Under-Report	Percentage Correct	Percentage Over-Report
<b>English</b>			
Male	0.17	96.07	3.76
Female	0.16	95.95	3.89
White Non-Hispanic	0.18	96.14	3.69
African American	0.12	95.00	4.87
Hispanic	0.09	97.75	2.16
Income < \$36,000	0.17	96.10	3.73
Income \$36,000 to \$100,000	0.16	96.05	3.80
Income > \$100,000	0.17	95.52	4.31
Composite < 18	0.16	96.44	3.39
Composite 18 to 24	0.18	96.18	3.64
Composite > 24	0.13	95.14	4.73
<b>Mathematics</b>			
Male	1.63	83.12	15.25
Female	1.81	82.74	15.45
White Non-Hispanic	1.73	83.10	15.17
African American	1.91	81.90	16.20
Hispanic	0.85	83.43	15.72
Income < \$36,000	1.67	83.07	15.26
Income \$36,000 to \$100,000	1.76	82.87	15.36
Income > \$100,000	1.76	82.59	15.65
Composite < 18	1.19	84.13	14.68
Composite 18 to 24	1.77	82.71	15.52
Composite > 24	2.21	82.05	15.74
<b>Science</b>			
Male	1.18	91.24	7.58
Female	0.61	93.31	6.07
White Non-Hispanic	0.90	92.60	6.51
African American	0.79	90.90	8.32
Hispanic	0.86	93.36	5.78
Income < \$36,000	0.92	92.22	6.86
Income \$36,000 to \$100,000	0.86	92.46	6.68
Income > \$100,000	0.79	92.28	6.93
Composite < 18	1.28	90.70	8.02
Composite 18 to 24	0.86	92.95	6.19
Composite > 24	0.48	92.87	6.65
<b>Social Science</b>			
Male	2.34	81.33	16.33
Female	2.11	81.95	15.94
White Non-Hispanic	2.13	81.48	16.38
African American	2.61	82.16	15.23
Hispanic	2.45	83.25	14.30

**Table A-2.** (continued)

Subject Area/Student Characteristic	Percentage Under-Report	Percentage Correct	Percentage Over-Report
Income < \$36,000	2.38	81.87	15.75
Income \$36,000 to \$100,000	2.13	81.63	16.24
Income > \$100,000	2.06	81.03	16.91
Composite < 18	2.64	81.41	15.95
Composite 18 to 24	2.28	81.44	16.28
Composite > 24	1.66	82.34	15.99
<b>Foreign Languages</b>			
Male	0.68	96.67	2.66
Female	0.60	96.79	2.60
White Non-Hispanic	0.68	97.56	1.76
African American	0.19	93.18	6.63
Hispanic	1.63	93.75	4.61
Income < \$36,000	0.68	95.73	3.59
Income \$36,000 to \$100,000	0.60	97.32	2.07
Income > \$100,000	0.66	97.56	1.78
Composite < 18	0.86	93.56	5.58
Composite 18 to 24	0.59	97.62	1.79
Composite > 24	0.52	98.11	1.37
<b>Arts</b>			
Male	5.46	85.17	9.37
Female	4.62	85.58	9.79
White Non-Hispanic	5.22	85.56	9.22
African American	4.27	84.08	11.65
Hispanic	3.76	87.61	8.63
Income < \$36,000	4.56	85.29	10.16
Income \$36,000 to \$100,000	5.22	85.48	9.30
Income > \$100,000	5.68	85.26	9.06
Composite < 18	3.58	84.71	11.71
Composite 18 to 24	5.52	84.99	9.48
Composite > 24	5.48	86.90	7.62

**Table A-3. Accuracy of Self-Reported Grades by Student Characteristics in Each Subject Area**

Subject Area/Student Characteristic	Percentage Under-Report	Percentage Correct	Percentage Over-Report
<b>English</b>			
Male	20.08	64.93	15.00
Female	16.09	68.90	15.01
White Non-Hispanic	16.37	69.42	14.21
African American	23.74	58.70	17.57
Hispanic	22.26	58.87	18.88
Income < \$36,000	20.29	62.84	16.87
Income \$36,000 to \$100,000	16.64	69.26	14.10
Income > \$100,000	14.72	73.30	11.98
Composite < 18	24.26	56.55	19.19
Composite 18 to 24	18.29	66.07	15.64
Composite > 24	8.50	83.65	7.85
<b>Mathematics</b>			
Male	20.28	65.62	14.10
Female	16.07	69.70	14.23
White Non-Hispanic	16.55	69.91	13.54
African American	24.63	58.58	16.79
Hispanic	22.01	60.57	17.42
Income < \$36,000	20.62	63.40	15.98
Income \$36,000 to \$100,000	16.88	69.75	13.37
Income > \$100,000	14.28	73.78	11.95
Composite < 18	26.45	54.85	18.70
Composite 18 to 24	20.19	64.37	15.44
Composite > 24	8.04	83.21	8.75
<b>Science</b>			
Male	20.85	64.36	14.79
Female	16.97	68.83	14.20
White Non-Hispanic	17.32	69.25	13.44
African American	25.59	56.34	18.07
Hispanic	19.63	58.82	21.55
Income < \$36,000	21.44	61.91	16.65
Income \$36,000 to \$100,000	17.46	69.06	13.48
Income > \$100,000	14.93	73.60	11.47
Composite < 18	28.09	51.81	20.10
Composite 18 to 24	20.22	64.86	14.93
Composite > 24	7.81	83.44	8.75
<b>Social Science</b>			
Male	22.60	64.88	12.51
Female	19.39	68.32	12.29
White Non-Hispanic	18.91	69.75	11.34
African American	28.51	54.40	17.09
Hispanic	27.52	58.65	13.83

**Table A-3. (continued)**

Subject Area/Student Characteristic	Percentage Under-Report	Percentage Correct	Percentage Over-Report
Income < \$36,000	23.28	62.37	14.35
Income \$36,000 to \$100,000	19.57	68.94	11.50
Income > \$100,000	17.82	72.67	9.50
Composite < 18	27.75	55.46	16.79
Composite 18 to 24	21.64	64.77	13.60
Composite > 24	12.43	81.86	5.71
<b>Foreign Languages</b>			
Male	10.94	66.41	22.65
Female	8.32	72.73	18.95
White Non-Hispanic	8.39	72.11	19.50
African American	15.71	60.11	24.18
Hispanic	7.23	64.92	27.86
Income < \$36,000	11.27	65.99	22.74
Income \$36,000 to \$100,000	8.64	71.58	19.78
Income > \$100,000	6.98	76.19	16.82
Composite < 18	18.51	53.46	28.03
Composite 18 to 24	9.14	68.65	22.21
Composite > 24	2.64	85.99	11.36
<b>Arts</b>			
Male	15.68	76.91	7.41
Female	8.30	86.64	5.07
White Non-Hispanic	9.28	86.03	4.69
African American	22.14	65.77	12.10
Hispanic	6.63	86.68	6.69
Income < \$36,000	14.09	78.13	7.77
Income \$36,000 to \$100,000	10.01	84.88	5.11
Income > \$100,000	7.69	88.33	3.98
Composite < 18	21.97	67.65	10.38
Composite 18 to 24	10.26	84.29	5.45
Composite > 24	2.65	94.62	2.73

**Table A-4. Multinomial Logit Estimates for Modeling Over- and Under-Reporting High School Coursework**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
<b>Under-Report</b>						
Female	0.332 (0.223)	0.0973 (0.0570)	-0.301* (0.0985)	-0.0751 (0.0465)	-0.144 (0.106)	-0.0503 (0.0482)
African American	0.372 (0.313)	0.291* (0.0846)	0.583* (0.125)	0.0725 (0.0643)	-0.788* (0.199)	0.125 (0.0703)
Hispanic	0.589 (0.413)	-0.0280 (0.152)	0.129 (0.236)	-0.0742 (0.112)	0.983* (0.169)	-0.165 (0.137)
Income \$36,000 to \$100,000	0.111 (0.270)	0.0927 (0.0687)	-0.0722 (0.122)	-0.0568 (0.0554)	-0.290* (0.132)	0.0439 (0.0576)
Income > \$100,000	0.680 (0.439)	0.0824 (0.108)	0.168 (0.204)	0.0139 (0.0915)	0.0474 (0.190)	0.192* (0.0909)
Composite 18 to 24	0.271 (0.277)	0.479* (0.0797)	-0.242* (0.113)	-0.234* (0.0548)	-0.311* (0.130)	0.0896 (0.0620)
Composite > 24	0.226 (0.369)	0.678* (0.0948)	-0.487* (0.172)	-0.509* (0.0752)	-0.284 (0.167)	0.191* (0.0755)
English 10	0.127 (0.267)					
English 11	0.999* (0.384)					
English 12	2.620* (0.424)					
Geometry		-0.0166 (0.612)				
Algebra II		2.569 (0.510)				
Trigonometry		5.771 (0.501)				
Beginning Calculus		2.520* (0.525)				
Other Advanced Mathematics		4.933* (0.505)				
Biology			-1.201* (0.189)			
Chemistry			0.0336 (0.134)			
Physics			0.786* (0.119)			
World History				1.334 (0.210)		
Other History				3.883* (0.193)		

**Table A-4.** (continued)

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
American Government				3.061* (0.193)		
Economics				1.608* (0.211)		
Geography				2.260* (0.208)		
Psychology				2.682* (0.197)		
French					-1.301* (0.171)	
German					-3.430* (0.454)	
Other Languages					0.146 (0.110)	
Music						-1.028* (0.0595)
Drama						-0.951* (0.0582)
Constant	-8.328* (0.592)	-8.689* (0.512)	-4.545* (0.149)	-5.929* (0.197)	-3.952* (0.171)	-2.439* (0.0729)
<b>Over-Report</b>						
Female	0.0748 (0.0574)	-0.0149 (0.0254)	-0.152* (0.0375)	-0.0429 (0.0243)	-0.166* (0.0776)	0.0940* (0.0357)
African American	0.371* (0.0949)	0.262* (0.0400)	0.420* (0.0541)	0.0324 (0.0367)	0.637* (0.0974)	0.202* (0.0495)
Hispanic	0.403* (0.144)	0.162* (0.0668)	0.00312 (0.0974)	-0.0781 (0.0628)	0.641* (0.153)	-0.153 (0.0966)
Income \$36,000 to \$100,000	0.0992 (0.0724)	0.0830* (0.0311)	0.116* (0.0446)	0.0780* (0.0287)	-0.152 (0.0917)	-0.0232 (0.0415)
Income > \$100,000	0.208* (0.101)	0.137* (0.0478)	0.259* (0.0690)	0.228* (0.0449)	-0.253 (0.164)	0.0295 (0.0676)
Composite 18 to 24	0.194* (0.0893)	0.152* (0.0346)	-0.182* (0.0471)	0.0215 (0.0308)	-0.420* (0.0897)	-0.148* (0.0435)
Composite > 24	0.615* (0.102)	0.166* (0.0409)	-0.209* (0.0583)	-0.0965* (0.0388)	-0.695* (0.129)	-0.395* (0.0578)
English 10	-0.833* (0.0584)					
English 11	-2.057* (0.109)					
English 12	0.356* (0.0505)					
Geometry		-0.624* (0.0706)				



**Table A-4. (continued)**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
Algebra II		0.417* (0.0576)				
Trigonometry		1.448* (0.0540)				
Beginning Calculus		1.797* (0.0522)				
Other Advanced Mathematics		3.492* (0.0502)				
Biology			-1.303* (0.0848)			
Chemistry			0.482* (0.0583)			
Physics			1.759* (0.0519)			
World History				0.339* (0.0992)		
Other History				3.261* (0.0784)		
American Government				0.709* (0.0937)		
Economics				2.797* (0.0796)		
Geography				4.222* (0.0768)		
Psychology				3.153* (0.0788)		
French					0.278* (0.0718)	
German					-0.0434 (0.0757)	
Other Languages					0.323* (0.0706)	
Music						0.532* (0.0430)
Drama						0.411* (0.0425)
Constant	-3.472* (0.111)	-3.572* (0.0591)	-3.232* (0.0624)	-4.389* (0.0830)	-3.417* (0.110)	-2.381* (0.0563)
Observations	55,588	81,031	54,539	93,740	52,480	39,864

Notes: Table entries are coefficients from a multinomial logit regression, where a Huber/White sandwich estimator is used to adjust for common student-level residual variance. Standard errors are in parentheses. An asterisk indicates that the logit coefficient is significantly different from zero at the 0.05 level. The omitted reference categories are male, White non-Hispanic, income < \$36,000, ACT composite < 18, English 9 (for English), Algebra I (for Mathematics), General Science (for Science), US History (for Social Sciences), Spanish (for Foreign Languages), and Art (for Arts).

**Table A-5. Multinomial Logit Estimates for Modeling Over- and Under-Reporting High School Course Grades**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
<b>Under-Report</b>						
Female	-0.301* (0.0318)	-0.284* (0.0309)	-0.314* (0.0329)	-0.245* (0.0312)	-0.448* (0.0668)	-0.599* (0.0566)
African American	0.101* (0.0425)	-0.00279 (0.0437)	0.0437 (0.0453)	0.121* (0.0434)	0.177* (0.0886)	0.478* (0.0716)
Hispanic	-0.108 (0.0808)	-0.0896 (0.0765)	-0.140 (0.0850)	-0.0674 (0.0802)	-0.647* (0.181)	-0.0157 (0.137)
Income \$36,000 to \$100,000	-0.0909* (0.0367)	-0.0885* (0.0366)	-0.164* (0.0389)	-0.0618 (0.0368)	0.0568 (0.0791)	-0.0295 (0.0669)
Income > \$100,000	-0.0877 (0.0642)	-0.123* (0.0616)	-0.201* (0.0662)	-0.0217 (0.0600)	-0.108 (0.137)	0.000595 (0.117)
Composite 18 to 24	-0.441* (0.0364)	-0.460* (0.0375)	-0.417* (0.0389)	-0.413* (0.0374)	-0.788* (0.0770)	-0.685* (0.0627)
Composite > 24	-1.298* (0.0579)	-1.357* (0.0532)	-1.381* (0.0576)	-1.156* (0.0525)	-2.150* (0.133)	-1.738* (0.114)
English 10	-0.0282 (0.0310)					
English 11	-0.155* (0.0362)					
English 12	0.353* (0.0437)					
Geometry		-0.145* (0.0315)				
Algebra II		-0.0605 (0.0331)				
Trigonometry		-0.0669 (0.0573)				
Beginning Calculus		0.503* (0.101)				
Other Advanced Mathematics		0.341* (0.0774)				
Biology			-0.186* (0.0305)			
Chemistry			-0.237* (0.0364)			
Physics			0.00754 (0.0680)			
World History				0.000471 (0.0307)		
Other History				0.203* (0.0860)		

**Table A-5. (continued)**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
American Government				-0.0505 (0.0317)		
Economics				0.369* (0.144)		
Geography				0.309* (0.127)		
Psychology				0.437* (0.0723)		
French					0.200 (0.104)	
German					0.0335 (0.242)	
Other Languages					0.681 (0.400)	
Music						-1.856* (0.0920)
Drama						0.183* (0.0667)
Constant	-0.658* (0.0458)	-0.487* (0.0457)	-0.373* (0.0468)	-0.569* (0.0461)	-1.030* (0.0903)	-0.747* (0.0732)
<b>Over-Report</b>						
Female	-0.113* (0.0321)	-0.0891* (0.0322)	-0.125* (0.0337)	-0.146* (0.0357)	-0.353* (0.0472)	-0.559* (0.0726)
African American	0.0539 (0.0439)	0.0781 (0.0454)	0.0645 (0.0480)	0.285* (0.0483)	-0.0783 (0.0702)	0.338* (0.0948)
Hispanic	0.119 (0.0742)	-0.00689 (0.0759)	0.166* (0.0755)	0.159* (0.0786)	-0.167 (0.109)	0.284 (0.158)
Income \$36,000 to \$100,000	-0.0899* (0.0385)	-0.128* (0.0373)	-0.185* (0.0408)	-0.119* (0.0419)	-0.0519 (0.0555)	-0.193* (0.0844)
Income > \$100,000	-0.240* (0.0676)	-0.221* (0.0654)	-0.317* (0.0677)	-0.251* (0.0748)	-0.225* (0.0953)	-0.459* (0.178)
Composite 18 to 24	-0.285* (0.0374)	-0.293* (0.0395)	-0.291* (0.0407)	-0.334* (0.0417)	-0.313* (0.0591)	-0.643* (0.0833)
Composite > 24	-1.048* (0.0593)	-1.016* (0.0546)	-0.974* (0.0557)	-1.134* (0.0633)	-1.218* (0.0811)	-1.385* (0.135)
English 10	-0.199* (0.0350)					
English 11	-0.0506 (0.0379)					
English 12	0.0409 (0.0499)					
Geometry		-0.259* (0.0359)				

**Table A-5. (continued)**

	English	Mathematics	Science	Social Science	Foreign Languages	Arts
Algebra II		-0.203* (0.0376)				
Trigonometry		-0.243* (0.0640)				
Beginning Calculus		-0.154 (0.132)				
Other Advanced Mathematics		0.211* (0.0840)				
Biology			-0.227* (0.0357)			
Chemistry			-0.242* (0.0403)			
Physics			-0.0856 (0.0760)			
World History				-0.0222 (0.0375)		
Other History				-0.446* (0.132)		
American Government				-0.193* (0.0397)		
Economics				-0.874* (0.279)		
Geography				0.348* (0.144)		
Psychology				-0.565* (0.123)		
French					0.157* (0.0725)	
German					0.109 (0.158)	
Other Languages					-0.542 (0.424)	
Music						-0.844* (0.0861)
Drama						-0.132 (0.0983)
Constant	-0.952* (0.0478)	-0.886* (0.0495)	-0.827* (0.0509)	-1.066* (0.0521)	-0.499* (0.0691)	-1.377* (0.0938)
Observations	37,885	39,547	34,432	36,457	11,644	13,940

Notes: Table entries are coefficients from a multinomial logit regression, where a Huber/White sandwich estimator is used to adjust for common student-level residual variance. Standard errors are in parentheses. An asterisk indicates that the logit coefficient is significantly different from zero at the 0.05 level. The omitted reference categories are male, White non-Hispanic, income < \$36,000, ACT composite < 18, English 9 (for English), Algebra I (for Mathematics), General Science (for Science), US History (for Social Sciences), Spanish (for Foreign Languages), and Art (for Arts).









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