Grade Discrepancy Project: Can CMS Grade-book Data Improve Student Learning?  
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Drawing upon survey and grade data from six sections of three courses, University of Minnesota researchers have found, using paired t-tests, that when surveyed on the last day of class undergraduate students expect to receive significantly higher grades than they actually receive ($p < .0001$).

```
.do ttest expgrade == grade4o
```

Paired t test

```
                      Variable |     Obs     Mean    Std. Err.    Std. Dev.   [95% Conf. Interval]
-------------------------------+---------------------------------------------+--------------------------+--------------------------+--------------------------+--------------------------+
                             expgrade |     434  3.223502   .0340065   .7084451   3.156664    3.290341
                             grade4o |     434  2.352535   .0385356   .8027985   2.276795    2.428275
                             diff  |     434   .8709677  .0385157   .8023841   .7952668    .9466687
-------------------------------+---------------------------------------------+--------------------------+--------------------------+--------------------------+--------------------------+
```

The gap between the expected and actual grades we found, which ranged from 0.5 to 1.4 standard deviations per course, was predicted significantly by aptitude as measured by composite ACT scores, with higher achieving students more accurately than their lower achieving counterparts using an ordered logistic regression model.

```
.do estsimp ologit gradegap act
```

Ordered logit estimates

```
Ordered logit estimates  Number of obs =    198
LR chi2(1) =     6.26  Prob > chi2 =    0.0123
Log likelihood =  -186.95546  Pseudo R2 =    0.0165
```

```
gradegap |   Coef.  Std. Err.      z    P>|z|     [95% Conf. Interval]
----------+---------------------------------------------+--------------------------+--------------------------+--------------------------+
     _cut1 |  -6.796794   1.216088          (Ancillary parameters)
     _cut2 |  -3.373544   1.060208
     _cut3 |  -.2689195   1.02802
----------+---------------------------------------------+--------------------------+--------------------------+--------------------------+
```

Using this model to generate 1,000 simulated data points, we generated a table of predicted probabilities that provide a clearer picture of how student aptitude is related to the gap between students’ actual and expected grades (see Figure 1). Students of all abilities have about a 50% chance of overestimating their final grades by one (1) full letter grade while almost no students underestimate their final grades by one (1) full letter grade. However, the probability of accurately predicting a final grade on the last day of class increases by 18% as ACT scores increase from 15 to 35. Conversely, the probability of overestimating one’s final grade by two (2) letter grades decreases from 34% to 15% as ACT scores increase by the same amount.
Such overestimation has been linked to reduced student performance, possibly by depressing the amount of effort students exert on final exams, papers, and projects (Clayson, 2005; Kruger & Dunning, 1999; Balch, 1992). Students who overestimate their expected grades may not prepare adequately for their final exams, papers, and assignments, thereby increasing the probability that the gap between their actual and expected grades is larger. Using data from our course management systems, we are exploring whether the use of an online grade-book can serve as a mitigating factor for helping lower achieving students estimate their final grades more accurately, thereby giving students better information to guide their preparation for end-of-term exams, papers, and projects.

References

