A Brief Report: The Relationship between Mid-Semester Grades and Final Grades

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This short report describes the various trajectories in grades that students earn at three points in time, at Academic Status Report (ASR; 6th week of the semester), at Mid-Term Progress Report (MTPR; 11th week of the semester), and at final grade. The objective of this project was to determine if the trajectories in grades of students remain stable or are unstable throughout the semester. We compiled a database of students who took General College courses during Fall 2003. Included were students who had received an ASR, MTPR, and a final grade; students were excluded if they did not have a recorded grade at all three time points. The sample included 1722 students in 53 different courses; the specific courses are listed in Appendix A.

Grades Across Time Points
We wanted to determine if there was a correlation between grades at different time points. The pearson correlation was statistically significant between ASR grade and MTPR grade ($r = .758$; $p < .001$). The correlation between ASR grade and final grade was also statistically significant ($r = .601$; $p < .001$). There was also a strong correlation between the MTPR grade and final grade ($r = .749$; $p < .001$). The average grade across students was lowest at MTPR, with the average student earning a C+ ($M = 2.555$). The highest average grade point was at final grade, with the average student earning a B- ($M = 2.816$). The average grade point at ASR was 2.651, indicating that the average student earned a C+. Thus, it appears that students do remain on stable trajectories and their previous grades on the reports do predict their final grades.

By Discipline
Correlations between time points were also calculated according to discipline. Table one displays the correlations, broken down by discipline. Each of these correlations was statistically significant at the .001 level. Table two displays the average grade earned by students in each discipline.

Table 1: Correlations between ASR, MTPR, and Final Grade

Discipline	ASR/MTPR	ASR/Final Grade	MTPR/Final Grade
Communication	$r = .698$	$r = .594$	$r = .786$
Freshman Seminars	$r = .798$	$r = .642$	$r = .781$
Humanities	$r = .699$	$r = .466$	$r = .675$
Math	$r = .740$	$r = .615$	$r = .777$
Science	$r = .777$	$r = .495$	$r = .640$
Social Science	$r = .750$	$r = .680$	$r = .813$
Other	$r = .682$	$r = .521$	$r = .591$

Table 2: Average grade for each discipline at each time point

Discipline	Mean at ASR	Std Dev at ASR	Mean at MTPR	Std Dev at MTPR	Mean at Final Grade	Std Dev at Final Grade
Communication	3.105 (N = 1118)	.945	2.924 (N = 1118)	1.012	2.981 (N = 1098)	1.050
Freshman Seminars	3.193 (N = 252)	.966	3.232 (N = 252)	.870	3.547 (N = 250)	.817
Humanities	2.899 (N = 728)	1.065	2.767 (N = 728)	1.093	3.007 (N = 713)	1.040
Math	2.638 (N = 817)	1.337	2.373 (N = 817)	1.377	2.672 (N = 780)	1.194
Science	1.929 (N = 868)	1.373	1.878 (N = 868)	1.293	2.405 (N = 824)	1.153
Social Science	2.452 (N = 1254)	1.231	2.498 (N = 1254)	1.243	2.660 (N = 1212)	1.152
Other	2.848 (N = 321)	1.178	2.778 (N = 321)	.991	3.243 (N = 320)	.990

We put together two tables that display potential pathways for students, and frequency of students in each of those pathways. These are displayed in tables three and four. For the purpose of producing a manageable table, minuses and pluses were excluded. So, for example, students receiving a B- or a B+ were coded as receiving a B. Using the B students as an example, table three demonstrates that 782 students who received a B+, B, or B- on their ASR, received a B+, B, or B- on their final grade. 446 students who received a B+, B, or B- on their ASR, received greater than a B+ on their final grade, and 367 students received lower than a B-.

From these tables it is evident that students generally improve their grades, or remain in the same grade bracket, rather than lower their grades between time points. Of particular interest are the D and F groups. Most students who earned a D or F on their ASR improved their grades by the final grade. Most students who earned a D on their MTPR improved their grade by the final grade. There was a group of students who did not improve their F grades from the MTPR; however it is important to note that the majority of these students also earned an F on the ASR, indicating that they may have dropped out of the class without officially withdrawing. These pathways indicate that students may use feedback from earlier reports to improve their grades by the end of the course.

Table 3: ASR Grade to Final Grade

A to A: 1168
A to < A: 568
B to > B: 446
B to B: 782
B to < B: 367
C to > C: 461
C to C: 402
C to < C: 141
D to > D: 256
D to D: 58
D to < D: 68
F to > F: 320
F to F: 166

Table 4: MTPR Grade to Final Grade

A to A: 1247
A to < A: 248
B to > B: 424
B to B: 1046
B to < B: 247
C to > C: 425
C to C: 537
C to < C: 103
D to > D: 271
D to D: 73
D to < D: 59
F to > F: 267
F to F: 246
(F,F,F = 145)

Withdrawals

161 students withdrew from a class, and therefore are not included in the above tables. Of the students who withdrew, the grades on the ASR were: 8 A's, 14 B's, 39 C's, 22 D's, and 78 F's. The grades on the MTPR were: 2 A's, 5 B's, 20 C's, 25 D's, and 109 F's.

Do the ASR and MTPR add unique predictions to the final grade?

We attempted to answer this question by two different methods. First, we examined descriptive data to determine if students who were earning low grades at the beginning of the semester improved their grades at mid-semester or at final grade. This may be an indication of whether or not each of these reports motivates students to improve their grade. The second method we used was using multiple regression analyses to explore the unique effects of each variable.

Table five demonstrates where students improved their grades. Included in this analysis were students who began the semester with a C- or below, and received higher than a C- by the end of the semester. Most of the students who received a C- on their ASR and earned over a C- by their final grade, improved their grade by their MTPR report (67%). However, the opposite was true for students who began the semester by earning an F. If these students earned a passing final

grade, they increased their grade between the MTPR and final grade. For those students earning D's, a little over half improved their grade after their MTPR report, and a little under half improved their grade after receiving their ASR report. A distinction should be made between this analysis, and the descriptive information presented in tables 3 and 4. In tables 3 and 4, the numbers indicate improvement in grades to another grade level. In table 5, the numbers indicate students who changed their grade from a C- or lower to a grade above C-.

Table 5: Improvement from C- or Lower to Above a C-

	ASR to MTPR	MTPR to Final	Total
C-	96 (67%)	48 (33%)	144
D	98 (45%)	121 (55%)	219
F	67 (30%)	155 (70%)	222

We used multiple regression to explore the unique effects that each variable added to the prediction of the final grade. The term "unique effects" is defined as the effect from one variable that is over and above the effects of the other variable, as well as the overlap in variance provided by each variable. Unique effects can be determined by calculating part correlations, which are equal to the square root of the effect size (R^2) for each variable. Examination of the part correlations demonstrates that both the ASR and MTPR add unique variance in predicting the final grade. The MTPR has a larger effect size, or part correlation, than the ASR. However, the combination of the squared part correlations equals .206, quite a bit less than the R^2 (.752). This indicates that much of the prediction of final grade is bound in the overlap between the ASR and MTPR grades. Thus the combination of the two grades is the strongest predictor. Using the part correlation, we can conclude that each mid-term progress report provides some useful information; however it is the two reports together that best predict the final grade.

Table 6: Prediction of Final Grade

Predictor	Unstandardized Coefficient	Standardized Coefficient	t-value	Part Correlation
ASR Grade	.082	.088	6.338	.058
MTPR Grade	.642	.683	49.308	.451

$R^2 = .752$

Conclusion

This report attempted to examine the predictive utility of the ASR and MTPR reports and study the stability of trajectories. It was determined that students typically have a stable pattern over the course of the semester. This was true across disciplines. However, when students do change their grades, they usually improve them. There are several possible reasons for this. One potential reason is that students may use the mid-term report system to inform and motivate themselves to improve. How they use the report may depend on the type of student they are. For example, the C- students appear to immediately find ways to improve their grade, whereas the F students may wait until the end of the term to bring their grade up. However, there are several other potential reasons for students to improve over time, such as more assignments to base the grade on, procrastination, and interventions or encouragement from advisors.

Appendix A: General College Courses included in Analysis
GC 0712 Introductory Algebra, Part 1
GC 0721 Introductory Algebra
GC 0722 Introductory Algebra, Computer
GC 0731 Intermediate Algebra
GC 0732 Intermediate Algebra, Computer
GC 1041 Developing College Reading
GC 1051 Introduction to College Writing: Workshop
GC 1076 Career Planning Strategies
GC 1081 Academic Development Seminar: Supplemental Instruction in Social Sciences
GC 1082 Academic Development Seminar: Supplemental Instruction in the Sciences
GC 1083 Academic Development Seminar: Supplemental Instruction in the Humanities
GC 1086 Freshman Seminar
GC 1112 Ecological Evaluation of Environmental Problems
GC 1131 Principles of Biological Science
GC 1135 Human Anatomy and Physiology
GC 1163 Physical Systems: Principles and Practice
GC 1166 Principles of Chemistry
GC 1171 Physical Geology
GC 1173 Geology of the National Parks
GC 1211 People and Problems
GC 1231 U.S. Growth and National Power
GC 1233 U.S. Government and Politics
GC 1235 Law in Society
GC 1251 World History: Since 1500
GC 1281 General Psychology
GC 1285 Introduction to Cultural Anthropology
GC 1311 Art: General Art
GC 1364 Literature: The American Immigrant Experience
GC 1365 Literatures of the United States
GC 1371 Reading Short Stories
GC 1374 The Movies
GC 1421 Writing Laboratory: Basic Writing
GC 1422 Writing Laboratory: Communicating in Society
GC 1454 Statistics
GC 1456 Functions and Problems of Logic
GC 1461 Oral Communication in the Public Sphere
GC 1481 Creativity Art Laboratory: Experiences in the Media
GC 1485 Creativity: Photography
GC 1511 Introduction to Business and Society
GC 1513 Principles of Small Business Operations
GC 1534 Practical Law
GC 1540 Accounting
GC 1571 Introduction to Microcomputer Applications
GC 1816 African-American Literature
GC 1836 Asian-American Literature
GC 1851 Multicultural Relations

GC 1902 Freshman Seminar: Cultural Diversity (Reading Poems, The Art of Aging)
GC 1903 Freshman Seminar: Citizenship and Public Ethics (Understanding Creative Evolution)
GC 1905 Freshman Seminar (Chess and Critical Thinking)
GC 1909 Freshman Seminar: International Perspectives (War and Peace in Vietnamese Literature)
GC 1910 Freshman Seminar (Women of Mathematics)
GC 2283 Psychology of Human Development
GC 2357 World Religious Beliefs