Effects of Elapsed Time between College Precalculus and Calculus on Calculus Grades

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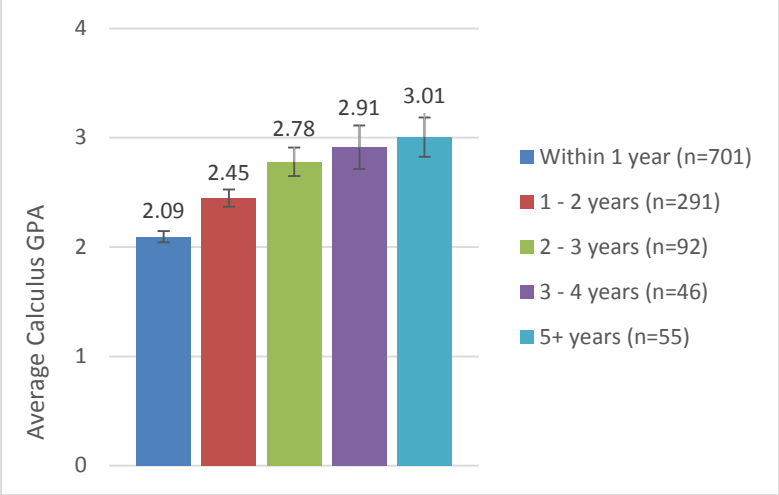
This research brief is the third in a series of UEPC studies that explores post-secondary math education in Utah as part of the STEM pipeline.

Effects of Elapsed Time

The sample included 1,185 Utah students who passed Precalculus in one academic year and enrolled in Calculus with no intervening math classes. **Results showed that elapsed time was significantly related to Calculus grades.**

Figure 1. Average Calculus GPA by Elapsed Time Since Precalculus



Effects of Other Factors

Using the same sample, simple correlations between Calculus grades and 15 demographic and academic factors indicated that all factors except gender, race, and age predicted Calculus grades. When all factors were considered simultaneously, the relationship between elapsed time and Calculus grades did not change. This indicates that the relationship could not be accounted for by interrelationships with other factors. Although cumulative high school GPA, ACT math scores, and Precalculus grades had a stronger relationship with Calculus grades than elapsed time, elapsed time was a significant predictor of Calculus grades.

Figure 2. Simple Relationships between Calculus Grades and Other Factors

Factors	What predicts higher Calculus grades?	Strength of Relationship (Effect Size)
Gender, Race/Ethnicity, or Age	*No significant relationships*	None
College Algebra attempts	Fewer attempts	0.5%
College Trigonometry attempts	Fewer attempts	1.3%
Precalculus in high school or college	High school	1.5%
HS Pre-Algebra standardized test score	Higher scores	2.3%
HS Algebra standardized test score	Higher scores	2.8%
HS Geometry standardized test score	Higher scores	3.4%
Time between Precalculus and Calculus	**More elapsed time**	**3.7%**
Cumulative HS GPA	Higher GPAs	6.1%
ACT math score	Higher scores	6.3%
Precalculus grades	Higher scores	19.6%

Conclusion

The relationship between elapsed time and Calculus grades is not easily explained. It is unlikely that elapsed time leads to positive outcomes in and of itself. There may be other factors that can account for our findings, such as policies governing admittance into Calculus. Due to the importance of Calculus as a gateway to STEM degrees, future studies are needed to understand what may account for the increases in Calculus grades associated with time delays. Future studies could explore time-based enrollment policies and the effects of interim activities on Calculus grades.