

Experimental Evidence on First-year Experience, Mentoring, and Divergent Levels of Need Among Pell-Eligible Students

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Background

Low-income students, including Pell-eligible students, complete college at a much lower rate (49% at 4-year universities) than their higher-income peers (67%). One popular policy response is the introduction of First-Year Experience (FYE) courses or seminars (Al-Sheeb, Abdulwahed, & Hamouda, 2018, Yan & Sendall, 2015). At the same time, researchers have paid an increasing amount of attention to how non-cognitive attributes impact low-income students' behaviors and chances of performing and persisting throughout college (Evans, Kearney, Perry, & Sullivan, 2017). Emergent in individual contemporary studies, researchers have found financial distress (Lim, Heckman, Montalto, & Letkiewicz, 2014), food insecurity (Goldrick-Rab, Richardson, & Hernandez, 2017), motivation (Kori, et al, 2015), and engagement (Collier, Parnther, & Beach, 2018) factor into low-income students' performance and persistence.

Purpose

Funded by the First in the World Grant and designed to meet the standards of What Works Clearinghouse (WWC), Broncos FIRST! (BF) is a random-assignment protocol aimed to study the effects that a specially designed full-year FYE combined with a mentoring experience may have on Pell-eligible students' non-cognitive beliefs, social and academic engagement, college performance, and first-year retention. Strongly designed (causal) studies on the topic are limited, as only four studies (Campbell & Campbell, 1997, Rodger & Tremblay, 2003, Salinity, 2005, and Sorrentino, 2007) meet WWC standards and examine college student academic

achievement, credit accumulation, and persistence (Institute of Education Sciences, 2018). Our study contributes to the body of knowledge surrounding effects of first-year experience and mentoring on low-income students' non-cognitive attributes, performance, and persistence.

Setting & Population

All Pell-eligible students who were freshmen at Western Michigan University (WMU) in Fall 2017 were contacted; those who consented to participate (N=186) were randomly assigned to either the control group or one of the two treatments. The students were about 45% White, 40% African American, and 15% another race; more female than male; with a mean SAT score of 1001 and a mean high school GPA of 3.29. Relative to all 2017 freshmen at WMU, this group of students is more likely to be non-White and have marginally lower average entrance scores. The BF population, though, is descriptively similar to first-time freshmen at 4-year universities across the US.

Intervention

WMU implemented two variations in the BF treatment, both of which were two-semester seminars. Students were randomly assigned to one of two mentoring treatments: Community Mentorship or Professional Learning Communities. The Community Mentorship program was delivered through a FYE course. Students engaged in mentoring circles based on career aspirations and common personal attributes. The second mentoring intervention was a reciprocal mentoring intervention by faculty and staff who participated as members of a Professional Learning Communities (PLC's). These PLC's not only provided mentorship to First-Year students, but used these experiences to create an action research project leading to creating resources and projects around student success. Each of these FYE treatments was worth one credit and was scheduled to meet weekly.

Research Design

This study was a Randomized Control Design (RCT). Students were placed in the control or intervention conditions by random assignment (lottery design) by an external evaluator. In experimental designs, differences in outcomes between the groups are attributable to the treatment. Balance tests confirmed that students were well-randomized on observable characteristics.

Data Collection and Analysis

We were able to draw on multiple rich sources of administrative data from WMU, as well as survey responses. In addition to demographics (gender and race), university records showed students' prior academic performance, including high school GPA, SAT and/or ACT scores. Data on students' performance at university allowed us to examine a variety of outcomes: GPA and credits earned in Fall, in Spring, and in freshman year overall, as well as persistence to a 2nd semester and to a 2nd year. The survey data allowed us to generate composites of seven non-cognitive factors: cognitive engagement, behavioral engagement, amotivation, grit, financial stress, faculty interaction, staff interaction, and peer relationships. We conducted OLS linear regression for continuous outcomes (e.g. GPA), and logistic regression for binary outcomes, in order to view not only the treatment effect but also the relationships of the survey constructs to outcomes.

Findings

The prior year of the same treatments – which also followed a random assignment protocol – showed modest, but statistically and substantively significant, effects of the treatment especially on persistence to year 2. In the Fall 2017 freshman cohort, though, the treatments showed no effect on any of GPA, cumulative GPA, persistence to spring semester, or persistence

to sophomore year. Treated students did accumulate about one more credit, but since the treatment itself was a one-credit course, that finding was not illuminating. Somewhat unexpectedly, the non-cognitive composites – several of which have shown important relationships with achievement and attainment in other studies – also did not, in full models, show a relationship to student outcomes. However, food insecurity did. Students with greater food insecurity had lower GPAs in their first semester (controlling for academic ability and all other covariates), marginally-significantly lower GPAs in second semester, and lower rates of persistence to year 2. Table 1 shows standardized coefficients for regression models with outcome variables of fall GPA, spring GPA, and cumulative year 1 GPA. Table 2 shows odds ratios from logistic regression analyses with an outcome of persistence to sophomore year, employing three different approaches to controlling for prior achievement.

Table 1. Results for Continuous Outcomes.

	Continuous Outcomes		
	Fall GPA	Spring GPA	Overall GPA
Treatment	-.05	-.01	-.03
Female	.16+	.18+	.20*
African American	-.02	-.13	-.13
Other Minority	.05	-.15	-.11
SAT	.11	.13	.12
Food Insecure	-.25*	-.21+	-.21+
Amotivation	-.10	.18	.13
Grit	-.32	.08	-.01
Financial Stress	-.03	-.10	.01
Cognitive Engagement	-.01	.14	.19
Peer Relationships	-.52	-.19	-.32
Behavioral Engagement	1.47+	.06	.37
Faculty Interaction	-.89	-.39	-.43
Staff Interaction	.71	.35	.56
Treatment	.30	-.02	.21

Standardized coefficients. + $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$

Table 2. Results for Persistence to Sophomore Year.

	Multivariate Logistic Regression Models, with Varied Controls for Prior Achievement		
	SAT	None	HS GPA
Treatment	1.22	1.17	1.43
Female	1.49	1.40	1.33
African American	2.67+	2.33+	3.85**
Other Minority	.89	.96	1.03
SAT	1.00		
HS GPA			2.69***
Food Insecure	.37	.29*	.34+
Amotivation	1.27	1.22	1.12
Grit	.55	.52	.39
Financial Stress	1.40	1.65	1.86+
Cognitive Engagement	1.25	1.20	2.04
Peer Relationships	3.37+	3.14+	3.21
Behavioral Engagement	2.91	3.49	1.81
Faculty Interaction	.46	.45	.41
Staff Interaction	.86	.76	.75
Staff Interaction	.86	.76	.75

*Odds ratios.. +p < .10. *p < .05. **p < .01. *** p < .001*

Conclusions

These findings emphasize the importance of students' basic needs. Limited recent analysis finds that Pell eligibility is a flawed proxy for need, both under-counting low-income students and counting some middle-income students as low-income (Delisle 2017). Our findings indicate that food insecurity's impact on student achievement and persistence is greater than the importance of in-vogue non-cognitive factors or a popular, year-long treatment. If supported by future analyses, these findings suggest that students' more basic needs like food security and stable housing may need to be elevated above a certain level of sufficiency before other college supports can make a real difference for students.

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