Financial stress and its impact on first-year students' college experiences

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Abstract

This study examined the relationship between undergraduate engagement and financial stress coping strategies. The study found that students who evidenced financial stress perceived a less supportive campus environment, but tended to participate in more academically beneficial activities. The results indicated that magnitude of the impact of financial stress varied by the type of financial stress coping strategy used.

Financial Stress and its Impact on First-year Students' College Experiences

Over the last few decades, higher education financing has changed dramatically. This shift arguably began with the Higher Education Act of 1992 which prioritized loans over need-based grants (Hannah, 1996). Additionally, state government spending on other priorities, particularly Medicaid, has resulted in reduced higher education appropriations to public institutions (Kane, Orszag, & Gunter, 2003). Consequently, the cost of college has outpaced the inflation rate (Baum & Ma, 2012). These trends have forced students and parents to shoulder an increasing proportion of the college cost burden. However, family incomes have declined after accounting for inflation (Baum & Ma, 2012) and many parents are unable to take on these additional costs.

The developments above have forced students to assume an increasing share of the costs of college. This is best observed in the rapid rise in the amount of student debt accumulated per borrower (Baum & Payea, 2012). Yet, the average student is financially vulnerable as they typically have few assets and paltry incomes. Much research has also demonstrated that students have little financial knowledge (Avard, Manton, English, & Walker, 2005; Berkner & Wei, 2006; Chen & Volpe, 1998; Murphy, 2005). Consequently, it is not surprising that financial stress is a leading stressor among undergraduates (American College Health Association, 2013).

This study builds off previous work that identified four ways first-year students cope with financial stress (Fosnacht, 2013). It extends this analysis by comparing the college experiences of these students to peers that did not evidence financial stress.

Literature Review

Financial Stress among College Students

Students may experience financial stress for a variety of reasons. The most obvious is due to the cost of attending college. In 2003, about 45 percent of dependent students had unmet need, the gap between the net cost of college (after including all sources of aid) and the expected family contribution (Long & Riley, 2007). The gap was not trivial, as the average unmet need was approximately $6,000. Unmet need is particularly problematic for students as they typically face credit constraints[1] (Becker, 1993; Belley & Lochner, 2007) and have little financial knowledge (Avard et al., 2005; Chen & Volpe, 1998; Murphy, 2005). Even if a student does not have any unmet need, most undergraduates rely upon substantial loans to finance their college educations. While students are not required to repay their loans while enrolled in college, the typical bachelor's graduate with a loan amassed nearly $24,000 in student loan debt (Baum & Payea, 2012). Students may worry about their ability to earn enough income to repay their loans, particularly in an era of high unemployment for young adults.

Other possible sources of financial stress include unforeseen emergencies or expenses, like a hospital bill or car accident. As students generally have few savings, they do not have extra money to pay for unexpected expenses. A parent may also lose a job and be unable to contribute to their child's education, increasing a student's responsibility for paying for their college expenses. Students may also experience stress from balancing their school and work responsibilities. Over the past few decades, more traditional age students are working and working substantially more hours (Scott-Clayton, 2012). Therefore, an increasing number of students must balance the need to work to pay for the college or living expenses and the need to study.

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[1] The inability to borrow enough money for one's needs. Due to their low incomes and lack of collateral, students typically have difficulty borrowing to pay for college expenses at reasonable rates. The federal student loan programs were created to help students borrow on reasonable terms.

College students frequently experience financial stress. According to a recent national survey, 35 percent of students said their finances were "traumatic" or "very difficult" to handle (American College Health Association, 2013). Students only more frequently cited academics as a stressor causing the same level of distress. However, only nine percent of students indicated that financial worries affected their academic performance.

A survey focusing specifically on financial stress found that four of the five most common stressors among students related to their personal finances (Trombitas, 2012). First-year students more frequently experienced "extreme" or "high stress" related to the cost of education and living than other students. A third of students also said that finances negatively influenced their academic performance and progress, a rate substantially higher than the study above. Additionally, one out of five students reduced the number of courses they enrolled in due to their finances.

A predecessor to this study found that about 70 percent of first-year undergraduates surveyed evidenced financial stress (Fosnacht, 2013). Among these students, it identified four latent ways or types that students cope with financial stress. The first group, *financially stressed, no impact*, was comprised of students concerned about paying for college and their regular expenses, but did not change their behavior due to their finances. Students belonging to the second group, *financially stressed, low impact*, reported worrying about money and investigated working and/or borrowing more. Members of the *financially stressed, medium impact* group were stressed, choose not to participate in activities due to a lack of money, investigated working more, and believed that their financial concerns interfered with their academic performance. The fourth group, *financially stressed, high impact*, contained students who indicated support for all financial stress questions including not participating in activities, not purchasing required

academic materials, and investigating dropping out due to costs, and believed that financial concerns impacted their academic performance. The analyses also identified a fifth group, *not financially stressed*, comprised of students who did not worry about paying for college and having enough money for their regular expenses.

While the above research suggests that financial stress is common among undergraduates, little research has investigated how it impacts students. The results of two studies suggest that students under financial stress are more likely to also suffer from depression, anxiety, or suicidal thoughts (Eisenberg, Gollust, Golberstein, & Hefner, 2007; McPherson, 2012). While others have associated financial difficulties among college students to their self-esteem related to their physical appearance (Crocker & Luhtanen, 2003). Financial stress may also lower academic performance (Ross, Cleland, & Macleod, 2006).

Money and College Student Outcomes

While limited research on the impacts of financial stress exists, economists have much research demonstrating the role money plays in educational decisions and outcomes. Becker demonstrated how the accumulation of education and skills results in higher earnings and thus demand for a college degree (Becker, 1993). Student aid, whether directly or indirectly provided to students, has been found to influence college enrollment and choice (Dynarski, 2000, 2003; Leslie & Brinkman, 1987; Long, 2004). Financial aid also promotes persistence (Leslie & Brinkman, 1987). Financial barriers, such as unmet need, have been correlated with dropping out, particularly among low income students (Paulsen & St. John, 2002). Additionally, replacing loans with scholarships has substantial impacts on persistence (DesJardins, Ahlburg, & McCall, 2002). Simulations suggest that the magnitude of the effect is so large compared to need-based grants that students perceived that scholarships have a value beyond their monetary value.

Expected future earnings also appear to be an essential component of the major choice process (Montmarquette, Cannings, & Mahseredjian, 2002).

Theory

Psychology theories on stress guided this study. Stress is an individual's reaction to an external demand or the absence of means (Seyle, 1956, 1974). This reaction occurs through the interaction of a stressor, an external demand, and an individual's situation (Smith, 1987). Stressors take various forms from minor inconveniences to life changing events and can have both positive and negative consequences.

Coping occurs when an individual reacts to stress and is expressed through both behavioral and mental processes (Folkman, 1984; Folkman & Lazarus, 1980). It also can have either beneficial or harmful effects on individuals. How an individual reacts to stress is referred to as a coping strategy and can vary both between and within individuals. Coping strategies generally fall into two groups: problem- and emotion-focused coping (Folkman & Lazarus, 1980). When an individual uses a problem-focused coping style, they attempt to alter their relationship with a stressor. For example, a student stressed by a poor grade on a midterm exam may cope by spending more time studying for a final. An emotion-focused coping strategy seeks to reduce the emotional reactions caused by a stressor. Another student stressed by a poor grade may also try to distract themselves from their academic problems by playing video games, demonstrating an emotion-focused coping strategy.

Financial stress is "the unpleasant feeling that one is unable to meet financial demands, afford the necessities of life, and have sufficient funds to make ends meet" (Davis & Manter, 2004, p. 4). For students, financial demands could include tuition or loan payments or the desire to go on an expensive spring break trip. Since a lack of money causes financial stress, a

problem-focused coping strategy requires students to increase their money supply or reduce their expenses. Common forms of obtaining additional money include working more or taking out additional student loans. Students may also reduce their expenses by a variety of ways such as transferring to a lower cost college or eating out less. Students who pursue an emotion-based strategy would attempt to distract themselves their money problems by watching more TV or studying more.

Research Questions

Guided by the theory above, we investigated the following questions:

1. How does experiencing financial stress influence student engagement among first-year students?

2. How does the influence of financial stress on student engagement vary by coping strategy?

Methodology

Sample

We utilized data from the 2012 administration of the National Survey of Student Engagement (NSSE) to answer these questions. During this survey administration, students attending 43 institutions were asked to fill out a supplemental questionnaire related to their financial stress in addition to the core NSSE instrument. We used the responses of just first-year students younger than 23. We limited the sample to these students because we lacked parental income data for older students, a key variable related to financial stress. Moreover, this exclusion has the advantage of focusing on young students typically managing their finances for the first time. After also excluding students who failed to respond to any of the financial stress items, our dataset included 5,490 students.

Table 1 contains the characteristics of the sample. Nearly all students took at least one course on campus and were enrolled full-time. Approximately two-thirds of the students were female and about 70 percent were White. 57 percent of the students had a parent who earned at least a bachelor's degree and the sample had a wide distribution of parental incomes. About 40 percent of students attended institutions granting master's degrees, a quarter were enrolled at baccalaureate colleges, and a third attended doctorate-granting institutions. The percentage of students attending public and private institutions were roughly equal. About 43 percent of the sample were enrolled at institutions serving fewer than 2,500 undergraduates, while 36 attended institutions with an undergraduate enrollment of 10,000 or more.

Variables

The outcomes of interest were the five NSSE Benchmarks: Level of Academic Challenge (LAC), Active and Collaborative Learning (ACL), Student-Faculty Interaction (SFI), Enriching Educational Experiences (EEE), and Supportive Campus Environment (SCE). Information on the reliability and validity of the NSSE Benchmarks is available from NSSE's (2012b) psychometric portfolio. In keeping with NSSE practices, all of the benchmarks were placed on a 0-100 scale. We also focused our analyses on students' financial stress coping strategy. This variable was estimated using latent class analysis (LCA) (see Appendix A for the results of this analysis) by a previous study[2] (Fosnacht, 2013). This analysis identified five latent groups by analyzing students' responses to eight survey items inquiring about how finances impact their college experiences. The groups, described in the literature review above, represent four financial stress coping strategies, the *no*, low, *medium*, and *high impact* groups, and a *not financially stressed* group.

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[2] Unlike the current study, this analysis did not remove students older than 23.

We also utilized data on a variety of student and institutional characteristics. The student characteristics included gender, part-time enrollment, race or ethnicity, age, distance education, parental education and income, and SAT score (Verbal + Math or ACT equivalent). We also used data on the following institutional characteristics: aggregated 2010 Basic Carnegie Classification, undergraduate enrollment, and institutional control.

Analyses

We began our analyses by using multiple imputation to impute missing data. This procedure allowed us to reduce bias due to missing data (Allison, 2002). It also allowed us to use multiple pseudo-class draws (as opposed to maximum probability assignment) when assigning financial stress coping strategy group membership. This procedure let us account for the uncertainty of latent class membership (Bandeen-roche, Miglioretti, Zeger, & Rathouz, 1997). A total of 20 imputed data sets were created using imputation via chained equations. For each of the 20 data sets, latent class membership of the financial stress coping strategy variable was randomly assigned using each student's posterior probability distribution.

Due to the nesting of students within institutions, we used multilevel modeling with a random intercept to estimate all models. We began by estimating one-way random effects ANOVA models for all five benchmarks (Model 1). These models provided the overall population means and estimates for the between- and within-subject standard deviations (SDs). We also used the between- and within-subject SDs to calculate intraclass correlation coefficients (ICC). Next, we estimated linear random-intercept models that included four dummy variables representing financial stress coping strategies compared to students in the *not financially stressed* group (Model 2). We also used the SD estimates to calculate the residual ICCs and used the coefficient estimates to calculate the effect size of the group differences by dividing the

coefficients by the pooled SDs. Finally, we extended the random-intercept models by adding a variety of student and institutional characteristics (Model 3). For all of the random intercept models, student-level variables were group mean centered and institution level variables were grand mean centered.

Results

Table 2 contains results for Models 1 and 2. The top pane displays the results for the one-way random effects ANOVA models (Model 1). The intercepts display the estimates for the overall sample mean for the five benchmarks. These estimates were similar to the results for the full 2012 U.S. NSSE first-year student sample (National Survey of Student Engagement, 2012a). The ICCs were all about .20, indicating that student engagement varies between institutions.

The bottom pane of Table 2 presents the estimates for the first set of random intercept models (Model 2) and compares how engagement varied by financial stress coping strategy. Students in the financially stressed, *low, medium*, and *high* groups reported experiencing higher levels of academic challenge than *not financially stressed* students on average. The effect size of these differences ranged between .14 and .20 SDs. However, the estimate for the financially stressed, *no impact* group was higher, but not statistically different from the *not financially stressed* group. The results for ACL, SFI, and EEE were similar. The *medium* and *high impact* groups had higher scores on all three benchmarks. The effect size for the *medium impact* compared to the *not financially stressed* group on the three benchmarks was .17 SDs. The effect sizes of the difference for the *high impact* group were larger at .28, .30, .23 for ACL, SFI, and EEE, respectively. The coefficients for the *no* and *low impact* groups were positive on these measures, but not significant at $p < .05$. In contrast to the other benchmarks, students who experienced financial stress perceived a less supportive campus environment than *not financially*

stressed students, as all of the estimates were negative. The differences for the *low*, *medium* and *high impact* groups were significant and had effect sizes of -.12, -.22, -.31, respectively.

Table 3 contains the results for the random intercept models with the additional covariates (Model 3). After holding other characteristics constant, the relationships between financial stress coping strategy and the benchmarks were relatively unchanged from the results in Model 2. However, we did observe some exceptions. For SFI, the effect size of the difference between the *high impact* and *not financially stressed* groups declined from .30 to .27 SDs. The difference between the *no impact* and *not financially stressed* groups on EEE became statistically significant after controlling for students' characteristics; however, the magnitude of the estimated difference is roughly the same (.07 vs. .08). In contrast, the magnitude of the differences on EEE increased for the *medium* and *high impact* groups to .20 and .27 SDs, respectively. The most changes occurred for the SCE model. The estimated coefficients increased for all four financial stress groups on SCE. Additionally, the difference between the *no impact* and *not financially stressed* groups was significant at p < .05.

The results also indicate that other student characteristics were correlated with undergraduates' engagement. Students who had a parent that earned a graduate degree had higher LAC, ACL, SFI, and EEE scores than students with a bachelor's parental education level, holding other characteristics constant. Students that selected the "unknown" parental income option on average had lower LAC, ACL, and EEE scores than students' with a parental income of $100,000 or higher, controlling for other factors. Hispanic/Latino and multi-racial students reported experiencing more ACL activities than White students, holding constant other characteristics. Furthermore, Black, Asian, Hispanic/Latino, Foreign, and multi-racial students on average had more enriching experiences than similar White students. On average, females

reported experiencing more academic challenge than males, controlling for other variables. SAT scores negatively correlated with SFI, but positively correlated to EEE, holding other characteristics constant. Finally, part-time students on average had higher ACL, SFI, EEE, and SCE scores than full-time students.

The institution characteristics included in the analyses were only significantly correlated with SCE. Students who attended doctoral- or master's-granting institutions reported experiencing a less supportive campus environment than students enrolled at bachelor's institution, holding other characteristics constant. Additionally, private institutions on average had higher SCE scores than public institutions. Undergraduate enrollment was not correlated with any of the benchmarks. Additionally, the between-institution SD estimates and residual ICCs indicate that other latent institutional characteristics were correlated with the NSSE benchmarks.

Discussion

Financing a college education has become more difficult for students. Wages have not kept pace with the cost of college (Baum & Ma, 2012), limiting parents' ability to help pay for their child's education. Additionally, many states have reduced the subsidies provided to students (Kane et al., 2003). Consequently, students have been forced to assume an increasing share of college costs. They frequently take out large loans and have substantial unmet need. Coping with financial stress has become a new rite of passage for many college students today.

Economists have long demonstrated that money influences college going and choice, persistence, and major choices (Becker, 1993; DesJardins et al., 2002; Leslie & Brinkman, 1987; Long, 2004; Montmarquette et al., 2002). However, they have largely neglected to investigate how financial pressures influence the college experience. In this study, we examined how

financial stress impacts students' engagement during their first year. We compared the outcomes of four different financial stress coping strategies used by students to peers not experiencing financial stress. The results clearly indicate that financial stress impacts student behavior and perceptions. Students who evidenced financial stress reported experiencing a more academically challenging curriculum, participating in more active and collaborative learning activities, interacting more frequently with faculty, and engaging in more enriching educational experiences in and out-side of the classroom. However, they also perceived a less supportive campus environment than their peers who did not experience financial stress.

The results indicate that financial stress has its strongest impacts on engagement among students in the *financially stressed medium* and *high impact* groups. The *medium impact* group contained students who frequently did not participate in activities due to a lack of money and investigate borrowing more and believed that financial concerns impacted their academic performance. These actions indicate that members of this group used a problem-focused coping strategy to deal with their financial stress through reducing their expenses and increasing their income. The estimated absolute magnitude of the differences between the *medium impact* and *not financially stressed* students ranged between .16 and .26 SDs, holding constant other factors. NSSE (n.d.) recommends classifying differences below .10 as trivial, between .10 and .29 as small, .30 to .49 as medium, and above .50 as large or very large. Consequently, the benchmark differences for the *medium impact* group should be viewed as small, but not trivial. Yet, these small observed differences occur over a wide domain of activities, cumulatively suggesting that financial stress substantially alters students' behaviors and perceptions.

For all outcomes, the *high impact* group exhibited the largest differences relative to the *not financially stressed* group. The *high impact* group can be identified by their investigation of

dropping out and decision to not purchase required academic materials due to costs. These

choices indicate that members of this group faced substantial liquidity constraints. In other

words, these students had extreme difficulty obtaining the money necessary to pay for the cost of

attending college and their living expenses. Their difficulties have risen to the point where they

have considered dropping out, despite the substantial earnings premium associated with a college

degree (Becker, 1993). The effect sizes for the *high impact* group compared to the *not financially*

stressed group were in the small to medium range. Like the *medium impact* group, financial

stress appears to impact a variety of activities and accumulate into substantial differences.

The results indicate that financial stress had a smaller impact on the engagement of

students in the *low impact* group. The *low impact* group reacted to their financial stress by

attempting to find additional work or borrow more money, a problem-focused coping strategy.

Significant differences between the *low impact* and *not financially stressed* groups were

observed on LAC and SCE and both effects could be classified as small. The *low impact* group

had differences that would be classified as small, but not trivial by NSSE on SFI and EEE, but

were not statistically significant at p < .05. These divergent findings most likely occurred

because the *low impact* group contained the fewest amount of students of the five groups and

lacks the power of the other groups, particularly after adjusting standard errors to account for the

nesting of students and the use of multiple imputation.

The final financial stress coping strategy we examined was the *no impact* group. These

students indicated they were financially stressed, but the stress did not appear to impact their

behavior. Therefore, this group utilized an emotion-focused coping strategy to deal with their

financial stress. For the *no impact* group, the only effect size greater than .10 occurred for SCE,

but the other differences appear to be trivial compared to *not financially stressed students*.

Students who employed a problem-based financial stress coping strategy (the *low*, *medium*, and *high impact* groups) appear to experience a more academically challenging environment by taking harder courses and/or exerting more effort on their academic work. The same students also appear to be more frequently participating inside the classroom, more likely to collaborate with others outside of the classroom, more frequently interact with faculty, and engage in more enriching educational activities. This suggests that students who experience liquidity constraints and need to work or borrow more to finance their education react by wanting to be more invested in their education.

Despite putting forth more effort into their education, first-year students who experienced financial stress clearly perceived a less supportive campus environment than students not experiencing financial stress. Financially stressed students believed that their institution did less to help them succeed academically and socially or believed they had lower quality relationships with people at their institution. Unfortunately, the results do not indicate why or how these perceptions develop. Various theories predict that students who are more involved and invested in their education would also believe that their institutions are supportive and committed to their success (Astin, 1984; Kuh, Schuh, Whitt, & Associates, 1991; Tinto, 1993). The higher levels of engagement by financially stressed students suggest that these actions were not negative, as we would expect less engagement in this scenario. Therefore, the most likely explanation for this finding is that financial stress may cause the student to feel that they are not valued by the institution. This interpretation is supported by previous research that scholarships have an outsized effect on persistence, given their simple monetary value (DesJardins et al., 2002). Scholarships may signal to students that they are wanted and valued by the institution, while unmet need and high tuition bills may send the opposite signal.

Not feeling valued by institutions may have long-term implications for institutions. First, SCE is correlated with first-year persistence and graduation rates (Pike, 2013). Therefore, financially stressed students should be expected to have lower persistence rates than students who do not experience financial stress. This will also be a barrier to meeting policymakers' goals to increase the nation's educational attainment rate. Additionally, if substantial numbers of students experience financial stress and do not feel valued by their institutions throughout their baccalaureate careers, as alumni, they may be less likely to donate money to the institutions in the future.

The positive correlation between financial stress and student engagement, except for SCE, suggests that additional financial stress would be beneficial for students. In practical terms, it suggests that institutions and the government should provide less financial aid. However, implementing this scenario could have substantial unintended consequences. First, students are clearly sensitive to college costs and substantial reductions in aid would most likely depress the nation's college enrollment and graduation rate (Leslie & Brinkman, 1987). Decreased college access and educational attainment would harm the nation's economy (Goldin & Katz, 2008) and deprive it of many public goods (Chambers, 2005). Second, students face credit constraints and have limited ability to borrow outside of government loan programs (Becker, 1993; Belley & Lochner, 2007). Therefore, many students would be unable to obtain adequate funds to pay for college if their share of college costs is increased dramatically.

While the above findings conform to theory, they should be interpreted with caution. First, the relationships described above are correlational, not causal. Theory on stress also posits that reactions to stress vary with and between individuals. Therefore, generalizing the results to other time points should be done with caution. Additionally, the key variable in this study,

financial stress coping strategy, was a latent or unobserved characteristic expressed in

probabilities. We assigned this variable to students using multiple pseudo-class draws to account

for the uncertainty of class assignment; however, our results may be biased in some unknown

way. We were also unable to investigate if the relationship between financial stress and student

engagement varied between institutions. We attempted to model some of our analyses using

random coefficient models; however, these models proved too complex to estimate most likely

due to the use of multiple imputation.

Finally, research on financial stress among undergraduates is rather limited and presents

many opportunities for future research. Financial stress is not a fixed student characteristic and

may ebb and flow over time. Therefore, a longitudinal analysis of financial stress would help

establish its prevalence among students. A natural extension of this study would be to investigate

how financial stress impacts outcomes such as persistence and graduation. Other research

possibilities include investigating how financial stress changes after receipt of various forms of

new money and how financial stress interacts with other sources of stress (e.g., academic,

medical, unanticipated events) among students.

Conclusion

Due to the increasing financial pressures absorbed by undergraduates, understanding how

financial stress impacts their college experiences is imperative. This study uniquely investigated

how various coping strategies for financial stress influenced first-year students' behaviors and

perceptions. Our findings indicated that students who experienced financial stress more

frequently engaged in a variety of beneficial educational activities than students who did not

experience financial stress. However, financially stressed students perceived a less supportive

campus environment. Our results also demonstrated that the magnitude of financial stress'

impact on students varies by the coping strategy utilized by students. The results in combination suggest that financial stress is a multifaceted phenomenon that impacts a diverse range of behaviors and perceptions. While our findings provide initial insights into the effects of financial stress, more research needs to examine this growing problem.

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Table 1.
Descriptive statistics of the sample (*n* = 5,490)

	Percentage
Student Characteristics	
Financial stress coping strategy	
Not financially stressed	31
Financially stressed, no impact	23
Financially stressed, low impact	11
Financially stressed, medium impact	20
Financially stressed, high impact	15
Age	
Less than 20	89
20 - 23	11
Distance learning	
Online students	1
On-campus students	99
Gender	
Female	66
Male	34
Enrollment status	
Part-time	3
Full-time	97
Parental education	
High school or less	17
Some college/Assoc.	27
BA	30
Graduate degree	27
Parental income	
Less than $35,000	21
$35,000 - 64,999	25
$65,000 - 99,999	18
$100,000 or more	14
Don't know	21

Table 1 Continued

	Percentage
Race/ethnicity	
African American/Black	9
American Indian/Alaska Native	< 1
Asian/Pacific Islander	3
Caucasian/White	69
Hispanic	8
Other/Unknown	6
Foreign	3
Multi-racial/ethnic	2
SAT score	
Less than 800	5
800-999	32
1,000-1,199	39
1,200-1,399	20
1,400-1,600	4
Institutional Characteristics	
Basic 2010 Carnegie Classification (aggregated)	
Doctorate-granting universities	32
Master's colleges and universities	42
Baccalaureate colleges	26
All others or unclassified	< 1
Control	
Public	52
Private	48
Undergraduate enrollment	
Fewer than 2,500	43
2,500-4,999	4
5,000-9,999	17
10,000 or more	36

Table 2
One-way random effects ANOVA and financial stress only random intercept models (n=5,490)

	Level of Academic Challenge		Active and Collaborative Learning		Student-Faculty Interaction		Enriching Educational Experiences		Supportive Campus Environment	
	Coef.	ES	Coef.	ES	Coef.	ES	Coef.	ES	Coef.	ES
Model 1										
Fixed effect										
Intercept	54.70 ***		45.91 ***		37.8 ***		28.67 ***		66.31 ***	
Random effects										
$\sqrt{\psi}$	3.22		3.95		3.56		3.68		4.98	
$\sqrt{\theta}$	12.72		16.22		18.05		13.16		18.38	
ICC	.20		.20		.16		.22		.21	
Model 2										
Fixed effects										
Financial stress coping strategy group (Not financially stressed omitted)										
No impact	.87	.07	1.25	.08	.94	.05	.90	.07	-1.62	-.09
Low impact	1.77 *	.14	1.08	.07	1.82	.11	1.10	.09	-2.15 *	-.12
Medium impact	2.29 ***	.18	2.71 ***	.17	3.07 ***	.17	2.31 ***	.17	-4.05 ***	-.22
High impact	2.64 ***	.20	4.64 ***	.28	5.41 ***	.30	3.22 ***	.23	-5.93 ***	-.31
Intercept	54.70 ***		45.91 ***		37.80 ***		28.67 ***		66.31 ***	
Random effects										
$\sqrt{\psi}$	3.22		3.96		3.57		3.68		4.99	
$\sqrt{\theta}$	12.68		16.15		17.96		13.12		18.27	
Residual ICC	0.20		0.20		0.17		0.22		0.21	

* p < .05, ** p < .01, *** p < .001
Notes: ES = Effect size calculated using Cohen's *d*

Table 3
Full random intercept models (n=5,490)

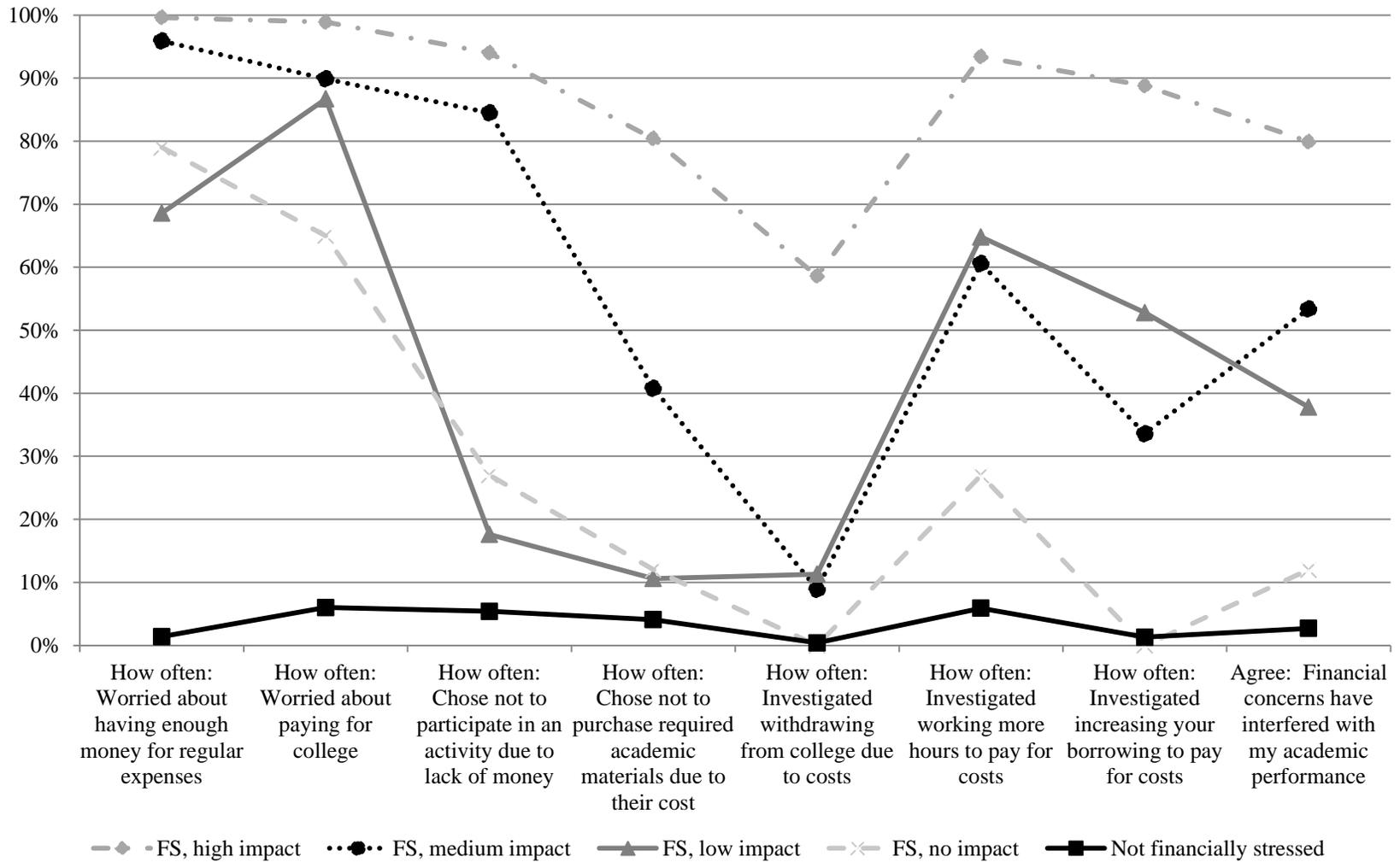|	Level of Academic Challenge		Active and Collaborative Learning		Student-Faculty Interaction		Enriching Educational Experiences		Supportive Campus Environment	
	Coef.	ES	Coef.	ES	Coef.	ES	Coef.	ES	Coef.	ES
Fixed effects										
Financial stress coping strategy group (Not financially stressed omitted)										
No impact	.84	.07	1.40	.09	.93	.05	1.11*	.08	-2.03*	-.11
Low impact	1.66*	.13	1.21	.08	1.77	.10	1.44	.11	-2.73*	-.15
Medium impact	2.19***	.17	2.86***	.18	2.90***	.16	2.70***	.20	-4.73***	-.26
High impact	2.56***	.20	4.80***	.29	4.99***	.27	3.74***	.27	-6.81***	-.36
Aged 20-23	-.10		.78		.94		.18		-.82	
Distance learners	1.35		-4.18		-1.31		1.42		.95	
Female	2.07***		-.36		-.35		.19		.55	
Parental education (Bachelor's omitted)										
High school or less	.48		.90		.04		-.53		1.55	
Some college/Assoc.	.58		.00		.38		-.51		.31	
Graduate degree	.94*		1.97***		2.59***		1.64***		-.07	
Parental income ($100,000 or more omitted)										
Less than $35,000	-.61		-.51		.56		.23		1.09	
$35,000 - 64,999	-.72		-.05		-.37		-.30		.65	
$65,000-$99,999	-1.10		-.49		-.40		-.08		.80	
Unknown	-1.94**		-2.30*		-1.62		-1.53*		-1.27	
Part-time	1.57		4.41**		4.38**		4.40***		3.58*	
Race/ethnicity (White omitted)										
Black	-.18		.73		1.75		1.82*		1.25	
Native American	-.11		-3.32		-1.99		1.48		-3.93	
Asian	-.12		.55		2.54		2.52*		2.93	
Hispanic/Latino	.96		2.10*		1.15		3.10***		1.45	
Other/Unknown	-.05		-1.41		-1.35		1.13		-.11	
Foreign	1.79		1.49		1.65		2.70*		1.27	
Multi-racial	1.80		3.18*		-.31		3.80**		1.38	
SAT I (100s)	.04		.28		-.60**		.69***		-.35	

Table 3 Continued

	Level of Academic Challenge		Active and Collaborative Learning		Student-Faculty Interaction		Enriching Educational Experiences		Supportive Campus Environment	
	Coef.	ES	Coef.	ES	Coef.	ES	Coef.	ES	Coef.	ES
Carnegie Classification (Bachelor's omitted)										
Doctoral	-1.65		-.25		-.58		.18		-5.78 *	
Master's	-1.73		-2.70		-1.55		-2.67		-3.46 *	
Other	3.02		8.11		-4.30		-7.36		-2.86	
Private institution	1.38		1.22		3.30		2.79		5.19 **	
UG enrollment (1000s)	-.03		-.12		.08		.07		.13	
Intercept	54.14 ***		45.30 ***		37.51 ***		28.62 ***		65.01 ***	
Random effects										
$\sqrt{\psi}$	3.10		3.65		3.50		3.37		3.83	
$\sqrt{\theta}$	12.63		16.07		17.90		13.00		18.23	
Residual ICC	.20		.18		.16		.21		.17	

* $p < .05$, ** $p < .01$, *** $p < .001$
Notes: ES = Effect size calculated using Cohen's *d*

Appendix A
Mean item-response probabilities of the financial stress items by latent class

Note: FS = Financially stressed