The Relationship Between Financial Strain, Perceived Stress, Psychological Symptoms, and Academic and Social Integration in Undergraduate Students

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Abstract

Objective—Financial strain may directly or indirectly (i.e., through perceived stress) impact students' psychological symptoms and academic and social integration, yet few studies have tested these relationships. We explored the mediating effect of perceived stress on the relationship between financial strain and two important outcomes: psychological symptomology and academic and social integration.

Participants—Participants were 157 undergraduate students. Data were collected from December 2013 to March 2014.

Methods—Cross-sectional data collection conducted using online survey software.

Results—We found that perceived stress mediated the relationship between financial strain and (a) psychological symptomology and (b) academic and social integration. Both models included first-generation status as a covariate.

Conclusions—Results suggest that perceived stress is an important intervention target for reducing psychological symptoms and improving academic and social integration for undergraduate students. Implications for university health centers and mental health professionals include incorporating a public health model to minimize stress risk.

Keywords

Perceived Stress; Social Integration; Academic Integration; Mental Health; Financial Strain; First-generation Student; Low-Income Student

Introduction

A college education is critical to economic success and upward social mobility in America. This is especially important for low-income (i.e., young adults whose families fall below the federal poverty line) and/or first-generation (i.e., young adults whose parents have not

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earned a four year college or university degree) students.[1,2] These individuals have the most to gain from attaining a college degree, as returns on investment for them are at least as high (if not higher) compared to students with average socioeconomic status.[3] Children born into the bottom income quartile who attain a college degree quadruple their chances of making it into the top quartile, and increase their chances of making it out of the bottom quartile by 50%.[4] Unfortunately, college completion rates for low-income and/or first-generation students are very low. Just one in ten low-income and/or first-generation students will have a college degree by age 25, vs. one in two for their non-low-income and/or non-first-generation peers.[2] This is not due to a lack of enrollment in post-secondary education. In fact, low-income and/or first-generation students make up 24% of the undergraduate student population, a percentage that is increasing steadily.[2] This enrollment-to-graduation gap may be due to greater financial and non-financial strain faced by low-income and/or first-generation students in postsecondary education, resulting in poorer graduation rates.[2] While first-generation students do not always come from low-income families, and low-income students are not always first-generation students, often the two groups converge, creating two dimensions of disadvantage that have negative associations with degree attainment.[5–7] Given the benefits associated with degree completion, it is essential to understand the primary mechanism causing the large enrollment-to-graduation gap and poor academic outcomes of low-income and/or first-generation students.

Financial Strain

One of the most robust stressors for low-income and/or first-generation students is financial strain, defined as perceived economic stress and lack of economic support. Past research has identified a strong relationship between financial strain and probability of graduation.[8,9] Specifically, students reported that four out of the five top stressors in their lives involved personal finances, and that these stressors affected their academic progress and performance.[10] Further, unmet financial needs may require low-income and/or first-generation students to work full time jobs and live off campus, which may hinder their academic and social interaction on campus as well as increase the probability for attrition.[11]

Perceived Stress

Perceived stress is defined as the extent to which an individual perceives that their demands exceed their ability to cope, and is a major factor in academic disruption and poor academic performance.[12,13]

Academic and Social Integration

Low-income and/or first-generation students are more likely to experience difficulty with academic and social integration, defined as student's involvement and adaptation to their university (e.g., the ability to make social connections with peers and/or faculty on campus, meeting academic demands, participating in on-campus clubs or activities, and having clear career direction).[14] Difficulties with academic and social integration can be expressed in a variety of ways in low-income and/or first-generation students. For example, first-generation students are less likely to socialize with faculty or students outside of the classroom, less likely to develop close friendships with other students, and less likely to participate in extracurricular activities (academic or social clubs) on campus.[2,14] Difficulties with

academic and social integration among low-income and/or first-generation students is scantly studied.

Psychological Symptomology

Mental health problems have been identified as a critical public health issue on college campuses by the American Psychological Association.[15–17] Mental health issues are prevalent on college campuses, can be detrimental to overall academic performance and success, and frequently lead to student attrition.[15] In addition, mental health issues are linked to suicidal ideation, a growing public health concern, specifically on college campuses.[18] Mental health issues may be exacerbated for low-income and/or first-generation students due to the negative impact that financial strain has on perceived stress.[19]

Theoretical Framework

We theorize that the constructs of interest (i.e., financial strain, perceived stress, psychological symptoms, and academic and social integration) are related to one another (see Figure 1). Perceived stress and financial strain have a negative impact on students' well-being, specifically their mental health.[20–22] For example, research suggests that financial strain and its sequelae (e.g., insufficient food, shelter, heat, inability to pay bills) are critical factors in negative psychosocial outcomes such as stress and depression in students.[23,24] Finally, financial strain and perceived stress have been related to difficulty with academic and social integration as students who experience financial strain may be less likely to engage in campus activities potentially due to financial barriers.[2] Increased perceived stress may also exacerbate already present difficulties with academic and social integration that low-income and/or first-generation students face.

Given that past studies have indicated the importance of perceived stress on low-income and/or first-generation students' outcomes, we were interested in testing the theory that perceived stress may be the primary mediating mechanism between financial strain, psychological symptomology, and academic and social integration.[20–22] Possible direct and indirect effects (e.g., increased perceived stress levels) of financial strain on students' academic and social integration levels have been seldom studied, and have not been studied using a mediational model to date. While past studies have established a strong correlational relationship between financial strain and psychological symptoms in undergraduate students, a solid understanding of the potential mediating mechanisms for this relationship has not yet been established.[20] Therefore, the mechanism through which financial strain impacts poor outcomes is especially important to understand, as early identification may be the best way to prevent negative sequelae, potentially boosting the capacity for first-generation and low-income students to improve their academic performance and enhance their mental health and well-being.

The current study utilized a cross-sectional survey methodology with a sample of university undergraduates to examine the relationships among financial strain, perceived stress, psychological symptoms, and academic and social integration at college. We tested two primary hypotheses: (1) Perceived stress was expected to mediate the relationship between financial strain and psychological symptoms, and (2) Perceived stress was expected to

mediate the relationship between financial strain and academic and social integration. Both models included first-generation status as a covariate given our interest in this particular sub-group of undergraduate students.

Method

Procedure

After approval by the university Institutional Review Board, participants were recruited primarily through undergraduate psychology courses. Participants were also recruited through Student Support Services, a university office at that works with identified low-income, first-generation, and disabled students, and the university's honors program. Inclusion criteria included being an undergraduate student at the university; there were no exclusion criteria. The survey was administered using Qualtrics, an online survey software system, and required an average of ten minutes to complete. Consent was obtained prior to participation via an online description of the study and the option to participate or leave the study.

Instruments

Demographics—Basic demographics were collected using an investigator-created measure. These demographics included job status, hours worked per week, family income level, the number of individuals who lived off this income, and enrollment status in university, i.e., part-time (less than twelve credits) or full-time (twelve or more credits) in university.

Financial Strain—The Financial Strain and Economic Support Measure (FSESM);[25] only the chronic financial strain subscale was used to measure this construct. Financial strain was assessed with three indicators that asked whether study participants have enough money to live on each month, whether they have sufficient spending money, and how their financial situation compares to that of other people their own age. These items include, "Does your family have enough for daily living expenses each month?" "Compared to other people your own age, how do you feel about your financial situation?" and "Do you have enough pocket money to spend?" Participants were asked to rate items on a four point scale, ranging from 1 (*Plenty)* to 4 (*Extremely tight*), a three point scale ranging from 1 (*Better*) to 3 (*Worse*), or a 2-point scale ranging from 2 (*No*) to 1 (*Yes*), depending on the question asked. Previously reported reliability is strong for the financial subscale (Cronbach's alpha = .73).[25] Cronbach's alpha in the present investigation was .74.

Perceived Stress—The Perceived Stress Scale (PSS),[13] a brief ten item measure, was used to assess the degree to which situations in one's life are appraised as stressful. Sample items include, "In the last month, how often have you found that you could not cope with all the things that you had to do?" and "In the last month, how often have you been able to control irritations in your life?" Participants rated items on a five-point scale, ranging from 0 (*Never*) to 4 (*Very often*). Previously reported reliability is good for this measure (Cronbach's alpha = .85).[13] Cronbach's alpha in the present investigation was .83. PSS scores have displayed convergent validity with other well-known measures, i.e., the State-

Trait Anxiety Inventory (STAI-A factor)[26] and the State-Trait Depression Inventory (STAI-D factor).[27,28]

Academic and Social Integration—The Inventory of College Challenges for Ethnic Minority Students (ICCEMS),[29] a 52 item measure, was used to assess challenges faced by college students across a range of academic and social domains. The following subscales were used in this study: counseling needs (e.g., "Difficulty finding a counselor"), financial worry (e.g., "Worried about family obligations"), academic demands (e.g., "Felt conflict between studying and making friends"), unclear career direction (e.g., "Worried about post-graduation plans"), social isolation, (e.g., "Felt isolated from the college community"), difficulty with academic expression, (e.g., "Felt you could not express yourself adequately in class discussions"), unfamiliarity with campus (e.g., "Had trouble accessing various campus resources"), and inability to study (e.g., "Been unable to study when you wanted to for as long as you wanted to"). These subscales were used for their relevance to the extant literature on academic and social integration in low-income and/or first-generation students.[14] Participants were asked to rate items on a five point scale, ranging from 0 (*Not at all*) to 4 (*All the time*). Previously reported reliability is very good for this measure (Cronbach's alpha = .89).[29] Cronbach's alpha in the present investigation was .91. ICCEMS scale scores have displayed convergent validity with other well known-measures, i.e., the Center for Epidemiologic Studies Depression Scale (CES-D)[30] and the Rosenberg Self-Esteem Scale (RSE).[31]

Psychological Symptomology—The Brief Symptom Inventory (BSI),[32] a 53 item self-report inventory of psychopathology and psychological distress, is used with both clinical and non-clinical populations. The following subscales were used in this study: somatization (SOM; e.g., "Faintness or dizziness"), obsessive-compulsive (OC; e.g., "Having to check and double-check what you do"), interpersonal sensitivity (IS; e.g., "Feeling inferior to others"), depression (DEP; e.g., "Feeling no interest in things"), anxiety (ANX; e.g., "Feeling tense or keyed up"), and phobic anxiety (PHB; e.g., "Feeling uneasy in crowds, such as shopping or at a movie"). Participants were asked to rate each of the items on a five point Likert scale of distress, ranging from 0 (*Not at all*) to 4 (*Extremely*). Cronbach's alpha in the present investigation was .94. BSI scale scores have displayed convergent validity with other well known-measures, i.e., Minnesota Multiphasic Personality Inventory (MMPI)[33] and the Symptom Checklist-90-Revised (SCL-90-R).[34]

Data Analytic Plan

We used descriptive analyses to report demographic characteristics of our sample. To test the two hypotheses in this study, we conducted two separate mediation analyses. Specifically, we tested whether perceived stress, as measured by the PSS,[13] mediated the relationship between financial strain (i.e., FSESM) and (a) psychological symptoms (i.e., BSI) and (b) academic and social integration (i.e., ICCEMS), using first-generation status as a covariate in both models. To test these two mediation analyses, we used the SPSS macro, "PROCESS," based upon the Preacher and Hayes[35] method to produce bootstrap bias corrected and accelerated confidence intervals to evaluate the indirect effect and model coefficients.[35,36]

Mediational modeling attempts to identify the mechanism (M) that underpins a relationship between an independent variable (X) and a dependent variable (Y). Traditional mediational modeling follows the Baron and Kenney approach,[37] which puts forth the following four steps: (1) Does X affect Y? (2) Does X affect M? (3) Does M affect Y while holding X constant? (4) Is the direct effect of X closer to zero than the total effect? This approach is no longer the preferred approach to mediational modeling as it is greatly underpowered.[36] Therefore, the recommended approach to mediation includes the estimation of paths within the model using the bootstrap confidence interval. Bootstrapping allows for empirical estimation of the sampling distribution of the indirect effect (not measured in the Baron and Kenney approach),[37] and produces a confidence interval to be used as part of hypothesis testing. Briefly, this method allows the researcher to treat the sample as a "pseudo population;" randomly sample *n* from that sample with replacement; and estimate the indirect effect in the resample *k* times. Then, the distribution of the indirect effect over multiple resamples is estimated. Bias corrected and accelerated confidence intervals are the preferred method for bootstrapping because they adjust for bias and skewness in the bootstrap distribution.[36] We used biased corrected and accelerated bootstrapping as it adjusts for bias and skewness in the bootstrap distribution.[36] This method is currently the suggested manner to conduct mediational analyses.[38]

Results

Descriptive Statistics and Bivariate Correlations

Table 1 reports descriptive statistics (i.e., means and standard deviations) and bivariate correlations among study variables.

Participants

Participants included 157 undergraduate students from a large Midwestern university, the majority of whom were female (*n* = 112). Ten participants were excluded from the mediational analyses but were included in descriptive analyses as they completed less than half of the survey. The average age of participants was 22 years (*SD* = 6.23). The sample was ethnically diverse, with 63 Caucasians (41.1%), 35 African Americans (22.3%), 35 Hispanic/Latino/Latinas (22.3%), 6 Asians (3.8%), and 18 individuals who were multi-racial or "other" race (11.5%).

Demographics

Participants reported an average GPA of 3.23 (*SD* = .76). The sample included 54 Freshman (34.4%), 41 Sophomores (26.1%), 27 Juniors (17.2%), and 35 Seniors (22.3%). Approximately 51% (*n* = 80) of the participants met criteria for being a first-generation student (i.e., both parents had not completed a four-year college or university degree, or higher). Approximately 38% (*n* = 59) of the participants met criteria for being "low-income," as defined by self-reported family income (measured by asking the participant which total family income bracket they fell into, and how many people lived off this income; low-income status was then determined by the number of those falling below the federal poverty guidelines).[39] Approximately 30% (*n* = 47) of the participants met criteria for being both a low-income and a first-generation student. Approximately 43% (*n* = 68) of the

participants reported having a job, working an average of 20 hours per week ($SD = 3.5$). Students also provided demographic information regarding their maternal and paternal level of education (see Table 2). Participants were primarily (94%) enrolled full-time in university ($n = 147$).

Mediational Model 1

We predicted that perceived stress would mediate the relationship between financial strain (independent variable) and average psychological symptoms (dependent variable; see Figure 2). First-generation status was included as a covariate.

The direct effect of financial strain on psychological symptoms was not significant ($c' = -.0094$, $p = .93$; *95% CI* $= -.21$ to .19). Using a 95% confidence level, boot-strapping with 10,000 iterations produced a bias corrected and accelerated confidence interval of $-.24$ to .19. Zero was not included in this confidence interval, suggesting that the indirect effect (i.e., mediation) was significantly different from zero ($ab' = -.12$; *95% CI* $= -.25$ to $-.01$). The Sobel test corroborated this finding ($Z = -2.07$, $p = .04$), suggesting that Hypothesis 1 was supported.

Mediational Model 2

We also predicted that perceived stress would mediate the relationship between financial strain (independent variable) and academic and social integration (dependent variable; see Figure 3). First-generation status was included as a covariate.

The direct effect of financial strain on academic and social integration was not significant ($c' = -.0057$, $p = .58$; *95% CI* $= -.26$ to .14). Using a 95% confidence level, boot-strapping with 10,000 iterations produced a bias corrected and accelerated confidence interval of $-.25$ to .01. Zero was not included in this confidence interval, suggesting that the indirect effect (i.e., mediation) was significantly different from zero ($ab' = -.12$; *95% CI* $= -.25$ to $-.01$). The Sobel test corroborated this finding ($Z = -2.07$, $p = .04$), suggesting that Hypothesis 2 was supported.

Comment

The findings from the current study provide insight on the relationships between financial strain, psychological symptoms, and academic and social integration in undergraduate students enrolled in post-secondary education. Taken together, these two mediational models suggest that perceived stress is an important mechanism to separately explain the relationship between both financial strain and psychological symptoms, and financial strain and academic and social integration. In these models, the influence of perceived stress serves to increase the negative effects of financial strain on psychological symptomology and on academic and social integration. This is new information which can inform interventions to improve psychological and academic outcomes in college students through programming that directly addresses both financial strain and perceived stress.

Programming that addresses financial strain has already been deployed in post-secondary education settings (e.g., Student Support Services; McNair Scholars program, TRiO

programming, Upward Bound), as well as efforts to make financial aid more accessible.[40] Student Support Services and the McNair Scholars program seek to improve graduation rates for these populations and prepare low-income and/or first-generation students for advanced graduate study.[2] These programs provide low-income and/or first-generation students with the opportunity to participate in four to six week long summer programming that prepares students for their transition into college. Other programs offered include: academic, career, and financial aid counseling, direct financial assistance in the form of scholarships, peer assistance, cultural events, workshops, and instructional courses.[41] Students who participated in Student Support Services have higher grades, earn more credits, and have higher retention and graduation rates than low-income and/or first-generation college students who do not participate in these programs.[42]

Research has found that increases in financial aid are directly correlated with retention of first-generation students, while increases in loan debt are directly correlated with the likelihood of attrition.[2,43,44] One study found that combining scholarships with peer advising, organized study groups, and mentoring increases retention, persistence, and degree completion significantly.[45] Another study found that one-on-one student coaching increased retention by 14% after two years of the intervention, and increased graduation rates from 31% to 34% in the subset of students who participated in the study.[46] Colleges and universities must remove financial barriers that prevent low-income and/or first-generation students from fully participating and engaging in experiences that are associated with success in college (e.g., living on campus, participating in extracurricular activities), while also promoting activities that support social and academic success.

While programming around financial strain has been implemented across many colleges, less attention has been paid to perceived stress in undergraduate students. Given the findings of this study that indicate that perceived stress plays an important role in the relationship between financial strain and two negative outcomes (i.e., psychological symptomology and academic and social integration), we suggest that university stakeholders turn their attention to this important issue from a prevention lens (i.e., this is an opportunity to intervene before mental health difficulties or attrition occurs).

Colleges and universities should consider incorporating a three-tiered public health model to minimize universal risk for increased perceived stress by (1) universal capacity building in existing settings for all students; (2) prioritizing high-risk (i.e., low-income and/or first-generation) groups for screening and services to reduce onset and severity of symptoms; and (3) implementing intervention programs for individuals with the highest risk (i.e., low-income and/or first-generation students with identified high levels of perceived stress) to prevent and/or mitigate negative outcomes.[47] One way to address the first tier of universal capacity building in colleges and universities would be to implement free or low-cost campus wide yoga, support groups, or meditation groups that all students are invited to attend. Another option is to enroll first year low-income and/or first-generation students into groups that would support integration, financial counseling, and teaching students coping mechanisms and meditating techniques to prevent perceived stress issues in this population before they begin.

A potential avenue to addressing the second tier, screening high-risk (i.e., low-income and/or first-generation) students, might be through greater coordination between Student Support Services, college and university health centers, and college and university counseling centers. Student Support Services personnel can take steps to learn about enrolled students' perceived stress levels (e.g., by administering the PSS[13] on a routine basis) to screen for students who have high levels of stress. Another existing setting that could offer screenings is college and university health centers, as they are utilized by students of all backgrounds and are therefore an ideal location for a screening. Similar to above, this could begin by having students complete the PSS[13] as they are waiting for their yearly physical and/or shots/immunizations. The provider on staff could use the PSS[13] as a screener to identify students with high levels of perceived stress, and then either refer them to the university counseling center and/or provide the student with resources for how to cope with their elevated perceived stress levels to prevent or reduce psychological symptoms and/or difficulties with academic and social integration.

Given that undergraduate students may face additional barriers to accessing mental health care inside of their university (potentially due to stigmatization around mental health issues and counseling center waitlists)[48] and outside of their university (potentially due to financial constraints, especially for low-income students, and availability of counseling services),[49] it is essential that college and university health centers take it upon themselves to provide interventions students with identified high perceived stress levels in order to reduce these levels. After identifying students with highest levels of perceived stress colleges and universities should invest in low-cost, easy to implement interventions such as the "Maximize Your Potential" intervention, a six-week course that utilizes cognitive behavioral techniques and has been shown to decrease perceived stress scores in students in a randomized controlled trial.[50] Another randomized control trial of a meditation group that teaches various skills (e.g., sitting meditation, mindful or focused attention, patience and slowing down) has been proven to reduce stress among undergraduate students, and could be implemented as an intervention for students in the highest risk group.[51] By doing so, they address the third tier of the public health model, that is, providing interventions for the highest risk students, potentially mitigating the influence of perceived stress on identified negative outcomes (i.e., psychological symptomology and academic and social integration).

Limitations and Future Directions

Because of the cross-sectional nature of this study, causal relationships between financial strain and psychological symptomology/academic and social integration cannot be determined from this investigation. Instead, results document the associations among the variables rather than patterns of cause and effect. Longitudinal and prospective studies are needed to identify causal relationships. A convenience sample was used for this study. The sample was primarily female, and results were gathered only at one Midwestern University, which may reduce the generalizability of this study. We did not verify financial demographics (i.e., the actual amount the student's family earns in a year and how many people are supported). The question was posed to participants, however, college students may not have a thorough understanding of their family's financial situation. Future studies

should utilize Free Application for Federal Student Aid (FASFA) information to gain a more accurate account of students' family's financial situation.

Conclusion

Student attrition and student mental health are increasing concerns at many colleges and universities. Low-income and/or first-generation students are at a higher risk for dropping out, suggesting the importance of understanding factors predicting dropping out as potential targets for intervention. Past research has found both financial strain and mental health issues to be sources of attrition. Prior to this study, the mechanism between financial strain and psychological symptoms/academic and social integration was unknown. This study found that perceived stress mediated the relationship between financial strain and (a) psychological symptoms and (b) academic and social integration. Perceived stress is therefore an important intervention target. University stakeholders, such as college administrators, advisors, support staff, university health center staff, and mental health professionals, should take note of these results in order to improve academic, social, and mental health outcomes for low-income and/or first-generation students. Given the increasing number of low-income and/or first-generation students enrolling, colleges and universities act as promising venue for prevention and intervention of mental health disorders, which can help set young adults on a path to academic, social, and mental well-being.

Acknowledgments

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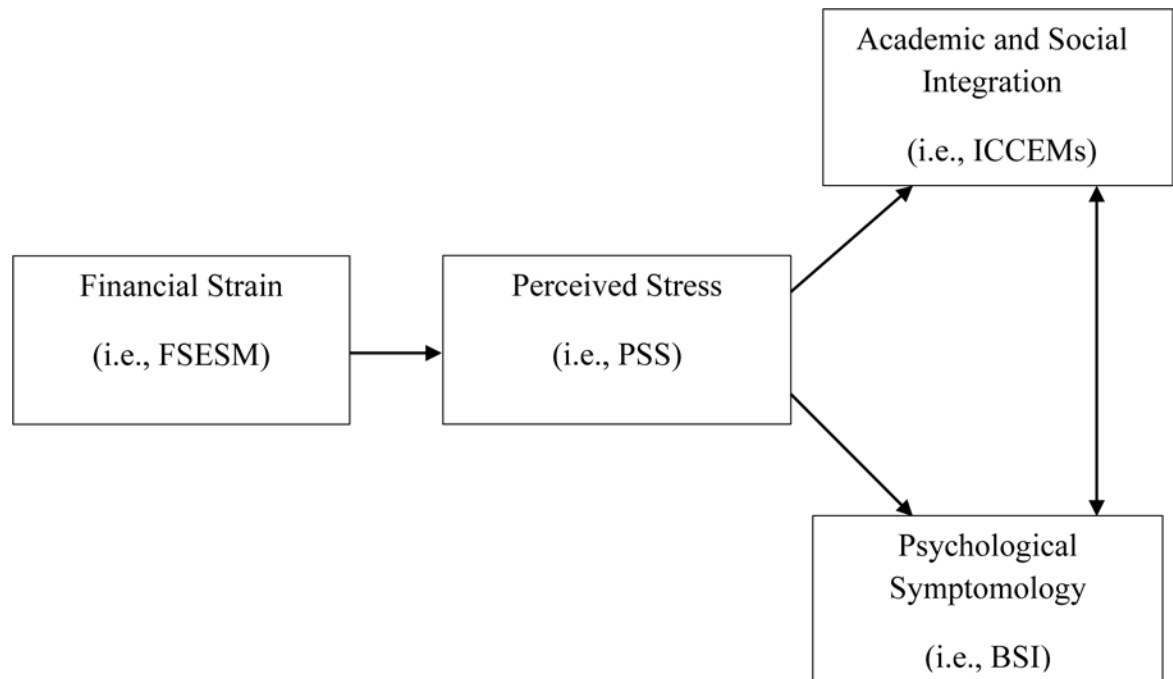
Figure 1.
Model Illustrating how Financial Strain is Hypothesized to be Related to Perceived Stress, Psychological Symptomology, and Academic and Social Integration in Undergraduate Students.
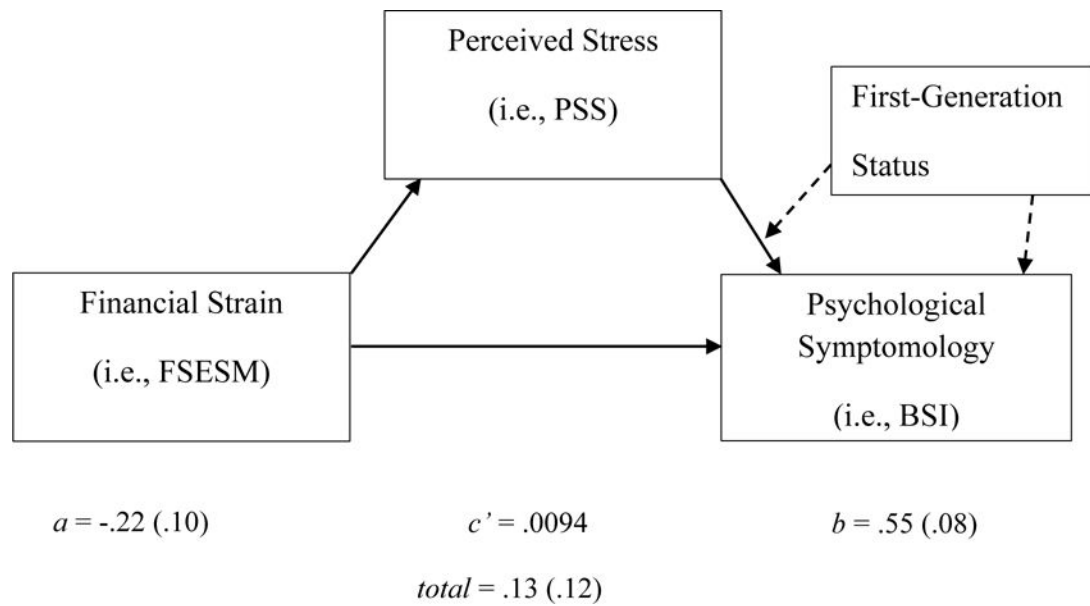
Figure 2.
Model Illustrating how Perceived Stress Mediates the Relationship Between Financial Strain and Psychological Symptomology with First-Generation Status as a Covariate.
Note. All coefficients are standardized and were significant at the $p < .01$ level. Number in parenthesis indicates coefficient standard error. The c' path is the direct effect of the predictor on the dependent variable. The total effect includes the mediator.
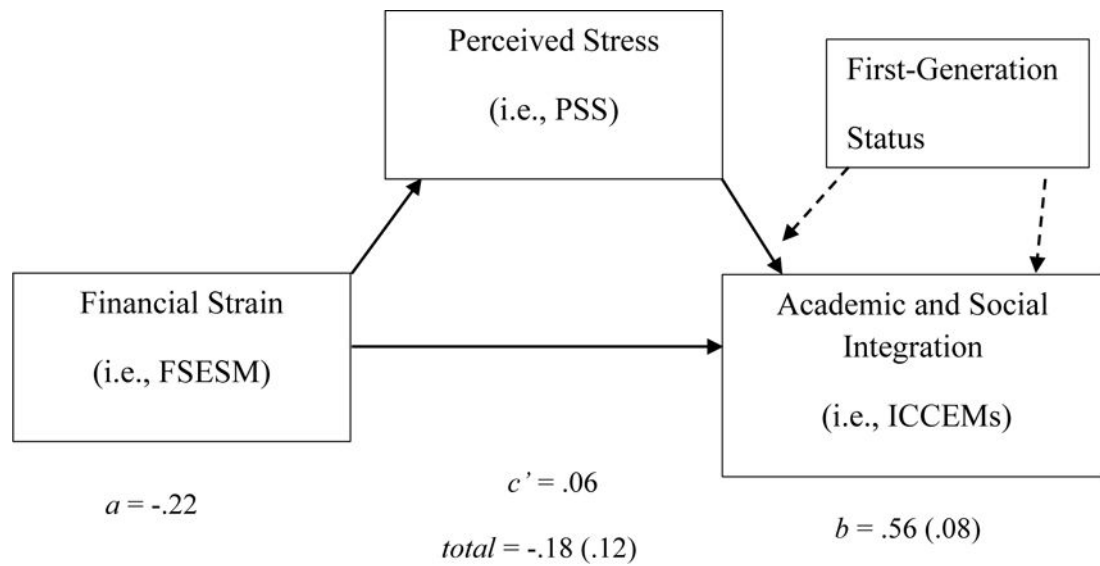
Figure 3.
Model Illustrating how Perceived Stress Mediates the Relationship Between Financial Strain and Academic and Social Integration with First-Generation Status as a Covariate.
Note. All coefficients are standardized and were significant at the $p < .01$ level. Number in parenthesis indicates coefficient standard error. The c' path is the direct effect of the predictor on the dependent variable. The total effect includes the mediator.

Table 1

Descriptive Statistics and Correlations for Study Variables.

| | | | Pearson Correlations | | | | |
Instruments	M	SD	1	2	3	4	5
1. Financial Strain (i.e., FSESM)	2.27	.53	—	-.20 *	-.13	-.15	.30 **
2. Perceived Stress (i.e., PSS)	2.05	.64		—	.50 **	.51 **	-.10
3. Psychological Symptomology (i.e., BSI)	1.91	.73			—	.52 **	-.14
4. Academic and Social Integration (i.e., ICCEMS)	1.67	.73				—	-.18
5. First-generation status[a]	.43	.50					—

*
$p < .05$ (two-tailed).

**
$p < .01$ (two-tailed).

[a]First-generation status was measured by asking respondents their maternal and paternal highest level of completed education (See Table 1). Respondents whom both parents had not graduated from a college or university were classified as a first-generation student, where 0 indicates (*Not First-generation student)* and 1 indicates (*First-generation student).*

Table 2

Participants' Maternal and Paternal Level of Education

Highest level of education received	Number of Mothers who completed each level	Number of Fathers who completed each level
Less than 8th grade	10	13
More than 8th grade but did not graduate from high school	8	14
High school graduate/GED	40	54
Went to college, but did not graduate	33	18
Graduated from a college or university	45	30
Professional training beyond a four year college or university	20	16
Don't know	1	11
Missing	0	1
Total:	**157**	**157**