

Impact of Mental Health, Cultural Integration, Parental Socialization, Substance Use, and Structural Insecurity on the Academic Success Among College Students

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The purpose of this research was to examine variables that impact academic achievement. Using data from the 2020–2021 Healthy Minds Survey conducted by the University of Michigan, the researchers performed two multivariate logistic regression analyses (weighted N = 20,476). Results indicated several connections that impact a college student’s experience and academic success. Implications relating to mental health, campus experience, parental education socialization, substance use, and structural security are examined.

Key words: mental health, substance use, academic success, social determinants, risk factors

For many young adults, college is a time of new opportunities for academic and interpersonal growth, learning, and challenges. The experiences of individuality and independence coupled with developmental exploration and examination alongside academic performance may make college worthwhile for some and dismal for others. The potential stressors of emotional hardships (e.g., being away from home) plus the financial challenges (e.g., growing tuition costs, decreased certainty of finding a job) with the greater academic and social expectations can make this career and developmental stage very challenging for some college students. These issues can impact students' mental health and lead them to various coping resources. This research examines how mental health, cultural integration, parental socialization, substance use, and structural insecurity impact high academic achievement in college students.

Literature Review

Academic achievement is the notion of how well students meet the standards set by the educational institution. In most studies, the frequently used measure of academic achievement is evaluated by grade point averages (GPAs; Richardson et al., 2012). Academic achievement captures a significant emphasis in higher education and throughout many cultures. For some, high achievement performance may be one of the most important goals of the educational process in a competitive world.

MENTAL HEALTH

Since 2011, the number of adults living with mental illness has been rising for individuals between ages 18 and 25 (Substance Abuse and Mental Health Services Administration, 2021). This age range largely consists of college students who experience unique challenges that impact their ability for positive mental health (Eisenberg et al., 2012; McFadden, 2016; Oh et al., 2021), which subsequently negatively affects their GPA scores (Burgard et al., 2013; Watt et al., 2021). Previous literature has established that the following variables negatively impact college students' mental health: the lack of access to and awareness of mental health resources (Antunes-Alves & Langmuir, 2021), adverse childhood experiences (Felitti et al., 1998) in minoritized students (Watt et al., 2021), status as a first-generation college student (McFadden, 2016), lower socioeconomic status (Chen et al., 2015), substance use (Burgard et al., 2013), and lack of social support from peers or university staff (Cordero, 2022). These variables have also been shown to negatively impact a student's academic success in terms of their GPA. This result suggests a relationship between students' academic success and mental health (Antunes-Alves & Langmuir, 2021). To test this relationship, we hypothesize the following:

H_1 : As students' positive mental health increases, the likelihood of receiving mostly A's increases.

One must examine students' relationships with their communities to understand what enables a student to achieve a positive mental health status. Multiple sources of communal support have been shown to lessen the frequency at which a student experiences a feeling of loneliness (Gist-Mackey et al., 2018). Loneliness has an established correlation with a negative impact on mental health (Bu et al., 2020). Loneliness among college students also has a negative impact on a student's grades. To examine this correlation, we suggest the following:

H_2 : As the sense of loneliness increases, the likelihood of receiving mostly A's decreases.

This hypothesis could be particularly interesting because of the increase in students' self-reported experiences of loneliness and isolation during the COVID-19 pandemic (Cordero, 2022; Oh et al., 2021). College students can face multiple stressors and adversities through their college career. Despite this, students can achieve success as a result of several factors (Beauvais et al., 2014; Kim & Hargrove, 2013). A student's level of resiliency during a challenge often predicts the student's ability to successfully meet the challenge (Allan et al., 2014). Resiliency (i.e., students' ability to resist stressors and maintain their homeostatic state; Hamdan-Mansour et al., 2014) is negatively correlated with many risk factors that increase the likelihood of negative mental health (i.e., depression and social isolation; Beauvais et al., 2014; Hamdan-Mansour et al., 2014; Kim & Hargrove, 2013). The literature has identified several factors that negatively impact one's perceived resiliency, such as low socioeconomic status (Chen et al., 2015; Oh et al., 2021), low self-acceptance, low self-awareness (Cordero, 2022), lack of mindfulness practices (Mills, 2016), and minority status (Kim & Hargrove, 2013). To test this relation, we hypothesize the following:

H_3 : As students' resiliency increases, the likelihood of receiving mostly A's increases.

Previous literature has also found that resilience can be cultivated by offering student support and facilitating meaningful connections between the student and the campus community (Allan et al., 2014; Hamdan-Mansour et al., 2014).

CAMPUS INTEGRATION

A sense of belonging is a basic need for students. The inability of students to establish a sense of belonging may signify several risk factors for potential dropout (St-Amand et al., 2017; Vaccaro et al., 2015). Conversely, students who do establish a sense of belonging will likely achieve greater academic success. Previous literature has found that a sense of belonging can impact many aspects of a student's academic life, such as academic outcome, motivation, effort, and absenteeism (Allen & Bowles, 2012). Thus, to test these relations, we posit the following:

H₄: As students' sense of belonging increases, the likelihood of receiving mostly A's increases.

Previous research findings have suggested the difficulty of succinctly defining a "sense of belonging" for postsecondary students (Allen & Bowles, 2012; Allen et al., 2016; St-Amand et al., 2017). In an attempt to develop a standardized definition, St-Amand et al. (2017) examined the literature to identify the four attributes that make up the essence of a sense of belonging: positive emotions, ability to maintain positive relations with their peers, demonstratable energy and willingness to be involved in meaningful ways within a group, and harmonization of the individual and the group. Each of these aspects correlates to other factors that we have identified that affect a student's academic success. The first aspect relates to the student's positive mental health, discussed earlier. The second and fourth aspects speak to the quality and quantity of the student's engagement within groups such as student organizations.

Student organizations are a primary way that students engage in their campus community, and their protective factors for ensuring academic success have been greatly explored in the previous literature (Allen & Bowles, 2012; St. Amand, 2017; Strayhorn, 2018; Vaccaro et al., 2015), especially in relation to first-generation college students (FGCS; Gist-Mackey, 2017; Stebleton, 2014). To determine the portability of this relation, we hypothesize the following:

H₅: Students who participate in student organizations are more likely to receive mostly A's than are students who do not participate in student organizations.

Further research has also shown that the impact the student organization has on the student varies by the type of student organization (i.e., political organization or academic organization), the ethnic background of the student, and the student's satisfaction with the organization (Baker, 2008; Pauley, 2019).

Along with student engagement in student organizations, a student's residential status (i.e., living on campus or living off campus) has previously been identified as significantly impacting the student's academic success. Previous literature finds that living in a residential hall or in an on-campus residence would increase students' positive socialization and positively impact their academic success. This impact is most commonly associated with students' increased likelihood of involvement with on-campus programming or student organizations such as living-learning communities (Long, 2014; McCay, 2020). McCay (2020) also established that programming such as living-learning communities that do not have faculty residing in them had been well demonstrated to increase factors that lead to further academic success, such as a student's sense of belonging (Strayhorn, 2018). There needs to be

more clarity within the current literature regarding the significance of a student's residential type. One study has found that there is, in fact, a negligible difference in academic success between those residing on and off campus (Graham et al., 2018). One explanation for this difference could be the residential housing options offered for the differing sample populations (Long, 2014; McCay, 2020). Long (2014) found that a residential place must be a safe and inclusive environment for students in order to provide them with effective learning opportunities. To further this discussion and to test this relation using the nationwide sample of data provided by the Healthy Minds Study, we hypothesize the following:

H_6 : Students who live in on-campus housing (not including fraternity or sorority houses) are more likely to receive mostly A's than are students who do not live in on-campus housing.

EDUCATIONAL PARENTAL SOCIALIZATION

College students need to enter the college community with an equal amount of resources and support at their disposal. In particular, minoritized students and FGCS are at particular risk of lower academic success as a result of the specific barriers they face at a high frequency. In particular, previous research has found that person of color (POC) students from low-poverty neighborhoods are at higher physical health risks because of the resilience they have had to maintain to enter the college community successfully. These POC students must also strive harder to obtain the protective factors that their advantaged peers have obtained more easily, such as a sense of belonging with the campus community or positive mental health (Chen et al., 2015; Oh et al., 2022). The previous literature has also identified that as a POC student's adverse childhood experiences number increases to four, the POC student will face barriers to academic success compared with their nonminoritized peers (Watt et al., 2021). A student's parent's highest obtained educational level is one of the many factors contributing to their academic success. If a parent does not understand the cultural and systematic dynamics of the university setting, the parent is more likely to struggle to support their student in connecting them to appropriate on-campus resources (Grim et al., 2024). To further test the importance of the student's parent's educational level, we hypothesize the following:

H_7 : As the levels of education among students' parents or guardians increase, the likelihood of receiving mostly A's increases.

SUBSTANCE USAGE

College has many stressors that students must navigate to obtain academic success. Some students may resort to the illicit or problematic use of substances such as cigarettes, vape pens, alcohol, and other illicit drugs as a form of self-soothing to

manage more impactful stressors (Burgard et al., 2013; Phillips et al., 2015). College students' drinking behaviors have been a frequent focus of research (White & Hingson, 2013), particularly the exposure to the drinking behaviors of FGCS (Ray et al., 2014). Two of the motivators to drink established by previous research are socialization and perceived social acceptability (Ray et al., 2014).

Similarly, stimulant use is often widespread on a college campus. College students often call these stimulants "study drugs" (Abelman, 2017). These drugs impact a student by increasing their perceived productivity and motivation while not affecting their actual productivity (Abelman, 2017).

H_{8a-d} : Students who use (a) cigarettes, (b) vape pens, (c) alcohol, and (d) illicit substances are less likely to receive mostly A's than are those who do not use these.

STRUCTURAL SECURITY

Many college students matriculate through college while maintaining part-time employment through either the school or community employers. This situation is particularly true for FGCS, who may have different financial or familial supports than their second-generation peers plausibly have (Pascarella et al., 2004; Wowk, 2020). Despite this common experience, the previous literature is divided in the findings when attempting to determine how working more hours impacts a student's academic success. Older literature suggests that as college students' nonacademic working hours increase, their academic achievement will decrease (Pascarella et al., 2004). Studies that are more current have not found statistical significance in the correlation between hours worked and academic success for a student (Boswell & Passmore, 2013; Krumrei et al., 2013; Wowk, 2020). Krumrei et al. (2013) postulates that this correlation could indicate that college students could have increased time-management skills that help to negate the effect that working during college has on student success. To attempt to clarify further the impact that nonacademic working hours have on college students, we hypothesize the following:

H_9 : As hours worked per week increase, the likelihood of receiving mostly A's decreases.

Despite not being definitively correlated with academic success, an increase in nonacademic working hours was found to be correlated with less financial aid assistance and a greater chance of taking a semester off from college. Students working more hours outside the college are less likely to enroll less than full-time students (Boswell & Passmore, 2013).

A factor that has been found to motivate students to obtain more nonacademic

working hours during college is the stress of their financial situation (Pascarella et al., 2004). A student's financial stress has also been correlated with a student's likelihood of discontinuing their college education (Britt et al., 2016), which associates with previous literature stating that students who work more outside of college are more likely to take a semester off from college (Boswell & Passmore, 2013). Factors contributing to greater financial stress, such as the inability to afford basic needs, have been associated with lower college student GPA scores (Britt et al., 2016). We then hypothesize the following:

H_{10} : As the stressfulness of students' financial situation increases, the likelihood of receiving mostly A's decreases.

Another basic need that impacts many college students is their ability to obtain adequate food. Previous research has found that food insecurity is a major factor in students' ability to have a successful experience in college. Among youth who graduated from government foster care programs, food insecurity was identified as one of their main concerns and a significant reason for not pursuing a college degree (Rendon, 2019). As the cost of college tuition increases, college students are more likely to rely on financial aid to obtain a college degree and remain academically successful. In a 2019 national survey, 45% of the student population surveyed reported that they had experienced food insecurity within the past 30 days (Goldrick et al., 2019). Fortunately, there is a consensus in the previous literature that tangible support programs to ensure that students' basic needs are met year-round help to increase student retention rates and the academic success of these at-risk students (Goldrick et al., 2019; Rendon, 2019). Therefore, we hypothesize the following:

H_{11} : Students who experience food insecurity are less likely to receive mostly A's than are students who do not experience food insecurity.

Methods

DATA

Data for this study came from the fall 2020 to spring 2021 Healthy Minds Survey conducted by the University of Michigan at 79 universities and colleges (and one nationwide fraternity) in the United States and Canada. Thirteen are community colleges, 25 are private colleges/universities, 40 are public colleges/universities, and, again, one national fraternity. The colleges and universities represent 28 states and one Canadian university. The survey was conducted online among college students ages 18 and older using the Qualtrics platform. The data were weighted to correct for gender, race/ethnicity, academic level, GPA, and nonresponse patterns ($N = 139,470$).

The data were analyzed using two multivariate logistic regression analyses to test the hypotheses. The final sample size in the multivariate analyses was much smaller (weighted $N = 20,476$).

VARIABLES

Dependent variable. The dependent variable in this study is high academic achievement, measured with the survey question “What is your current overall GPA?” The response options ranged from *mostly A’s* to *mostly F’s*, with the option of selecting up to two options. However, for this study, the focus was on those who selected that they received mostly A’s; therefore, the response options were 0 (*not mostly A’s*) and 1 (*mostly A’s*).

Independent variables. The independent variables fall into five categories: mental health, campus experience, parental socialization, substance use, and structural security. For mental health, three mean indices were created. The first mean index accounted for students’ level of positive mental health, which consisted of responses to the following eight statements ($\alpha = .917$): (a) “I lead a purposeful and meaningful life,” (b) “My social relationships are supportive and rewarding,” (c) “I am engaged and interested in my daily activities,” (d) “I actively contribute to the happiness and well-being of others,” (e) “I am competent and capable in the activities that are important to me,” (f) “I am a good person and live a good life,” (g) “I am optimistic about my future,” and (h) “People respect me.” The response options were 0 (*strongly disagree*), 1 (*disagree*), 2 (*somewhat disagree*), 3 (*mixed/neither agree or disagree*), 4 (*somewhat agree*), 5 (*agree*), and 6 (*strongly agree*). The index ranged from 0 to 60.

The second mean index measured students’ level of loneliness, which consisted of answers to the following three questions ($\alpha = .841$): (a) “How often do you feel you lack companionship,” (b) “How often do you feel left out,” and (c) “How often do you feel isolated from others?” The response options were 0 (*hardly ever*), 1 (*some of the time*), and 2 (*often*). The index ranged from 0 to 20.

The third mean index accounts for students’ level of resiliency, according to six agreement statements ($\alpha = .853$): (a) “I tend to bounce back quickly after hard times,” (b) “I usually come through difficult times with little trouble,” (c) “It does not take me long to recover from a stressful event,” (d) “It is hard for me to snap back when something bad happens,” (e) “I have a hard time making it through stressful events,” and (f) “I tend to take a long time to get over setbacks in my life.” The response options for the first three statements were 0 (*strongly disagree*), 1 (*disagree*), 2 (*neutral*), 3 (*agree*), and 4 (*strongly agree*), and the response options for the last three statements were 0 (*strongly agree*), 1 (*agree*), 2 (*neutral*), 3 (*disagree*), and 4 (*strongly disagree*). The index ranged from 0 to 40.

The second category of independent variables—campus experience—comprises three variables: level of sense of belonging, participation in student organizations, and living situation. The first measure is a mean index that accounts for students' sense of belonging, consisting of responses to four statements associated with the question, "How much do you agree with the following statements?" ($\alpha = .747$). The first two statements were (a) "I see myself as a part of the campus community" and (b) "I fit in well at my school." The response options were 0 (*strongly disagree*), 1 (*disagree*), 2 (*somewhat disagree*), 3 (*somewhat agree*), 4 (*agree*), and 5 (*strongly agree*). The last two statements were (a) "I feel isolated from campus life" and (b) "Other people understand more than I do about what is going on at my school." The response options were 0 (*strongly agree*), 1 (*agree*), 2 (*somewhat agree*), 3 (*somewhat disagree*), 4 (*disagree*), and 5 (*strongly disagree*). The index ranged from 0 to 50.

The second variable measured whether a student participates in any student organization, by using the survey question "What activities do you currently participate in at your school?" Students were allowed to select as many categories as they wished from 17 categories of student organizations, including an *other* category; they also had the option to select that they do not participate in any student organizations. For this study, the latter question was used to account for whether students participate in any organization, which was recorded as 0 (*no*), that is, they did not participate in any student organization, and 1 (*yes*), that is, they did participate in at least one student organization.

The third measure accounted for students' living situation, which was measured with the survey question "Where do you currently live?" The original response options were 1 (*on-campus housing, residence hall*), 2 (*on-campus housing, apartment*), 3 (*fraternity or sorority house*), 4 (*on- or off-campus cooperative housing*), 5 (*off-campus, non-university housing*), 6 (*with my parents (or relatives)*), and 7 (*other*); however, they were recoded to 0 (*on-campus housing*), which included 1 (*on-campus housing, residence hall*) and 2 (*on-campus housing, apartment*), 1 (*fraternity and sorority house*) and 2 (*off-campus (or on-campus cooperative housing)*).

The third category of independent variables was parental socialization, which consisted of one variable measuring parents' education level. Parents' level of education was measured using the survey question "What is the highest level of education completed by your parents or stepparents?" The response options were 0 (*8th or lower*), 1 (*between 9th and 12th grade (but no degree)*), 2 (*high school degree*), 3 (*some college (but no degree)*), 4 (*associate's degree*), 5 (*bachelor's degree*), and 6 (*graduate degree*). This measure accounted for the highest level of education of at least one parent or guardian.

The fourth category of independent variables was substance use, which included four variables: cigarette use, vape pen use, alcohol use, and illicit substance use: (a) “Over the past 30 days, have you smoked cigarettes,” (b) “Over the past 30 days, have you used an electronic cigarette or vape pen,” and (c) “Over the past 2 weeks, did you drink any alcohol?” The response options to these three questions were 0 (*no*) and 1 (*yes*). Illicit substance use was measured on the basis of the survey question “Over the past 30 days, have you used any of the following drugs?” The original response options included marijuana, cocaine, heroin, opioid pain relievers “without a prescription or more than prescribed,” benzodiazepines, methamphetamines, “other stimulants without a prescription or more than prescribed,” MDMA, ketamine, LSD, psilocybin, kratom, athletic performance enhancers, and “other drugs without a prescription”; however, students had the option to select “none of these,” which was used as the basis for the measure and was recoded so that 0 (*no*) represented “none of these” and 1 (*yes*) represented the selection of at least one of the aforementioned substances.

The fifth category of independent variables was structural security, which focused on three financial and food security measures. First, hours worked per week were measured using the survey question “What is the average number of hours you work per week during the school year (paid employment only)?” The original response options ranged from 0 hours to more than 168 hours; however, it was recoded as follows: 0 (*0 hours*), 1 (*1–10*), 2 (*11–20*), 3 (*21–40*), and 4 (*over 40*). Financial stress was measured using the survey question “How would you describe your financial situation right now?” The response options were 0 (*never stressful*), 1 (*rarely stressful*), 2 (*sometimes stressful*), 3 (*often stressful*), and 4 (*always stressful*). Food insecurity was measured using a survey question that asked about the truth of the following statement: “Within the past 12 months, I worried whether our food would run out before we got money to buy more.” The original response options were 1 (*often true*), 2 (*sometimes true*), and 3 (*never true*); however, they were recoded as 0 (*never true*) and 1 (*at least sometimes true*).

Control variables. This study also included 12 control variables: (a) the amount of time spent studying per week, (b) transfer status, (c) the importance of religion, (d) relationship status, (e) age, (f) race, (g) sexuality, (h) sex, (i) the graduation rate at their school, (j) whether their school is public or is private, (k) the size of their school, and (l) the region within which their school is located. The study time was measured using the survey question “How much time do you spend during a typical week studying/doing homework?” The response options were 0 (*less than 1 hour/week*), 1 (*1–2 hours/week*), 2 (*3–5 hours/week*), 3 (*6–10 hours/week*), 4 (*11–15 hours/week*), 5 (*16–20 hours/week*), and 6 (*more than 20 hours/week*). Transfer status was measured with the survey question “Did you transfer from another campus/institution to this

school?" The response options were 0 (*no*), 1 (*yes, I transferred from a 4-year college or university*), and 2 (*yes, I transferred from a community or junior college*).

The importance of religion was measured using the survey question "How important is religion in your life?" The response options were 0 (*very unimportant*), 1 (*unimportant*), 2 (*neutral*), 3 (*important*), and 4 (*very important*). Relationship status was measured with the survey question "How would you characterize your current relationship status?" The response options were 0 (*single*), 1 (*in a relationship*), 3 (*married, in a domestic partnership, or engaged*), and 4 (*other*), which consisted of divorced or separated, widowed, and other arrangements. Age was measured using the survey question "How old are you?"

Race was measured using the survey question "What is your race/ethnicity?" The original response options 0 (*White*), 1 (*African American/Black*), 2 (*American Indian or Alaskan Native*), 3 (*Asian American/Asian*), and 4 (*Hispanic/Latino/a*), 5 (*Native Hawaiian or Pacific Islander*), 6 (*Middle Eastern, Arab, or Arab American*), and 7 (*self-identify*); however, the responses were recoded to 0 (*White*), 1 (*African American/Black*), 2 (*Asian American/Asian*), 3 (*Hispanic/Latino/a*), and 4 (*other*), which included American Indian; Alaskan Native; Native Hawaiian or Pacific Islander; Middle Eastern, Arab, or Arab American; and those who self-identify as another race or ethnicity.

Sexuality was measured using the survey question "How would you describe your sexual orientation?" The response options were coded as 0 (*heterosexual*) and 1 (*not heterosexual*). Sex was measured using the survey question "What was your sex at birth?" The response options were coded 0 (*male*) and 1 (*female*). Although *intersex* was an option, the response rate was very low: 65 out of 139,262. Because the low response rate produced statistical issues in the logistic regression analysis, *intersex* was removed.

The graduation rate and size of the student body were accounted for through publicly available information about the school from which students attended at the time that the Healthy Minds Survey was conducted at the given campuses. The student body was coded 0 (*under 1,000*), 2 (*1,000–4,999*), 3 (*5,000–9,999*), 4 (*10,000–19,999*), and 5 (*20,000 or more*). Public versus private status was coded 0 (*private*) and 1 (*public*). The students' school region was coded as 0 (*South*), 1 (*Northeast*), 2 (*Midwest*), and 3 (*West*).

Results

Table 1 presents the descriptive statistics for the hypotheses.

Table 1
Descriptive Statistics

	No	Yes				Total
Receives primarily A's	57.3%	42.7%				100%
	71,934	53,593				125,527
Active in campus organization	48.6%	46.8%				100%
	61,750	65,303				127,053
Smoke cigarettes	93.1%	6.9%				100%
	11,309	8,208				118,517
Use vape pens	85.3%	14.7%				100%
	100,823	17,421				118,244
Drink alcohol, 2 weeks	51.2%	48.8%				100%
	62,390	59,360				121,750
Use illicit substance, past 30 days	79.1%	20.9%				100%
	92,285	24,420				116,705
Worry about food insecurity	71.4%	28.6%				100%
	96,454	38,565				135,020
Sex	Male	Female				Total
	40.7%	59.3%				100%
	56,607	82,590				139,197
Sexuality	Hetero	Not Hetero				Total
	77.4%	22.6%				100%
	106,617	31,144				137,762
Institution type	Private	Public				Total
	31.5%	68.5%				100%
	43,973	95,497				139,470
Living situation	On campus	Greek	Off campus			Total
	24.1%	.9%	74.9%			100%
	31,754	1,234	98,611			131,600
Transfer to current school (from)	No	4-year	Junior college			Total
	77.4%	8.6%	14%			100%
	62,185	6,928	11,271			80,384
Region	South	Northeast	Midwest	West		Total
	40.8%	15%	22.9%	21.3%		100%
	56,885	20,884	31,949	29,752		139,470

Relationship status	Single	In relationship	Married/ Engaged	Other		Total
	50.8%	33.6%	13.6%	2.1%		100%
	70,672	46,764	18,882	2,866		139,184
Race	White	Black	Asian	Hispanic	Other	Total
	58%	13.8%	10.4%	11.9%	6%	100%
	80,507	19,076	14,373	16,482	8,259	138,697
	M	SD	Min-Max	α		Total
Sense of belonging (index)	25.33	10.50	0-50	.747		54,942
Positive mental health (index)	43.93	11.65	0-60	.917		125,114
Loneliness (index)	8.97	6.54	0-20	.841		121,555
Resilience (index)	22.74	7.95	0-40	.853		53,319
Hours worked per week	1.45	1.35	0-4			133,045
Hours spent studying weekly	3.45	1.51	0-6			130,095
Importance of religion	2.25	1.37	0-4			133,102
Parent's education level	4.30	1.64	0-6			130,578
Financial stress level	2.23	1.13	0-4			135,188
Age	23.88	7.85	0-90			139,470
Graduation rate	.568	.215	.13-.98			139,470
Student body size	1.16	1.19	0-4			139,470

Table 2 displays the results of the two multivariate logistic regression analyses with the coefficient for constant (B), standard error around the coefficient for the constant (SE), exponentiation of the B coefficient (Exp[B]), and 95% confidence interval for each model.

Table 2

Multivariate Logistic Regression Analysis of the Likelihood of Receiving Mostly A's

	Model 1				Model 2			
	B	SE	Exp(B)	95% CI	B	SE	Exp(B)	95% CI
Positive mental health	.020***	.002	1.020	[1.017, 1.023]	.017***	.002	1.017	[1.014, 1.020]
Loneliness	.011***	.003	1.011	[1.006, 1.017]	.015***	.003	1.016	[1.010, 1.021]
Resilience	.021***	.002	1.021	[1.017, 1.025]	.019***	.002	1.020	[1.015, 1.024]
Belonging	.005***	.002	1.005	[1.002, 1.009]	.004**	.002	1.004	[1.001, 1.008]
Participate, student org.	.281***	.034	1.325	[1.240, 1.415]	.302***	.034	1.353	[1.266, 1.445]
Living situation (on campus)	—	—	—	—	—	—	—	—
Greek housing	.072	.190	1.073	[.740, 1.501]	.044	.190	1.045	[.720, 1.518]
Off campus	.065*	.033	1.067	[1.000, 1.140]	.061	.034	1.063	[.995, 1.136]
Cigarette	-.325***	.064	.723	[.637, .819]	-.277***	.065	.758	[.668, .860]

Vape	-.295***	.043	.745	[.685, .810]	-.267***	.043	.766	[.704, .834]
Alcohol	-.181***	.031	.834	[.786, .886]	-.174***	.031	.840	[.791, .893]
Illicit substance	-.178***	.037	.837	[.778, .900]	-.159***	.038	.853	[.793, .918]
Parent education	.087***	.010	1.091	[1.070, 1.113]	.054***	.010	1.055	[1.034, 1.077]
Hours worked per week	-.047***	.012	.954	[.932, .977]	-.018	.012	.982	[.958, 1.006]
Financial stress	—	—	—	—	-.150***	.015	.861	[.835, .887]
Food insecurity	—	—	—	—	-.303***	.039	.738	[.685, .797]
Hours studying per week	.173***	.010	1.189	[1.116, 1.213]	.184***	.010	1.201	[1.178, 1.226]
Transfer status (from) (none)	—	—	—	—	—	—	—	—
Other 4-year institution	.034	.053	1.034	[.932, 1.148]	.069	.053	1.071	[.965, 1.190]
2-year college	.125**	.044	1.133	[1.039, 1.236]	.178***	.045	1.194	[1.095, 1.303]
Importance of religion	-.028*	.011	.972	[.951, .994]	-.018	.011	.982	[.961, 1.004]
Relationship status (single)	—	—	—	—	—	—	—	—
In a relationship	-.004	.031	.996	[.938, 1.058]	.039	.031	1.039	[.978, 1.104]
Engaged/Married	.121*	.062	1.129	[1.000, 1.275]	.144*	.063	1.155	[1.022, 1.305]
Other	.005	.123	1.005	[.790, 1.278]	.073	.123	1.076	[.845, 1.369]
Age	.026***	.003	1.026	[1.020, 1.032]	.025***	.003	1.026	[1.020, 1.032]
Race (White)	—	—	—	—	—	—	—	—
Black	.427***	.063	1.532	[1.355, 1.732]	.377***	.063	1.457	[1.288, 1.649]
Asian	-.517***	.076	.596	[.514, .692]	-.504***	.076	.604	[.520, .702]
Hispanic	.478***	.076	1.612	[1.388, 1.872]	.440***	.077	1.553	[1.336, 1.805]
Other	-.007	.076	.993	[.856, 1.152]	-.012	.076	.988	[.851, 1.147]
Not heterosexual	.064	.034	1.066	[.997, 1.140]	.097**	.034	1.102	[1.030, 1.179]
Female	.328***	.030	1.388	[1.308, 1.472]	.348***	.030	1.417	[1.335, 1.503]
Graduation rate	.267*	.112	1.306	[1.048, 1.626]	.052	.113	1.054	[.844, 1.316]
Public institution	-.178***	.044	.837	[.768, .912]	-.169***	.044	.845	[.774, .921]
Region (South)	—	—	—	—	—	—	—	—
Northeast	.100*	.046	1.105	[1.009, 1.210]	.116*	.047	1.122	[1.024, 1.230]
Midwest	-.156***	.042	.855	[.788, .928]	-.155***	.042	.856	[.789, .930]
West	.055	.044	1.057	[.970, 1.151]	.064	.044	1.066	[.993, 1.162]
Constant	-4.242***				-3.508***			
Model χ^2	2610.850***				2879.337***			
Nagelkerke r^2	.137				.150			
-2 log-likelihood	30333.803				30065.317			

Note. $N = 20,476$. Cells with dashes denote reference categories. In logistic regression, these reference categories serve as baselines for comparison, with coefficients, standard errors, odds ratios, and confidence intervals for other levels reported relative to these baselines, which are implicitly assigned a coefficient of 0 and an odds ratio of 1.0. This approach ensures accurate estimation by preventing multicollinearity and facilitates interpretation of the effects of categorical predictors on the outcome. org. = organization.

* $p < .05$. ** $p < .01$. *** $p < .001$.

According to descriptive statistics, 42.7% of the sample received primarily A's. As a result of a multivariate logistic regression analysis (Model 1), nearly 14% (Nagelkerke $r^2 = .137$) of the likelihood of receiving primarily A's is explained by the independent variables in the model, Model $\chi^2(28) = 2610.85, p < .001$. Two of the three hypotheses were supported regarding the first category of independent variables (i.e., mental health). Consistent with H_1 , for every 1-point increase in the level of positive mental health, the likelihood of receiving primarily A's increases by 2%, $\text{Exp}(B) = 1.020$, Wald $\chi^2(1) = 132.51, p < .001$. Contrary to H_2 , for every 1-point increase in loneliness, the likelihood of receiving A's increases by 1.1%, $\text{Exp}(B) = 1.011$, Wald $\chi^2(1) = 16.82, p < .001$. Consistent with H_3 , for every 1-point increase in the level of resiliency, the likelihood of receiving A's increases by 2.1%, $\text{Exp}(B) = 1.021$, Wald $\chi^2(1) = 102.57, p < .001$.

Two of the three hypotheses were supported for the second category of variables (i.e., campus experience). First, consistent with H_4 , for every 1-point increase in the level of sense of belonging, the likelihood of receiving mostly A's increases by .2%, $\text{Exp}(B) = 1.002$, Wald $\chi^2(1) = 10.14, p < .001$. Second, consistent with H_5 , students who participate in at least one student organization are nearly 33% more likely to receive mostly A's than are students who do not participate in student organizations, $\text{Exp}(B) = 1.325$, Wald $\chi^2(1) = 70.39, p < .001$. Third, contrary to H_6 , there was not a statistically significant difference in the likelihood of receiving mostly A's between students who lived in on campus (noncooperative) housing and students who lived in sorority or fraternity houses or between students who lived in on campus (noncooperative) housing and students who live off campus or in on-campus cooperative housing.

The third category of variables (i.e., parental educational socialization) had only one hypothesis, which was supported. Consistent with H_7 , as the education of students' parents increases, the likelihood of receiving mostly A's increases by slightly more than 9%, $\text{Exp}(B) = 1.091$, Wald $\chi^2(1) = 73.29, p < .001$.

All four hypotheses related to substance use (i.e., H_{8a-d} , fourth category) were supported. Specifically, students who smoked cigarettes were just under 28% less likely to receive mostly A's than were students who did not smoke cigarettes, $\text{Exp}(B) = .723$, Wald $\chi^2(1) = 25.67, p < .001$. Students who used vape pens were just under 26% less likely to receive mostly A's than were students who did not use vape pens, $\text{Exp}(B) = .745$, Wald $\chi^2(1) = 47.02, p < .001$. Students who consumed alcohol in the past two weeks were just under 17% less likely to receive mostly A's than students who did not consume alcohol in the past 2 weeks, $\text{Exp}(B) = .834$, Wald $\chi^2(1) = 25.67, p < .001$. Similarly, students who used illicit substances (including marijuana) were slightly more than 16% less likely to receive mostly A's than were students who did not use illicit substances (including marijuana), $\text{Exp}(B) = .837$, Wald $\chi^2(1) = 22.87, p < .001$.

Structural security, the fifth category of independent variables, produced unexpected results, which required the second logistic regression model to understand completely. Model 1 only included the hours that students worked per week, which was statistically significant and thus supported H_9 . Specifically, as the number of hours worked per week increased, the likelihood of receiving mostly A's decreased by slightly less than 5%, $\text{Exp}(B) = .954$, $\text{Wald } \chi^2(1) = 14.60$, $p < .001$. However, financial stress and food insecurity were added to Model 2, which were highly significant and removed the significance of hours worked per week. With the addition of financial stress and food insecurity added to the analysis, the explanatory power of the model increases by 1.3%, that is, 15% of the likelihood of receiving mostly A's is explained by adding these two variables to the model (Nagelkerke $r^2 = .150$, Model $\chi^2 = 2879.34$, $p < .001$). Specifically, although hours worked per week were no longer statistically significant, as financial stress increases, the likelihood of receiving mostly A's decreases by nearly 14%, $\text{Exp}(B) = .861$, $\text{Wald } \chi^2(1) = 97.76$, $p < .001$, consistent with H_{10} . Moreover, consistent with H_{11} , students who experience food insecurity are more than 26% less likely to receive mostly A's than are students who do not experience food insecurity, $\text{Exp}(B) = .738$, $\text{Wald } \chi^2(1) = 61.47$, $p < .001$. It should be noted that the addition of financial stress and food insecurity did not impact the significance (or lack thereof) of any previous hypotheses (i.e., H_{1-8}).

The control variables provided interesting and, in some cases, unexpected results. The findings were reported for Model 1 unless otherwise addressed. Model 2 is addressed only when findings significantly and substantively differ between the two models. First, the number of hours students spend studying each week is positively associated with the likelihood of receiving mostly A's, $\text{Exp}(B) = 1.189$, $\text{Wald } \chi^2(1) = 298.62$, $p < .001$. Second, students who transferred from junior or 2-year colleges were more than 13% more likely to receive A's than were students who did not transfer into their current institution, $\text{Exp}(B) = 1.133$, $\text{Wald } \chi^2(1) = 8.01$, $p < .01$. However, there was not a statistically significant difference in the likelihood of receiving A's between students who transferred from other 4-year schools to their current school and students who did not transfer into their current school. Third, although the importance of religion was negatively correlated with the likelihood of receiving mostly A's in Model 1, $\text{Exp}(B) = .972$, $\text{Wald } \chi^2(1) = 6.42$, $p < .05$, the significance of the importance of religion on the likelihood of receiving A's went away when controlling for financial stress and food insecurity in Model 2.

Fourth, although the likelihood of receiving A's did not have statistically significant differences between students who are single and students who are in relationships, married or engaged, or in other relationship arrangements in Model 1, when controlling for financial stress and food insecurity in Model 2, students who were married or engaged were nearly 16% more likely to receive A's than were single

students, $\text{Exp}(B) = 1.155$, $\text{Wald } \chi^2(1) = 5.30$, $p < .05$. Fifth, as age increases, the likelihood of receiving mostly A's increases by slightly less than 3%, $\text{Exp}(B) = 1.026$, $\text{Wald } \chi^2(1) = 73.36$, $p < .001$. Sixth, students who are Black are more than 53%, $\text{Exp}(B) = 1.532$, $\text{Wald } \chi^2(1) = 46.45$, $p < .001$, more likely, and Hispanic students are more than 61%, $\text{Exp}(B) = 1.612$, $\text{Wald } \chi^2(1) = 39.21$, $p < .001$, more likely to receive A's than students who are White. However, students who are Asian or Asian American are more than 40%, $\text{Exp}(B) = .596$, $\text{Wald } \chi^2(1) = 46.29$, $p < .001$, less likely to receive mostly A's than are students who are White. Students who were in other racial/ethnic categories did not have a statistically significant difference in the likelihood of receiving A's to students who were White.

Seventh, although there was not a statistically significant difference in the likelihood of receiving A's between students who were heterosexual (and not questioning) and not heterosexual (or questioning) in Model 1, when controlling for financial stress and food insecurity in Model 2, students who were not heterosexual or questioning their sexuality were just over 10% more likely to receive A's than were students who were heterosexual and not questioning their sexuality, $\text{Exp}(B) = 1.102$, $\text{Wald } \chi^2(1) = 7.94$, $p < .01$. Eighth, female students were nearly 39% more likely to receive A's than were male students, $\text{Exp}(B) = 1.388$, $\text{Wald } \chi^2(1) = 118.40$, $p < .001$. Ninth, although graduation rates at students' schools were positively related to the likelihood of receiving A's in Model 1, $\text{Exp}(B) = 1.306$, $\text{Wald } \chi^2(1) = 5.67$, $p < .05$, when controlling for financial stress and food insecurity, the impact of graduation rates on the likelihood of receiving mostly A's disappeared. Tenth, the student body size did not significantly impact the likelihood of receiving A's.

Finally, the likelihood of receiving A's did generally vary between schools in the South and schools in other regions. Specifically, although there was not a statistically significant difference in the likelihood of receiving A's among students at schools in the South and students at schools in the West, students at schools in the Northeast were slightly less than 11% more likely to receive A's than were students at schools in the South, $\text{Exp}(B) = 1.105$, $\text{Wald } \chi^2(1) = 4.63$, $p < .05$, and students at schools in the Midwest were nearly 15% less likely to receive A's than students at schools in the South, $\text{Exp}(B) = .855$, $\text{Wald } \chi^2(1) = 13.99$, $p < .001$.

Discussion

IMPLICATIONS

This study demonstrates several connections that will impact a college student's experience and academic success. Knowing how these correlations interact with one another could be impactful when attempting to identify college students at risk of

facing greater barriers to academic success and developing intervention strategies to help ensure the student's academic success.

Mental health. The importance of mental health has been a growing focus in the higher education setting, and the results of this study provide insight into why improving the mental health of college students translates to greater student academic success. This study's support of H_1 and H_3 demonstrates this relationship between mental health and the academic success of college students. This support indicates the benefit of a college monitoring their students' mental health status and resiliency level. The support for H_1 also demonstrates the importance of connecting students identified as being at risk to counseling resources on campus. A college conducting mental health check-ins with its students could connect at-risk students with resources to increase their resiliency through educational or relational initiatives. A university may consider administering a short battery of mental health assessments such as the PHQ-9, GAD-7, or other campus-specific assessments in order to establish a baseline and the ability to track a student's mental health status throughout their college career. This process could provide the appropriate monitoring that would allow mental health professionals and academic advisors to implement targeted interventions such as intentionally establishing a greater sense of rapport with specific students or connecting them with specifically designed group counseling supports.

Unexpectedly, this study did not support H_2 , suggesting that lonely students on campus receive better grades. This notion is surprising because loneliness has been associated with lower positive mental health rates (Bu et al., 2020). Findings could demonstrate that high-achieving students might also have some risk of mental distress. This distress would come from a need for more fulfilling social engagement or an overabundance of alone time. The lack of support for H_2 demonstrates that even students not likely to be put on a critical intervention list probably need some support themselves. If loneliness is not identified, high-achieving students may be at risk of mental distress, negatively impacting their academic success. This result could represent that students could benefit from healthy boundary building to find an adaptive balance between the many social opportunities that college provides and the academic study that students are there to achieve. This finding may indicate that group psychoeducation interventions may be appropriate for students who are high achieving academically to best ensure their retention.

Campus experience. When measuring a student's social health, we often consider their sense of belonging in the campus community (McCay, 2020; Strayhorn, 2018). The results of this study supported H_4 , which shows us that a student's sense of belonging impacts their ability to achieve academic success. At this point, the natural question for colleges is, How can we increase students' sense of belonging? For the answer, we can

look toward this study's support of H_5 , which states that students who engage with at least one social group are roughly 33% more likely to receive mostly A's. This finding means that, although a campus could focus its interventions on several individual levels, a good first step is encouraging students to engage with at least one social group. This result demonstrates the importance of students' peer socialization to their academic success. Colleges should consider how they implement initiatives to engage with at-risk students through their student organizations on campus.

This study did not support H_6 and found no correlation between where the student lives and their academic success. This finding shows us that students on campus do not have any direct advantage over those living off campus regarding their academic success. It is important to keep in mind that where the students are living does impact their ability to access certain resources and support (Long, 2014; McCay, 2020) and that when students move off campus, they may face more systemic stressors than they were unprepared for (Chen et al., 2015; Oh et al., 2022). This result may demonstrate that requiring students to live on campus may not be a protective factor during the orientation process to campus life. This could also indicate that a college may see a return on their efforts when they attempt to initiate and engage with their students rather than relying on their proximity to campus to encourage them to attend an event. For instance, support groups or social engagement groups that cater to both on-campus and off-campus groups may reach a wider audience than dorm-specific activities.

Parental education socialization. Another important area of support comes from the student's parents. As our study demonstrates through the support for H_7 , as a student's parent's education level increases, so does the likelihood that the student will succeed academically. This finding appears to indicate that the more exposure a parent has to higher education, the greater their ability to provide effective support to their college student. A tangible way for institutions to reduce this risk of lower academic performance and reduced persistence associated with lower parental education is to develop family-centered interventions. Currently research is limited on specific interventions that are effective. However, Stormshak et al. (2019) found that using a modified model of the Family Check-Up proved effective in reducing a student's risk behaviors. This result demonstrates that institutions are able to influence a student's retention factors; further research and development of applied intervention programs that involve a student's family are needed. In particular, family members of FGCS would benefit from culturally relevant interventions that address the specific barriers that FGCS will likely face (Oh et al., 2022; Watt et al., 2021). For example, Grim et al. (2024) found that simply shifting perspectives to ask if an institution is "student ready" rather than placing the deficit with the student in asking if they are "college ready" allows for a broader exploration for institution-specific interventions that can

provide supportive and protective factors for FGCS. Increasing the student's resiliency through programming and direct support from staff or faculty is crucial for FGCS (Allan et al., 2014; Hamdan-Mansour et al., 2014).

Substance use. Substance use, the fourth category of independent variables, likely increases students' risk for negative outcomes such as lower academic performance and increased dropout risk (Arria et al., 2013; Suerken et al., 2014), and our study supports this through H_{8a-d} . The four hypotheses demonstrated that students who use substances, such as cigarettes, $\text{Exp}(B) = 0.723$, $\text{Wald } \chi^2(1) = 25.67$, $p < .001$; vape pens, $\text{Exp}(B) = 0.745$, $\text{Wald } \chi^2(1) = 47.02$, $p < .001$; alcohol, $\text{Exp}(B) = 0.834$, $\text{Wald } \chi^2(1) = 25.67$, $p < .001$; or illicit substances including marijuana, $\text{Exp}(B) = 0.837$, $\text{Wald } \chi^2(1) = 22.87$, $p < .001$, are 16%–28% less likely to receive mostly A's, indicating a significant risk to academic success. A variety of factors need further exploration, such as a student's understanding of the risks associated with the substances they use, the frequency of use, and the underlying reasons for use. This study demonstrates the overall effect of substance use in negatively impacting students' academic success. Substance use could also indicate other negative mental health struggles, so colleges should remain vigilant. These findings indicate that, in addition to substance prevention supports that colleges offer, it is important to provide academic support to help students recover academically. The integration of academic supports, such as peer tutoring or faculty-led review sessions, with substance-free living communities and on-campus substance prevention groups may prove beneficial to students struggling with substance use. Additionally, integrating academic advisors within these communities may enable advisors to help students gain awareness of institution-specific supports that would improve their academic success.

Structural security. Ensuring that students' basic needs are met is extremely important to students' success and their ability to maintain positive mental health. Our study supports this through H_9 , which found that each additional hour worked per week decreases the likelihood of receiving mostly A's by 4.6%, $\text{Exp}(B) = 0.954$, $\text{Wald } \chi^2(1) = 14.60$, $p < .001$. However, when controlling for those number of hours, we found that a student's financial stress (H_{10}) and food insecurity (H_{11}) better explained their ability to succeed academically. Although it is still important to consider how the number of hours a student works impacts their academic success, it is more important to consider why they might be working more hours. Our study demonstrates that it is more impactful for a university to assist students by stabilizing their financial situation and ensuring that they have consistent access to food rather than policies restricting the number of hours a student may work at a university. This finding could even mean that allowing a student to work more hours might ultimately benefit the student's academic success. The benefit of stability in food and finances outweighs the negative impact of working more hours.

Other interventions that universities can offer need to be further researched, but a common theme in the current research is that destigmatizing food insecurity can help ensure that students actually seek assistance (Lopez, 2023). An institution may consider other interventions such as income-based costs for meal plans or grants and programs focused on helping students meet their basic needs. More research is needed to improve the equitable and sustainable access to financial and food resources that institutions offer.

LIMITATIONS AND STRENGTHS

This study has a few potential limitations concerning secondary data. First, the research evaluates archival data from the Healthy Minds 2020–2021 survey. Therefore, it cannot conclude causal relations from this research. Because the data was not assembled to answer a particular research question, they might differ from the data the researchers require. The researchers did not control and manipulate the variables that may have played a role. Similarly, another potential limitation is that the Healthy Minds records may include only some archives of complete responses. When the survival of records is selective, there is a possibility of bias in the remaining archival data. Finally, considering the time frame within which the survey was conducted, the researchers cannot rule out that the findings could be skewed by social, psychological, and environmental dynamics during the COVID-19 pandemic; therefore, researchers are encouraged to duplicate this study with postpandemic data.

Although the study has potential limitations, secondary data use also had several advantages. First, the archival research minimized participants' response bias because the researchers were not present while the data was recorded. The archival data was good quality, large, diverse, and convenient. This existence can facilitate different types of analysis and methods for evaluating the results. The archival research was effective in helping to confirm that the results and theories derived from the survey reflect the "real world" and do not just exist in artificial or simplistic settings. In doing so, this approach can help future researchers create new ideas for hypotheses.

RECOMMENDATIONS AND FUTURE RESEARCH

This study proposes several recommendations and areas for future research. First, it would be worthwhile to compare the Healthy Minds survey with other psychometrically reliable and valid campus surveys to ensure the validity and reliability of the findings. Second, potential research could explore in greater detail other important demographic variables such as race/ethnicity, socioeconomic status, and the number of college generations in the family system. Third, future research could explore how the type of educational setting impacts academic success. Are there differences between the type of institutions (i.e., community college, 4-year regional institutions, national institutions, or Carnegie status)?

Conclusion

Various variables influence students' academic success, and for colleges to effectively respond to these needs, they must identify their specific population's needs. Each campus culture has different strengths and growth areas, but there is a connection to how a campus can analyze its students' well-being. All of the hypotheses supported by this study indicate shared indicators that universities can develop their awareness of in order to best support their students' academic success. Through more effectively tracking of these quantifiable indicators, universities can allocate their resources more efficiently to improve their students' academic success.

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