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The Impact of Social Relationships on College Student Learning during the Pandemic: Implications for Sociologists

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Abstract

This article uses survey data gathered in fall 2020 and spring 2021 from students at a public, midwestern university to explore the factors affecting self-reports of learning during the pandemic. The consistent finding is that social relationships—support from professors and connections to peers—are critical. The impact of social relationships on learning is statistically significant even when other factors that have received much attention during the pandemic, including self-reports of mental health, technology access, and financial worries, are taken into account. The implications of these findings for our work as sociology teachers during and after the pandemic and for our departmental activities are highlighted.

Keywords

social relationships, learning, pandemic, sociology

In spring 2020, the COVID-19 pandemic led institutions of higher education in the United States to make an abrupt switch from traditional face-to-face learning to online learning. Even in fall 2020, over one half of U.S. colleges were either partly or primarily online (Dennon 2021). College and university students faced substantial disruptions to their normal social relationships with both their faculty and their peers. In addition, some students experienced mental health challenges heightened by social isolation, technical dilemmas associated with computer use, and financial hardship linked to job and income loss. Less attention has been given to issues of learning itself—to the factors associated with student perceptions of learning in the online environment occasioned by COVID-19.

This article uses data from samples of students at a public, midwestern university to explore the factors associated with self-reports of learning during the period when COVID-19 forced many classes to move online. The key finding is that isolation from the relationships developed at their university—the perception of the lack of support from faculty and the lack of connections with student peers—is a critical factor in understanding student perceptions of learning declines during the pandemic. The social context of learning, then, is as important or more important than the psychological, technological, and economic factors that have received so much attention in the popular and academic press. While such findings may not surprise teachers of sociology, they have significant implications for how we structure our work with students going forward.

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BACKGROUND

Social Relationships and Learning Prior to the Pandemic

Integration into college life is one of the chief predictors of student retention and degree completion. Studies demonstrate that it increases when "students felt that faculty and the broader institution cared about them and their well-being" and when "having on-campus friendships and attending campus events was normative" (Mayhew et al. 2016:540). Tinto's influential retention models focus on both academic integration—"measured by the students' grade performance and intellectual development"—and social integration—"measured by students' interaction with college society (peers and faculty)," suggesting that positive relationships with both faculty and peers are critical to a successful college experience (Aljohani 2016:6).

Astin's (1999) work focuses, in particular, on the importance of involvement and the role of student-faculty interactions in understanding both persistence and student learning. More broadly, out-of-class faculty interactions are associated with cognitive growth (Mayhew et al. 2016:541), although recent evidence is mixed (Mayhew et al. 2016:554). The role of relationships, including student-faculty relationships, is perhaps best highlighted in Chambliss and Takacs's (2014) research for *How College Works*. They argue that "college works when it provides a thick environment of constant feedback, driven by the establishment and maintenance of social relationships" (Chambliss and Takacs 2014:132). Similarly, students who report having a faculty mentor and supportive relationships with faculty express higher levels of confidence in their future and well-being after graduation (Crabtree 2019). Activities fostering social relationships are viewed as high-impact practices because research suggests that subject matter learning is associated with factors such as learning communities, small-group learning, and collaborative learning (AAC&U 2018; Mayhew et al. 2016:549).

While this literature emphasizes the importance of relationships, a tension exists in American culture between the emphasis on higher education as a public good as opposed to a private one (Drezner, Pizmony-Levy, and Pallas 2018; Pasquerella 2019). Traditionally, higher education gives precedence to individual student success, with individuals ranked on the basis of their achievement measured by their own GPA and scores on standardized tests. This contradiction between the individual and the collective is fertile ground for sociological study focused on the nature and importance of collegiate relationships, with an emphasis on learning itself. Furthermore, while much of the literature focuses on both student-to-student interaction and student-to-faculty interaction, it is useful to evaluate the importance of each type of relationship for its impact on student success.

Social Relationships and Learning in the Pandemic

Of course, with the pandemic-created transition to online learning during spring 2020, many college students found themselves in an all-online environment without forewarning and for the first time. The online environment itself—even without the overlay of the pandemic—creates challenges for sustaining meaningful social relationships. My own prepandemic study shows that sizeable majorities of students in online classes reported that they had less contact with professors and with fellow students than in traditional courses (Senter 2016). Pike and colleagues (2017), in their review of online learning in sociology, note that good teaching in the online environment includes student-faculty contact and cooperation among students. The faculty they interviewed about online teaching "were keenly aware that . . . they needed to recreate community through engagement strategies, such as discussion boards and group projects" (Pike et al. 2017:76–77)

For most students, the pandemic led to a disruption of their normal social lives as they were cut off from the kinds of collegiate social contact they had with both faculty and their student peers. Colleges closed residence halls, leading many students to move back to their parents' home. "Stay home, stay safe" orders meant that students could not socialize with friends and could not relax or combat stress in the social ways that they may have found useful in the past (e.g., working out at gyms, going to concerts). Numerous studies document that respondents reported loneliness and suffering from a lack of social interaction during the period of social distancing and social isolation (Filho et al. 2021; Reyes-Partillo et al. 2022; Son et al. 2020).

Some studies have focused explicitly on students' academic struggles during the pandemic (Ascione 2021) and with their reported declines in learning (Ezarik 2021; Hamlin and Barney 2022b). The pandemic created learning problems in part because students report difficulties staying

motivated in an online environment that lacks the social relationships found in a more normal campus setting (Means and Neisler 2020). Gillis and Krull (2020), in their widely cited *Teaching Sociology* article, report that having fewer opportunities for peer discussions was a barrier inhibiting academic success for students during the pandemic. Zhou and Zang (2021:15), while reporting positive experiences one year after initial COVID diagnoses, nonetheless indicate that "students reported the inadequate opportunities to interact with both teachers and peers was still the major challenge and barrier to their online learning." In their study of sociology faculty and students at the University of Michigan, Hess and colleagues (2022:8) found that "both instructors and students struggled with a lack of connection in the remote environment."

The pandemic provides us with something of a naturally occurring breaching experiment that allows us to explore the impact of social relationships on college student learning. We may glean larger lessons about the social context for learning when we observe the role it plays during a period of intense strain.

Other Factors Affecting Learning in the Pandemic Environment

To gauge the effect of social relationships sui generis, other factors affecting student learning during the pandemic must be taken into account explicitly.

Mental health. Perhaps the most prominent of these factors in both the popular and academic literature on the pandemic is mental health. While the psychological distress of American college students received considerable attention prior to the pandemic, the pandemic and its related stressors have exacerbated mental health concerns (AAC&U 2021; Ascione 2021; Kerr 2020; Lumpkin 2020; Son et al. 2020).

Disruptions in social relationships can play a role in mental health distress for college students. Reyes-Portillo and colleagues (2022) find that loneliness is one of the key correlates of deteriorating mental well-being. In fact, the negative changes in social life that have accompanied the pandemic have been linked to a wide range of mental and physical health concerns (Filho et al. 2021; Ray 2021).

Academic success during the pandemic can be undermined by such mental health challenges. Gillis and Krull (2020:293) note that a majority of students in their study "reported feeling less motivated due to mental health concerns and having trouble sleeping." Son and colleagues (2020) likewise find that the mental health challenges experienced by students are a key factor impeding students' academic success during the pandemic.

What is of particular interest here is whether social relationships have a direct impact on learning even when mental health status is explicitly considered in a multifactor model. We conceptualize students' self-reports of mental health as a mediator or intervening variable between social relationships and learning. Social relationships may affect learning but only because strained social relationships may negatively impact mental health, which may be the key factor affecting whether students report that they are learning successfully.

Access to technology and financial worries. The pandemic has also highlighted the continuing significance of the digital divide in the United States, with concerns about whether students from lower income backgrounds had computer access necessary to be successful in their online classes (Filho et al. 2021; Gillis and Krull 2020). Of course, the lack of access to technology can have immediate negative effects on learning and may negatively affect mental health as well. D'Agostino (2022:1), summarizing a recent Educause study, finds that even more than two years into the pandemic, more than three quarters of students faced at least one technology challenge, and "more than half (51 percent) reported that those challenges induced stress."

College students faced significant financial concerns (AAC&U 2021) linked to the pandemic and were also worried about their ability to find jobs after graduation and to pay back student loans (Anderson 2020; Ascione 2021; Hamlin and Barney 2022a; Kerr 2020). Such financial challenges can negatively affect student academic performance and well-being (Moore et al. 2021).

This research will provide a more complete analysis of reports of learning during the pandemic by explicitly including variables related to technological and financial concerns. These factors can have a direct effect on learning as well as possible indirect effects through their roles in enhancing or threatening mental health.

This article uses data from a fall 2020 sample of undergraduates at a public, midwestern university to explore the ways in which the COVID-19 pandemic affected students' reports of learning. The main focus is on the impact of collegiate social

relationships, taking into account self-reports of mental health, access to technology, and financial worries as well. It is critical to be able to explore the impact of social relationships explicitly and to separate their direct impact on learning independent of their association with mental health. Furthermore, this analysis focuses on both the effects of connections to peers and support from faculty on reports of learning. A smaller data set from spring 2021 allows for a replication of findings, although with a more limited number of variables. The implications of findings for sociology faculty and their departments are highlighted.

METHODOLOGY

The Samples

The more extensive data reported here come from an online survey administered to undergraduates at a midwestern, public university in fall 2020, the first full semester after the shift in March to online instruction. Virtually all classes at the institution were supposed to be available to students online.

Invitations were mailed to all 11,885 undergraduate students at the institution in late September, with three reminder messages posted subsequently. In the end, 2,977 students completed useable questionnaires, for a 25 percent completion rate. While the four undergraduate classes of freshmen to seniors were represented well in the sample of completed questionnaires, men and students of color were somewhat underrepresented.

A similar survey was administered one semester later in spring 2021 to students who had chosen majors in the university's college housing the humanities and social sciences. This college is one of six with undergraduate majors, so it is possible that some students who completed the fall questionnaire also completed the spring survey. While the second survey was designed to learn more about students' experiences with their major, key questions about learning, social relationships, and mental health during the pandemic were replicated from the university-wide fall survey. This second survey was sent to all 1,500 college majors in early March 2021. Three reminder notes were posted later in March. Data are available for analysis from 386 students, for a completion rate of 26 percent, with again a small overrepresentation of women and White students. Both surveys were determined to be not human subject research by Central Michigan University's Office of Research Compliance.

Measurement

The analysis here focuses on the following variables, only some of which were available in both surveys.

Self-reports of learning. Students were asked to report on their learning during the pandemic with two questions that were part of both the university-wide fall 2020 survey and the college-specific spring 2021 survey. The first question uses the Likert options of strongly agree, somewhat agree, somewhat disagree, and strongly disagree as responses to the statement: "I am learning as much this semester as I usually do." The second question asked about changes since the beginning of the pandemic (in March 2020) in the "Amount I have learned in classes." The response options are increased a lot, increased some, stayed the same, decreased some, and decreased a lot. These two variables, named the *constant learning* and *change in learning* variables, respectively, constitute the dependent variables for our analysis.

Social relationships. The Likert scale options were also provided in fall 2020 and spring 2021 to record responses to two statements about social relationships within the university. The statements are: "I feel supported by my professors" and "I feel connected to peers at [institution name]."

Mental health status. Students in both the fall and spring surveys were asked to indicate how much "my mental health" has changed since the beginning of the pandemic. The response options, ranging from increased a lot to decreased a lot, are the same as those used for the change in learning variable.

Technology access. Students in the fall survey were also asked to use the Likert response items to record the extent to which they agreed or disagreed with the statement: "I have access to the technology necessary to support the online portions of my classes."

Financial worries. Fall 2020 survey respondents were asked to indicate whether they have "experienced each of the following since the pandemic began (around March 2020): I have worried about not having enough money for tuition; I have worried about not having enough money for food; and I have worried about not having enough money to

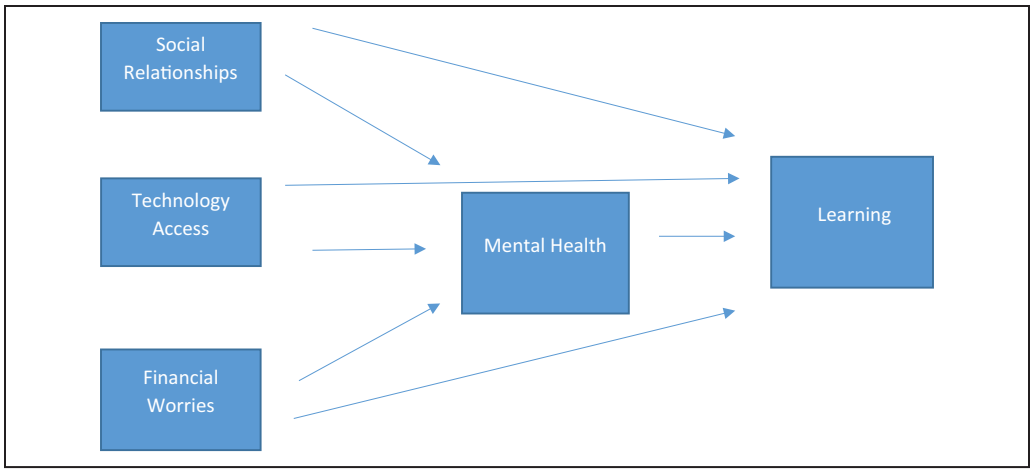

Figure 1. Model of the impact of social relationships and other factors on learning.

pay other bills such as rent." Responses were combined into a financial worry index that ranged from 0 to 3, counting affirmative responses to each of the three questions.

Race/ethnicity and gender. Given that the pandemic has heightened awareness of the impact of numerous dimensions of inequality on health and well-being, *race/ethnicity* and *gender* are used here as control variables. Students in both surveys were asked "Your racial/ethnic group," with the option to select as many as apply, and "Your gender," with the open-ended option "specify" if male/female was not appropriate (and specify and nonbinary for the spring survey). Racial/ethnic responses are dichotomized to 0 for White only and 1 for all other options (including African American, Asian, Hispanic, Native American/American Indian, and Pacific Islander/Hawaiian). The gender responses used here are 0 for male/man and 1 for female/women, given the small number of respondents choosing other options.

ANALYSIS

The analysis begins by providing a univariate description of the variables included here from the fall 2020 survey because each of the variables is of interest in its own right. The literature reviewed previously suggests that there are relationships among these variables, and these will be explored with a set of bivariate correlation coefficients and cross-tabultions from the university-wide fall data set.

To highlight the role of collegiate social relationships during the pandemic, we explore the role of these relationships on self-reports of learning net of the impact of the other factors that may also be associated with learning declines. We will be able to parse the separate and possibly differing relationships between learning and support from professors and learning and connections with peers. Given that social relationships may be relevant to students' mental health status but have no direct effect on learning, we begin by exploring the factors that are associated with students' reports of mental health declines. Then, we focus explicitly on factors linked to our two measures of learning—changes in learning and constant learning. The issue here is whether social relationships affect learning independently of perceptions of mental health, technology access, and economic distress. The conceptual model we are exploring is diagrammed as Figure 1. Multivariate analyses allow for an evaluation of these partial relationships.

Table 1 provides the percentage distributions summarizing the variables from the fall survey. The table shows that students believed that their learning suffered during the pandemic, with 71 percent reporting that their learning decreased some or a lot and 74 percent disagreeing somewhat or strongly that they were learning "as much as I usually do." Students' reports about their social relationships varied, with students feeling more isolated from student peers than from faculty. The percentage of students disagreeing somewhat or strongly when asked whether they felt connected to their peers at the institution was more than twice

Table 1. Experiences of Students during the COVID-19 Pandemic: Percentage Distributions from Fall 2020.

Self-report of learning						
	N	Increased a lot	Increased some	Stayed the same	Decreased some	Decreased a lot
Change in amount I have learned in classes	2,852	3.2	8.2	18.2	38.3	33.2
	N	Strongly agree	Somewhat agree		Somewhat disagree	Strongly disagree
I am learning as much as I usually do (constant learning).	2,845	6.4	19.5		30.9	43.3
Social relationships						
I feel supported by my professors.	2,844	24.4	45.0		20.9	9.7
I feel connected to peers at [institution name].	2,849	4.9	23.3		37.1	34.6
Mental health status						
	N	Increased a lot	Increased some	Stayed the same	Decreased some	Decreased a lot
Change in mental health	2,849	1.9	5.5	14.7	42.0	35.8
Technology access						
I have the technology necessary to support the online portion of my classes.	2,848	57.8	32.8		7.2	2.2
Financial worries						
	N	Checked	Not checked			
I have worried about not having enough money for tuition.	2,977	45.6	54.4			
I have worried about not having enough money for food.	2,977	29.3	70.7			
I have worried about not having enough money to pay other bills such as rent.	2,977	37.5	62.5			

that of the percentage disagreeing that they felt supported by their professors (72 percent vs. 31 percent, respectively).[1]

Consistent with prior research, but nonetheless alarming, more than three quarters of students (78 percent) indicated that their mental health has decreased some or a lot since the beginning of the pandemic. On the face of it, technology was not the key problem because relatively few students—slightly less than 10 percent—disagreed that they had the technology necessary to support the online portion of their classes. Financial worries were, however, common, with almost one half of students worried about having enough money to pay for tuition, almost 30 percent worrying about having enough money to pay for food, and three out

Table 2. Correlations among Student Experience Variables: Bivariate Correlation Matrix from Fall 2020.

	Change in learning	Learning as much as usual	Supported by professors	Connected to peers	Mental health change	Technology necessary
Change in learning	1.00					
Learning as much as usual	.64	1.00				
Supported by professors	.36	.45	1.00			
Connected to peers	.32	.45	.40	1.00		
Mental health change	.30	.33	.24	.28	1.00	
Technology necessary	.18	.25	.29	.22	.18	1.00
Financial worries	.12	.13	.14	.17	.20	.26

Note: All coefficients are statistically significant at $p < .001$.

of eight students worried about having enough money to pay other bills such as rent. The financial worry index that combines these three variables shows that 59 percent of students had at least one of these three financial concerns, and 18 percent indicated that they worried about all three financial issues.

Table 2 presents the bivariate correlation matrix of our variables, showing the interrelationships among them. While all of the correlation coefficients in Table 2 are positive and are highly statistically significant ($p < .001$), the discussion highlights the relationships involving social relationships and those that are of at least moderate strength (.30 or higher). As one would expect, the two measures of learning correlate highly ($r = .64$). Students who disagreed that they are learning as much as usual are also more likely to report a decrease in their learning since the pandemic began. Our two measures of collegiate social support are distinct but also moderately correlated with one another ($r = .40$). Students who felt connected to peers were also more likely to report support from professors and vice versa.

While the critical role of collegiate social relationships is summarized in Table 2 with the correlation coefficients, the percentages from the cross-tabulation help to bring these findings into sharp relief. Table 3 shows that almost three quarters (73 percent) of students who strongly disagreed about having support from faculty indicated that their learning decreased a lot compared to only about one eighth (13 percent) of those who strongly agreed that they had faculty support. Similarly, there is a 40-percentage-point difference in reporting steep learning declines between students who strongly disagreed that they were connected to peers and those who strongly agreed that they had those peer ties (52 percent vs, 12 percent, respectively). Similar results are found when focused on constant learning rather than change in learning. More than 85 percent of students who strongly disagreed that were supported by professors and almost 70 percent of students who strongly disagreed that they were connected to peers also strongly disagreed that they were learning as much as usual. By contrast, only 17 percent of students who strongly agreed that they have faculty support and only 9 percent of those who strongly agreed that they were connected to peers strongly disagreed that they are learning what is usual.

Data from Table 2 and Table 3 also demonstrate that social relationships are important to the maintenance of mental health. Fully 63 percent of students who strongly disagreed that they were supported by their professors reported a strong decline in mental health compared to only 24 percent of those who reported "strongly" that they received this support from faculty ($r = .24$). Similarly, 54 percent of students who strongly disagreed that they were connected to peers reported that their mental health decreased a lot compared to 19 percent who strongly agreed that they had those peer connections ($r = .28$).

Table 3. Crosstabulations of Self-Reports of Learning and Mental Health by Social Relationships: Percentages from Fall 2020.

Dependent variable	Social relationship	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
Amount I have learned decreased a lot[a]	Supported by professors	13.0	26.5	48.2	72.5
	Connected to peers	12.1	17.3	25.3	52.2
Strongly disagree that learning as much as usual[b]	Supported by professors	16.8	37.3	67.3	85.9
	Connected to peers	9.3	21.0	38.7	68.0
Mental health decreased a lot[a]	Supported by professors	23.8	32.2	44.9	63.0
	Connected to peers	19.3	22.2	29.9	53.7

[a]Chi-square statistics with $df = 12$ statistically significant at $p < .001$.
[b]Chi-square statistics with $df = 9$ statistically significant at $p < .001$.

The bivariate correlations show that students who indicated a decrease in their mental health were also more likely than others to report a decrease in their learning ($r = .30$ for change in learning; $r = .33$ for constant learning). Crosstabulations (available on request) show that more than one half of students who reported that their mental health decreased a lot (52 percent) compared to 21 percent of those who said that their mental health substantially increased reported that the amount they have learned in classes decreased a lot.

Table 4 for the fall sample and Table 5 for the spring sample clarify which variables are most important, net of the impact of the others, in explaining student reports of their mental health change given that we conceptualize mental health change as being a possible mediator variable in understanding self-reports of learning. Table 6 for the fall sample and Table 7 for the spring sample focus on self-reports of learning.

Findings from both ordinary least squares (OLS) regression and binary logistic regression analyses are reported in Tables 4 through 7. Logistic regression analyses address problems associated with the use of OLS for ordinal variables such as our self-reports of learning and mental health. For logistic regression, variables were dichotomized: Mental health and change in learning were recoded to no change/increase, and decrease and agree/disagree variables, including learning change, were recoded to agree/neutral and disagree. The variables are coded so that high scores represent negative (or low) outcomes—for example, decreases in learning or disagreement about connections to peers. Models including the important controls of race and gender are included as well.

Tables 4 through 7 present the standardized regression coefficients (or beta weights), *t* statistics, significance levels, and R^2s from the OLS. The beta weights allow for comparisons of the effect of the independent variable on the dependent variable because they (usually) range from 0 meaning no effect to 1 (or negative 1) denoting the strongest effect. R^2 measures the amount of variance in the dependent variable explained by the independent variables. Multivariate OLS regressions analyses were run with both weighted and unweighted samples to correct for gender bias.[2] While unweighted data are presented here, there is no substantive change in findings when data are weighted.

Tables 4 through 7 also provide the exponentiated b (listed as "exp(b)") or odds ratios, the Wald statistics, and the significance levels from the logistic regression analyses. The odds ratio can be interpreted as showing the increase (if above 1) or decrease (if below 1) in the likelihood of experiencing an outcome (e.g., a decrease in learning) given the occurrence of the independent variable (e.g., lacking support from faculty). The Nagelkerke R^2s (pseudo-R^2s), which measure the goodness of fit of the logistic regression models, are also presented.

Table 4 shows that five variables available for fall 2020 have a statistically significant relationship with perceptions of changes in mental health in both the multivariate OLS and logistic regression models.[3] Students who disagreed that they felt supported by professors were more likely to report

Table 4. Regression of Changes (Decreases) in Mental Health by Social Relationships, Access to Technology, Financial Worry, and Control Variables for Fall 2020.

	Standardized regression coefficient *t* statistic (significance level)	Standardized regression coefficient *t* statistic (significance level)	Odds ratio [exp(b)] Wald statistic (significance level)[a]
(Constant)	—	—	.068
	44.097	37.258	59.708
	(<.001)	(<.001)	(<.001)
Supported by professors	.127	.134	1.892
(disagree)	6.449	6.629	25.600
	(<.001)	(<.001)	(<.001)
Connected to peers	.194	.186	2.215
(disagree)	9.997	9.344	59.959
	(<.001).	(<.001)	(<.001)
Access to technology	.067	.072	2.906
(disagree)	3.544	3.697	14.715
	(<.001)	(<.001)	(<.001)
Financial worry index	.129	.122	1.270
	7.031	6.423	25.772
	(<.001)	(<.001)	(<.001)
Race (students of color)	—	–.023	.907
		–1.247	.484
		(.212)	(.487)
Gender (female)	—	.122	1.995
		6.770	43.272
		(<.001)	(<.001)
R^2	.123	.135	.133[b]

[a]All variables dichotomized.
[b]Nagelkerke R^2.

Table 5. Regression of Changes (Decreases) in Mental Health by Social Relationships and Control Variables for Spring 2021.

	Standardized regression coefficient Wald statistic (significance level)	Standardized regression coefficient *t* statistic (significance level)	Odds ratio [exp(b)] Wald statistic (significance level)[a]
(Constant)	—	—	1.441
	17.468	13.348	1.185
	(<.001)	(<.001)	(.276)
Supported by professors	.179	.172	3.885
(disagree)	3.368	3.091	4.615
	(<.001)	(.002)	(.032)
Connected to peers	.245	.240	2.470
(disagre)	4.600	4.307	10.758
	(<.001)	(<.001)	(<.001)
Race (students of color)	—	–.052	.624
		–1.000	2.313
		(.318)	(.128)
Gender (female)	—	.077	1.475
		1.485	1.310
		(.138)	(.252)
R^2	.125	.127	.117[b]

[a]All variables dichotomized.
[b]Nagelkerke R^2.

Table 6. Regression of Self-Reports of Learning (low) by Social Relationships, Mental Health, Access to Technology, Financial Worry, and Control Variables for Fall 2020.

	Change in learning (decrease)			Learned as much as usual (disagree)		
	Standardized regression coefficient *t* statistic (significance level)	Standardized regression coefficient *t* statistic (significance level)	Odds ratio [exp(b)] Wald statistic (significance level)[a]	Standardized regression coefficient *t* statistic (significance level)	Standardized regression coefficient *t* statistic (significance level)	Odds ratio [exp(b)] Wald statistic (significance level)[a]
(Constant)	—	—	.065	—	—	.003
	19.670	19.334	94.738	10.313	10.209	365.313
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Supported by professors	.239	.224	3.064	.283	.285	5.019
	12.594	12.457	83.879	16.257	15.859	262.401
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Connected to peers	.162	.158	2.011	.268	.267	3.163
	8.581	8.168	51.516	15.437	14.986	105.788
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Mental health change	.186	.185	2.299	.179	.189	2.404
	10.390	9.975	63.345	10.841	11.084	51.315
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Access to technology	.035	.028	1.540	.079	.073	1.728
	1.939	1.513	4.778	4.713	4.258	11.092
	(.053)	(.130)	(.029)	(<.001)	(<.001)	(<.001)
Financial worry index	.011	.024	1.074	–.012	–.013	1.082
	.639	1.311	2.841	–.727	–.786	3.679
	(.523)	(.190)	(.092)	(.467)	(.432)	(.055)
Race (students of color)	—	–.063	.654	—	.006	1.115
		–3.624	11.439		.381	.715
		(<.001)	(<.001)		(.703)	(.398)
Gender (female)	—	–.031	.932	—	–.045	.823
		–1.750	.448		–2.801	3.533
		(.080)	(.503)		(.005)	(.060)
R^2	.201	.205	.176[b]	.326	.331	.307[b]

[a]All variables dichotomized.
[b]Nagelkerke R^2.

decreases in their mental health, as were those who disagreed that they were connected to peers at the institution. Similarly, students who disagreed that they had the technology necessary for the online portion of their classes and those who worried about financial bills for essential items were more likely than others to report that their mental health declined since the beginning of the pandemic. Female students were also more likely to report a decline in mental health. About one eighth of the variance in perceptions of mental health change is explained by the variables included in the OLS models: The R^2 in the models including the demographic controls is .135 and is .123 for the model without race and gender. Key findings are replicated with the spring 2021 data presented in Table 5. The Nagelkerke R^2s are comparable.

Table 6 indicates that the five-variable OLS model without the demographic control variables explains about 20 percent of the variation in perceptions of change in learning ($R^2 = .201$), with the OLS model explaining almost one third of the variation in views about whether learning is constant ($R^2 = .326$). The two social relationship variables continue to have a statistically significant relationship with both measures of learning, with students who disagreed that they were supported by professors and students who disagreed that they had peer connections being the ones to report learning decreases or that they are not learning as much as usual. The associations between collegiate social relationships and learning are *not spurious* with mental health serving as the mediator because the associations continue even when self-reports of

Table 7. Regression of Self-Reports of Learning (low) by Social Relationships, Mental Health, and Control Variables for Spring 2021.

	Change in learning (decrease)			Learned as much as usual (disagree)		
	Standardized regression coefficient *t* statistic (significance level)	Standardized regression coefficient *t* statistic (significance level)	Odds ratio [exp(b)] Wald statistic (significance level)[a]	Standardized regression coefficient *t* statistic (significance level)	Standardized regression coefficient *t* statistic (significance level)	Odds ratio [exp(b)] Wald statistic (significance level)[a]
(Constant)	—	—	.474	—	—	.360
	8.981	8.495	4.228	3.038	3.003	7.340
	(<.001)	(<.001)	(.040)	(.003)	(.003)	(.007)
Supported by professors	.247	.241	3.865	.253	.251	5.348
	4.826	4.461	8.277	5.039	4.766	11.090
	(<.001)	(<.001)	(.004)	(<.001)	(<.001)	(<.001)
Connected to peers	.213	.238	2.378	.214	.227	2.332
	4.102	4.361	12.656	4.208	4.248	11.804
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Mental health	.164	.113	1.845	.198	.183	2.702
	3.288	2.146	4.984	4.043	3.558	11.958
	(<.001)	(.033)	(.026)	(<.001)	(<.001)	(<.001)
Race (students of color)	—	–.049	.949	—	.037	1.377
		–.992	.032		.766	1.123
		(.322)	(.858)		(.444)	(.289)
Gender (female)	—	–.017	1.005	—	–.034	.753
		–.349	.000		–.703	.750
		(.727)	(.988)		(.482)	(.386)
R^2	.217	.204	.168[b]	.245	.242	.225[b]

[a]All variables dichotomized.
[b]Nagelkerke R^2.

mental health are taken into account. Furthermore, students who report declines in mental health also report learning problems—both decreases in learning and disagreement that they are learning as much as usual.

The relationships between access to technology and the two learning variables are statistically significant in the logistic regression models, and technology access is linked to one measure of learning in the OLS regression models. However, the standardized regression coefficient is small—less than .10. Our measure of financial worry is not statistically significant in any of these multivariate models. The association between race and gender and learning is inconsistent across measures and models.

The available data from spring 2021 found in Table 7 are comparable to those presented previously. A lack of support or connection from professors and peers, respectively, and reported decreases in mental health are associated with both declines in learning and the perception of not learning as much during the pandemic as usual. The pseudo-R^2s from the logistic regression models are similar to those from the OLS models.

CONCLUSIONS AND IMPLICATIONS FOR SOCIOLOGISTS

The data presented here clearly demonstrate the association between positive collegiate social relationships and learning. Social relationships continue to have an independent effect on perceptions of learning in both samples, and this effect is not simply mediated by the links between social isolation and mental health dilemmas. Regardless of mental health perceptions, students who reported feeling a lack of faculty support and peer connections were more likely than better connected students to report that the amount they are learning has declined or that they are not learning as much as usual. Isolated students are also more likely than those who feel support from faculty and

connections to peers to report decreases in their mental health during the pandemic. These data suggest that students benefit from a rich environment of social connections. Relationships between students and faculty are critical, as are those among student peers.

These findings in no way suggest that students are unaffected by financial worries or by the lack of technology access. Rather, these factors may have negative consequences for students because they are part of the constellation of factors associated with mental health challenges.

Our findings have clear implications for sociologists and their departments, and I highlight four of these in the following.

Commitment to Collecting and Using Data on Student Relationships and Needs

While these findings from one university have implications for others, there are advantages to collecting data locally—on your home campus. Sociology faculty, given interests in integrating data analysis and methods throughout the curriculum (Pike et al. 2017), might consider working with sociology students in classes or through independent study projects to develop surveys, qualitative interviews, or focus groups to learn more about the importance of social relationships on their own campuses and about their own students' needs. Students might develop a better understanding of and interest in both empirical evidence and social relationships if the data they collect and analyze are from their peers and if the "real world" implications of their efforts are immediately apparent.

I have discussed elsewhere (Senter 2017) the ways in which such data collecting efforts can be integrated into semester-long classes—enhancing student learning and providing useful and actionable data on the study body. Such data, whether collected by individual faculty members or associated with student projects, can be widely shared on campus, showcasing both the utility of sociology and promoting decision-making sensitive to the ways that students' social relationships are linked to their collegiate success.

Academic and Co-curricular Experiences to Promote Social Relationships and Student Success

While hiring more staff at university counseling centers is one approach for addressing students' mental health challenges, fiscal realities constrain how much additional hiring is possible. An alternative approach is to strengthen collegiate social relationships through the enhancement of curricular and co-curricular experiences—aspects of university life about which faculty have some measure of control. The sociology curriculum provides multiple opportunities for this kind of development that has the potential of enhancing both learning and mental health.

Cornerstone or onboarding classes have been shown to assist students in moving successfully from the introductory course to more advanced coursework in the major (Holtzman 2018). Such classes can also be structured to help students understand the role of social relationships and social context in fostering or undermining their well-being. Explicit attempts to highlight concepts such as stereotype threat, tokenism, and the strength of weak ties may be especially useful to students who face the social relationship, mental health, and financial challenges discussed previously, making their academic success more difficult. Creating cohorts of undergraduate students who experience courses in common, including cornerstone classes for majors, might strengthen peer-to-peer social relationships and also link students to a faculty member who is supportive of their learning.

Other sociology courses may also be especially appropriate venues for such social relationship and community building. Certainly, classes that explicitly focus on group dynamics, intergroup dialogue, or community-based research necessarily bring the study and practice of social connections to the forefront.

In addition, institutions can work to enhance both face-to-face and virtual co-curricular events that connect students because we cannot assume that the current generation of students—savvy as they may be with social media—can create a rich and meaningful social world on their own. The need for student-to-student involvement, as Astin (1999) and others (Aljohani 2016) note, is important for student retention and for student learning. Sociology departments can contribute to these initiatives by developing or promoting sociology clubs or the international sociology honorary society Alpha Kappa Delta.

A Pedagogy of Connection and Caring

A series of articles published in *Teaching Sociology* since 2020 implicitly, if not explicitly, highlights

the ways in which faculty-student and student-student relationships have been challenged during the pandemic and need to be strengthened going forward to promote student success. Gillis and Krull (2020) stress the importance of prompt and regular communication from faculty to students in the online environment, document the advantages of faculty reaching out to students periodically for their suggestions on improving courses, and note that creating opportunities for peer connections seems to reduce academic barriers for students. Hess and colleagues (2022) highlight the advantages of synchronous (rather than asynchronous) online instruction for building community among students and faculty.

The "ethics of care pedagogy" championed by feminist scholars suggests that more sustained emphasis needs to be placed on the necessarily dependent relationships between students and faculty (Monchinski 2010). Such a focus on caring sees faculty-student relationships as broader than the impersonal, bureaucratic exchange of a letter grade for performance by students, lacking a life outside of the classroom, on class assignments. Such an orientation may be critical if one goal is to counter the isolating and possibly alienating competitive and individualistic mentality that is associated with aspects of higher education, generally, and may be especially useful as we emerge from the multiple disruptions of the pandemic. Chambliss and Takacs (2014) point out how simple acts of caring by faculty can lead to substantial long-term benefits for individual students and their institution.

Recent articles in *Teaching Sociology* are consistent with this view about the need not just for relationship building but also for caring. Bartholomay (2022:64) encourages a commitment to compassion in working with pandemic-stressed students, which "can be understood as an awareness of the suffering of others coupled with a desire to relieve it." Hess and colleagues (2022) have documented an increased emphasis on care among faculty even at a prominent Research I institution. Similarly, Coleman (2022) highlights a series of best practices that sociology faculty can employ to assist students in coping with stresses exacerbated by the pandemic. Wynn and colleagues (2023) highlight the sociological role of empathy in the classroom.

While modern systems of communication may make some of this effort easier than it was in the past, the importance of having sufficient time for the task cannot be discounted. This is especially the case given that recent research confirms that junior faculty, women, and faculty of color assume disproportionate amounts of this often uncompensated and critical care work (Berheide, Carpenter, and Cotter 2022). Certainly, as sociologists, we need to recognize and credit work in fostering care relationships in tenure and promotion decisions.

Resisting the Negative Effects of Fiscal Constraints on Relationship Building and Student Success

The pandemic has created substantial financial strains for many institutions of higher education, as costs increased and tuition and auxiliary revenue (from units such as housing and sports) declined. In fact, even prior to the pandemic, institutions were facing fiscal pressures, and some embraced a neoliberal, market-based model to reduce costs. As Lucal (2015) pointed out in *Teaching Sociology*, the neoliberal turn in higher education has led to larger class sizes and to the requirement that tenure-track faculty spend more time on bureaucratic report writing for accountability purposes, giving them less time to spend creating supportive relationships with students. Adjunct faculty, hired in increasing numbers as a cost-cutting measure, may have strong interests in relationship building with students, but heavy teaching loads and appointments on multiple campuses make it difficult to develop the kinds of long-term relationships that students most need. Current pressures in higher education for auditing faculty productivity and student learning using quantitative measures may contribute to an undervaluing of the human and social dimensions of higher education, a point stressed by Chambliss and Takacs (2014).

Declining financial support for higher education has led to increases in tuition and fees. As sociologists, we should be pleased that our field attracts disproportionate numbers of first-generation college students and students of color (ASA 2022); however, we must continually recognize the financial and technology challenges that some of our students and college students, more generally, face. Increasing state support for higher education, reducing student loan burdens, and increasing need-based financial aid would help alleviate these financial concerns. Sociology faculty have some ability to control student expenses by being sensitive to textbook costs and using low-cost or no-cost materials whenever possible, as Bartholomay (2022) and Francis, Hill, and Overmier (2022) note. While technology access is important for all

online classes, sociology faculty who teach data analysis and research methods using software such as SPSS, STATA, or NVivo might need to be especially proactive in anticipating and addressing student technology access.

As sociologists, we recognize the importance of organized collective action to try to reverse the cost-cutting turn in higher education and restore more adequate funding to colleges and universities. We can increase our involvement in the shared governance units on our campuses (whether that be as members of academic senates, faculty unions, or AAUP chapters) to heighten awareness of the challenges facing students when decisions are made that save money in the short term but threaten collegiate relationships. We can engage with the formal political system, individually and with our professional associations, to advocate for increased resources for higher education to reduce students' financial worries that diminish mental health and to support strong collegiate relationships that have the potential both to increase student learning and their mental well-being.

Limitations of This Research

There are, of course, limitations to the research presented here. The fall data are drawn from one institution and the spring data from one college. The response rates for our surveys, while typical, are lower than one would like, and men and students of color are underrepresented in the samples. These sampling issues limit the ability to generalize to the broader college student population. Self-report data are problematic in their own ways becuase it is possible that students have actually learned more than they acknowledge. Furthermore, the aforementioned suggestions, for sociologists and for departments, assume a causal sequence among the variables that cannot be confirmed with these cross-sectional data.

A Research Agenda for Sociologists in the Future

Sociologists have a critical role to play by conducting research in the postpandemic world that focuses more on the impacts of faculty-student and student-student relationships. The data presented here were gathered at an important but unique period within higher education. Future research needs to explore whether findings can be replicated when colleges and universities primarily offer face-to-face classes and, in addition, when remote learning is the dominant modality on campuses but there are no major health crises that encourage social distancing. While not the main focus of this research, additional work needs to explore the ways in which students' identities, including race, gender, LGBTQ+ status, disability status, and social class background, affect their learning postpandemic and the roles that faculty play in enhancing—or detracting from—learning.

Much additional research needs to explore what exactly students mean when they report that they feel supported by faculty. Is such support primarily emotional and independent of course content, or are supportive faculty ones who provide explicit academic support? While cynical faculty might argue that students feel supported only when they receive high grades for minimal work, there is no reason to believe that most students are so one-dimensional. The world of online teaching makes this especially important because some of the more conventional approaches to show support outside of class meeting times—for example, an open door in the hallway—need to be reimagined in the virtual world. In addition, the increasing diversity of the college student body, generally, and of sociology majors, specifically, suggests a need to capture what may be the multiple ways that diverse groups of students think about support and encouragement. For example, asking a professor for help may have a different emotional overlay for a student of color who is worried about stereotype threat than for a White student. Semistructured qualitative interviews are presumably preferable to quantitative surveys for capturing such important and nuanced data.

Student self-reports of substantial decreases in learning since the pandemic began are troubling in their own way. Understanding more about why and when students report that they are not learning as much as they usually do is a pressing issue for higher education. Online learning is not going to disappear from higher education, although COVID-19 may become less challenging. A key goal is to draw lessons from the crises of the pandemic to excite students about learning. To do so most effectively, we need diverse samples of students and institutions to understand the ways that social relationships (and other factors) promote learning both in the virtual world and in a face-to-face postpandemic world, where students and faculty meet without masks and yardsticks to measure the physical distance between them.

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NOTES

1. Majorities of students in spring 2021 from the humanities and social sciences college reported learning declines, although the percentages are lower than from the fall university-wide sample. Fifty-three percent of the spring sample disagreed that they are learning as much as usual, and 58 percent said that their learning decreased since the pandemic began. Seventy percent of students in spring indicated support from professors, and only 24 percent reported connections to peers. The percentage of students who reported decreases in their mental health continued to be high in the spring at 75 percent.
2. Weighting to adjust for racial/ethnic nonresponse bias is not possible given that the university's operationalization of race/ethnicity differs substantially from the operational definitions used in the surveys.
3. Standard tests for multicollinearity—the variance inflation factor and tolerance—show no problems in the OLS models.

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