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ORIGINAL ARTICLE

# Predictors of close faculty–student relationships and mentorship in higher education: findings from the Gallup–Purdue Index

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College students' supportive relationships with mentors—professors, advisors, and other caring adults to whom students turn as they develop their interests and career paths—are critical to their development and academic success. The current study sought to explore factors that promote or impede the formation of positive mentor–student relationships during college using a large, nationally representative sample of 5,684 college graduates from the Gallup–Purdue Index. Linear regression models revealed that first-generation college students, as well as students attending larger institutions, rated faculty and other college staff as less caring and supportive, and were less able to identify a supportive mentoring relationship during college. Greater engagement at college, including participation in faculty research, academic internships, long-term projects, and extracurricular clubs or activities, was associated with stronger perceptions of faculty support and mentorship while in college. Interestingly, demographic characteristics moderated the effects of some extracurricular activities on students' experiences. For example, participants with more student loans showed a stronger positive association between participation in long-term academic projects and perceptions of faculty support, relative to students with few loans. These findings have important implications for policies designed to foster sustained and meaningful faculty–student relationships for all students, including those traditionally marginalized on college campuses.

**Keywords:** faculty–student relationships; natural mentoring; higher education; Gallup–Purdue

## Introduction

The relationships, experiences, and knowledge that students gain during the college years can fundamentally shape their lifetime personal and career outcomes.<sup>1–3</sup> Supportive relationships with mentors—professors, advisors, and other caring adults at college to whom many students turn as they develop their interests and career paths—have been identified as a key aspect of the college experience critical to young adults' development and academic success.<sup>1,2,4–6</sup> Students who report more interaction with college faculty members, for example, tend to show greater social integration into the college setting and better academic performance.<sup>7–9</sup> Furthermore, a nationally representative survey of over 30,000 college graduates found that the ability

to identify one adult mentor at college predicted greater work engagement and subjective well-being in the years after college.<sup>1,2</sup>

Mentors likely influence college students' success in numerous ways. Adjustment to college and the transition to adulthood more broadly represent a time characterized by elevated rates of turmoil and risk, as youth begin to achieve new levels of independence, while also making important decisions about their social lives and careers.<sup>10,11</sup> Mentors can help to offset this risk during the college years by providing encouragement and guidance, helping students navigate the identity issues inherent in the crucial transition to adulthood and opening doors to educational and career opportunities.<sup>12,13</sup> These benefits of mentoring appear to be particularly strong for underrepresented or academically at-risk

college students.<sup>8</sup> For these students, on-campus mentors can serve as institutional agents who provide guidance through the challenges of adjusting to college life by helping them understand and adapt to the academic rigors of college, while also translating cultural values and social rules that can seem esoteric.<sup>4,14</sup> Indeed, evaluations of college-based interventions for first-generation, low-income, and ethnic minority students show that supportive relationships between underrepresented students and faculty help to demystify confusing institutional systems,<sup>15</sup> promote students' sense of belonging,<sup>14,16</sup> and facilitate academic and social adjustment to college.<sup>17</sup>

Given the ability of supportive relationships between students and professors, advisors, and other caring adults at college to offset risk and support a healthy transition to adulthood, there is growing interest in identifying factors that encourage their formation. To date, few studies have examined the student and institutional characteristics that promote or impede the formation of mentoring relationships in college. Most of the existing research has been conducted with relatively small, homogenous samples and within single colleges, making it difficult to compare findings across institutions and student groups. Moreover, studies often examine outcomes associated with mentoring relationships, without exploring variables that influence the likelihood of developing these supportive relationships. However, research on naturally occurring mentoring relationships across a range of other school and community settings suggests several broad categories of factors that might foster this type of close, intergenerational relationship at colleges and universities.

First, a variety of youth demographic characteristics appear to predict access to naturally occurring mentors. Most notably, youth from lower socioeconomic backgrounds tend to be less likely to identify a natural mentor within their social networks during late adolescence and young adulthood.<sup>18</sup> Financial stress can also impede the formation of informal student–faculty interactions, in part by contributing to burdensome off-campus work obligations and part-time or sporadic enrollment.<sup>7</sup> Additionally, low-income students are more likely to have parents who have not attended college, and may lack familiarity with institutional norms, while feeling less entitled to faculty time and attention.<sup>19,20</sup>

In contrast to the literature on socioeconomic background, evidence regarding the impact of race and ethnicity on faculty–student interaction is mixed. Some studies show elevated rates of minority student–faculty communication regarding certain topics, such as course-related material, but much lower rates of engagement in other areas, such as faculty-related research.<sup>21,22</sup> Moreover, non-White students report less satisfying relationships and greater experiences of discrimination from faculty members,<sup>23</sup> noting that their cultures tend to be undervalued or ignored by college staff, which can, in turn, lead to disengagement of these students from the college community.<sup>24</sup>

Another set of factors that have been linked to the promotion of mentoring relationships at school across developmental stages involves student engagement in extracurricular activities, such as clubs, sports, and research extending beyond coursework.<sup>25,26</sup> These ongoing, goal-oriented activities that occur outside of the classroom may provide unique opportunities for extended student–faculty interactions around shared interests,<sup>3,9,27–29</sup> although few studies have specifically tested the link between extracurricular engagement and the promotion of mentoring relationships among college students. Nevertheless, one qualitative study found that students who reported more extensive contact with faculty identified extracurricular activities, particularly scholarship and research programs, as primary support structures that facilitated faculty–student contact.<sup>19</sup> Moreover, mentors who help students focus on a substantive project, such as conducting research, learning a new skill, or collaborating on a particular area of activism, appear to be particularly influential on student outcomes more generally.<sup>5,30</sup>

Compared with these academically oriented extracurricular activities, the evidence for benefits associated with athletic participation is more mixed.<sup>31</sup> In a qualitative study of collegiate sports, some athletes discussed ways in which sports participation improved their academic engagement, while others discussed times in which it interfered with their academic performance owing to the time commitment required.<sup>32</sup> Furthermore, collegiate sports may offer more limited opportunities to engage with adults, particularly academic faculty, relative to extracurricular activities with a more academic focus.

In addition to student background characteristics and extracurricular engagement, a college or university's size and structure is likely to be a crucial factor in promoting faculty–student interaction. Smaller colleges tend to have lower student–faculty ratios and place a greater emphasis on undergraduate teaching, thereby increasing the likelihood of meaningful student–faculty interactions.<sup>7,33,34</sup> Smaller colleges are also less likely to have large, lecture-based classes, in which students, particularly those from underrepresented backgrounds, tend to report fewer interactions with professors.<sup>35,36</sup> These findings suggest that smaller colleges might provide a better structure for the extended interactions required to foster faculty–student mentorship; yet, this question has not been directly studied.

### Current study

Data from the Gallup–Purdue Index,<sup>2</sup> which gathered information from a large, nationally representative sample of students who graduated from colleges and universities across the United States between 2000 and 2015, were used to identify factors associated with positive relationships between students and their professors, advisors, and other caring adults during college. Analyses tested three clusters of student characteristics hypothesized to influence the likelihood of connecting with caring adults at college: student demographic characteristics, such as socioeconomic status and race/ethnicity; student engagement in extracurricular activities, such as faculty-sponsored research, student clubs, or collegiate sports; and institution size. Outcomes included two items designed to assess to what extent each student agreed that they had a close relationship with a mentor at college, and whether students generally felt that faculty cared about them as people while in college. We hypothesized that racial/ethnic minority, lower-income, and first-generation college students would agree less that they had a mentor in college who encouraged them to pursue their dreams, and would have lower perceptions of caring and support from faculty, relative to their peers. In addition, we hypothesized that greater engagement in each of the extracurricular activities, as well as smaller institution size, would predict greater perceptions of mentorship, as well as caring and support from faculty, in college.

In addition to examining the main effects of these three clusters of variables on each outcome, we also conducted exploratory analyses to test whether demographic characteristics moderated the influence of extracurricular engagement and institutional size on each outcome. Past research has shown that access to naturally occurring mentors in certain contexts might depend on background variables, such as socioeconomic status and race/ethnicity.<sup>18,37</sup> For example, evidence suggests that youth from socioeconomically disadvantaged backgrounds are less likely to develop natural mentoring relationships with teachers, in particular.<sup>6,18,37</sup> However, when mentoring relationships with teachers do form, they may have a particularly potent impact on the educational outcomes of racial/ethnic minority and lower-class youth, while influencing the educational trajectories of more privileged youth less strongly or not at all.<sup>14,37</sup> As such, it is possible, for example, that engagement in internships or faculty research yields a mentoring relationship with a faculty member more often for White or upper-class students than for their less privileged peers. Likewise, a larger institution size may be less likely to influence perceptions of how caring faculty are among White or higher-income students, who enter college equipped with resources to find mentors even in larger institutions.

### Methods

#### *Participants and procedure*

Analyses utilized data from the Gallup–Purdue Index, which consists of web-based survey data from college graduates. Participants were recruited from two sources. First, the Gallup Panel consists of a proprietary, probability-based sample of U.S. adults selected via random-digit-dial and address-based sampling methods. Second, the Gallup Daily Tracking Panel is a sample recruited by random-digit-dial (50% cellphone and 50% landline respondents), with minimum quotas by time zone within region. Gallup Panel and Gallup Daily Tracking Panel members who were aged 18 or older, living in a U.S. state or the District of Columbia, had an associate's or bachelor's degree, and had internet access were invited to participate. Interviews were conducted online in English and asked participants to report on demographic variables, aspects of the college experience, and current life circumstances and well-being.

The current study utilized a sample of respondents who completed the survey in 2015 and graduated from college between 2000 and 2015 ( $N = 5684$ ). The average age of the sample was 36.1 years ( $SD = 10.9$ ) at the time of the interview. Almost half of the sample (49.5%) identified as female. The majority of the sample (82.0%) identified as White, with the remainder identifying as Black (7.2%), Hispanic (6.3%), Asian (3.6%), or another race (0.9%).

### Measures

**Demographic characteristics.** Participants were asked to report on a range of demographic characteristics, including their race, their parents' level of education, and the amount of student loans they borrowed to complete their undergraduate degrees. For the purpose of analyses, two dichotomous variables were created: one variable indicating whether or not participants identified as a member of any minority racial group (versus identified as white, non-Hispanic), and one variable indicating whether the participant was a first-generation college student. In addition, the amount of student loans was used as a proxy for financial need<sup>38</sup> and was coded on a scale from 0 to 4 (0 = \$0; 1 = \$1–\$10,000; 2 = \$10,001–\$20,000; 3 = \$20,001–\$40,000; and 4 = \$40,001 or more).

**Extracurricular engagement.** Participants were asked to retrospectively report on various extracurricular activities they engaged in while attending the college or university from which they obtained their undergraduate degree. They indicated whether or not they had participated in NCAA intercollegiate sports, intramural sports, student clubs or organizations, and research with a professor or faculty member. Additionally, on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree), participants responded to two items that assessed the extent to which they worked on an academic project that took a semester or longer to complete, and had an internship or job that allowed application of concepts learned in the classroom.

**Institutional size.** Participants provided the name of the college or university from which they obtained their undergraduate degrees. Researchers created a variable indicating each institution's size during the participants' graduation year (1 = less than 5,000 students; 2 = 5,000–9,999 students;

3 = 10,000–19,999 students; and 4 = 20,000 or more students).

**College mentoring relationships.** Participants were asked to report the sources and levels of support they received while attending the college or university from which they obtained their undergraduate degrees. On a 5-point scale (1 = strongly disagree and 5 = strongly agree), participants rated the extent to which they agreed with the following statements: "While attending [College or University Name] I had a mentor who encouraged me to pursue my goals and dreams," and "My professors at [University Name] cared about me as a person."

**Covariates.** Two covariates were included in all models. First, the student's decade of graduation (2000–2009 or 2010–2015) was included, in order to control for any cohort effects on the outcomes. Second, gender was included as a covariate, given some evidence that females report mentoring relationships at higher rates across adolescence and young adulthood.<sup>27,37</sup>

### Analytic procedures

Two sets of linear regression models were used to examine the three domains of predictor variables (i.e., student demographic variables, student extracurricular engagement, and institution size) as predictors of each outcome variable. In addition, for each outcome, a single model with all three sets of predictors was run to determine the relative strength of these predictors. Finally, we conducted exploratory analyses to test whether demographic characteristics moderated the influence of extracurricular engagement and institutional size on each outcome. All other predictors were also included as covariates in each of these interaction models. In all analyses, the data were weighted to match national demographics of gender, age, race, education, Hispanic ethnicity, and region.

### Results

Descriptive statistics and bivariate correlations for key study variables are presented in Table 1. A total of 4,406 participants (78%) provided complete information for models about having a mentor while in college, and 4,402 (77%) provided complete information for all variables in models about perceptions of caring and supportive faculty.

**Table 1. Descriptive statistics and bivariate correlations among independent variables and covariates**

Variable	Mean (SD)	Range	Freq. (%)	1	2	3	4	5	6	7	8	9	10	11	12
1. Research with faculty	-	0-1	44.3	-	<b>0.37</b>	<b>0.15</b>	<b>0.05</b>	<b>0.10</b>	<b>0.22</b>	0.02	0.002	<b>-0.09</b>	<b>0.04</b>	0.02	0.01
2. Semester-long project	3.52 (1.58)	1-5	-	-	-	<b>0.32</b>	<b>0.04</b>	<b>0.10</b>	<b>0.19</b>	<b>0.03</b>	<b>-0.06</b>	<b>-0.08</b>	<b>0.03</b>	<b>-0.03</b>	<b>-0.07</b>
3. Internship/job	3.31 (1.59)	1-5	-	-	-	-	0.02	<b>0.09</b>	<b>0.13</b>	<b>-0.04</b>	-0.02	-0.02	0.01	<b>0.03</b>	-0.02
4. NCAA athletics	-	0-1	6.1	-	-	-	-	<b>0.17</b>	<b>0.09</b>	0.01	<b>-0.03</b>	<b>-0.06</b>	-0.02	<b>-0.04</b>	<b>-0.13</b>
5. Intramural athletics	-	0-1	25.0	-	-	-	-	-	<b>0.29</b>	-0.005	<b>-0.08</b>	<b>-0.18</b>	-0.02	<b>-0.21</b>	-0.001
6. Club/organization	-	0-1	55.1	-	-	-	-	-	-	0.02	0.01	<b>-0.19</b>	<b>0.04</b>	-0.01	0.02
7. Undergraduate loans	1.68 (1.59)	0-4	-	-	-	-	-	-	-	-	<b>0.07</b>	<b>0.14</b>	<b>0.07</b>	<b>0.04</b>	<b>-0.12</b>
8. Ethnic/racial minority	-	0-1	18.0	-	-	-	-	-	-	-	-	<b>0.07</b>	<b>0.05</b>	<b>0.06</b>	<b>0.05</b>
9. First-generation student	-	0-1	40.2	-	-	-	-	-	-	-	-	-	-0.01	<b>0.06</b>	<b>-0.09</b>
10. Decade of graduation	-	7-8	32.4	-	-	-	-	-	-	-	-	-	-	-	<b>-0.03</b>
11. Female	-	0-1	49.5	-	-	-	-	-	-	-	-	-	-	-	<b>-0.05</b>
12. Institutional size	2.80 (1.24)	1-4	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: Bold type denotes  $P < 0.05$ .

*Predicting perceptions of access to mentorship in college*

Results for models predicting college graduates' perceptions of having a mentor while in college are presented in Table 2. In domain-specific models for demographic predictors, first-generation college students had lower rates of agreement that

they had a mentor during college, over and above the effects of gender and decade of graduation, while undergraduate loans (our proxy for lower family income) and racial minority status did not predict college mentorship. However, it should be noted that in the larger model accounting for all predictors, first-generation college student status

**Table 2. Domain-specific and overall models predicting participants' perceptions that, "While attending [college or university Name] I had a mentor who encouraged me to pursue my goals and dreams"**

Predictor	Domain-specific models						Overall model					
	$\beta$	<i>b</i>	SE	<i>P</i>	CI	VIF	$\beta$	<i>b</i>	SE	<i>P</i>	CI	VIF
<b>Demographics</b>												
Undergraduate loans	0.00	0.00	0.01	0.77	-0.03 to 0.02	1.03	-0.02	-0.02	0.01	0.09	-0.05 to 0.00	1.05
Racial/ethnic minority	-0.02	-0.07	0.05	0.12	-0.17 to 0.02	1.02	0.00	0.00	0.04	0.95	-0.09 to 0.09	1.04
First-generation student	-0.08	-0.22	0.04	<0.001	-0.31 to -0.14	1.03	-0.03	-0.09	0.04	0.03	-0.17 to 0.01	1.09
<b>Activities</b>												
Research w/ faculty	0.10	0.27	0.04	<0.001	0.20 to 0.35	1.20	0.09	0.26	0.04	<0.001	0.18 to 0.34	1.20
Semester-long project	0.21	0.19	0.01	<0.001	0.16 to 0.21	1.28	0.19	0.17	0.01	<0.001	0.14 to 0.20	1.30
Internship/job	0.21	0.19	0.01	<0.001	0.17 to 0.21	1.13	0.21	0.19	0.01	<0.001	0.17 to 0.22	1.13
NCAA athletics	0.05	0.29	0.07	<0.001	-0.15 to 0.44	1.03	0.05	0.29	0.08	0.31	0.12 to 0.45	1.06
Intramural athletics	0.01	0.05	0.04	0.26	-0.03 to 0.13	1.16	0.01	0.03	0.05	0.50	-0.06 to 0.13	1.17
Student club/organization	0.15	0.43	0.04	<0.001	0.35 to 0.50	1.16	0.15	0.44	0.04	<0.001	0.36 to 0.53	1.17
<b>Institution</b>												
Institutional size	-0.13	-0.15	0.02	<0.001	-0.18 to -0.12	1.00	-0.10	-0.12	0.02	<0.001	-0.15 to -0.09	1.05
<b>Covariates</b>												
Female							0.05	0.15	0.04	<0.001	0.07 to 0.22	1.06
Decade of graduation							0.06	0.19	0.04	<0.001	0.11 to 0.26	1.02

NOTE: The overall model included all predictors and covariates. Domain-specific models are those in which each cluster of predictors (i.e., demographics, activities, and institutional size) was run without any other predictors, except for the covariates (female and decade of graduation). As such, three separate domain-specific models were run and are demarcated above. Coefficients, SE, *P*, CI, and VIF for the two covariates are not listed for domain-specific models because they varied slightly across each model.

**Table 3. Domain-specific and overall models predicting participants’ perceptions that, “My professors at [University Name] cared about me as a person”**

Predictor	Domain-specific models						Overall model					
	$\beta$	<i>b</i>	SE	<i>P</i>	CI	VIF	$\beta$	<i>b</i>	SE	<i>P</i>	CI	VIF
<b>Demographics</b>												
Undergraduate loans	−0.01	0.00	0.01	0.66	−0.03 to 0.02	1.03	−0.03	−0.02	0.01	0.04	−0.05 to 0.00	1.05
Racial/ethnic minority	−0.03	−0.09	0.04	0.03	−0.17 to 0.03	1.02	−0.01	−0.03	0.04	0.47	−0.11 to 0.05	1.04
First-generation student	−0.04	−0.09	0.04	0.01	−0.02 to 0.04	1.03	−0.03	−0.06	0.04	0.08	−0.14 to 0.01	1.09
<b>Activities</b>												
Research w/ faculty	0.07	0.18	0.04	<0.001	0.11 to 0.24	1.20	0.07	0.18	0.04	<0.001	0.11 to 0.26	1.20
Semester-long project	0.14	0.11	0.01	<0.001	0.08 to 0.13	1.28	0.13	0.10	0.01	<0.001	0.08 to 0.12	1.30
Internship/job	0.14	0.11	0.01	<0.001	0.09 to 0.13	1.13	0.14	0.10	0.01	<0.001	0.08 to 0.13	1.13
NCAA athletics	0.04	0.18	0.07	0.007	0.05 to 0.32	1.03	0.01	0.07	0.07	0.34	−0.07 to 0.22	1.06
Intramural athletics	0.01	0.03	0.04	0.42	−0.05 to 0.11	1.16	0.00	0.00	0.04	0.94	−0.08 to 0.09	1.17
Student club/organization	0.05	0.12	0.04	0.001	0.05 to 0.19	1.16	0.06	0.16	0.04	<0.001	0.08 to 0.23	1.17
<b>Institution</b>												
Institutional size	−0.19	−0.19	0.01	<0.001	−0.21 to −0.17	1.00	−0.18	0.18	0.01	<0.001	−0.21 to −0.15	1.05
<b>Covariates</b>												
Female							0.07	0.12	0.04	0.001	0.09 to 0.23	1.06
Decade of graduation							0.05	0.16	0.04	<0.001	0.05 to 0.19	1.02

NOTE: The overall model included all predictors and covariates. Domain-specific models are those in which each cluster of predictors (i.e., demographics, activities, and institutional size) was run without any other predictors, except for the covariates (female and decade of graduation). As such, three separate domain-specific models were run and are demarcated above. Coefficients, SE, *P*, CI, and VIF for the two covariates are not listed for domain-specific models because they varied slightly across each model.

was no longer a statistically significant predictor of reports about having a mentor in college.

In both models, almost all of the college engagement variables, including working on a long-term project for more than one semester, engaging in research with faculty, having an internship or a job that allowed application of classroom concepts, and participation in NCAA athletics and student clubs or organizations, predicted greater perceptions of having a mentor while in college. However, participation in intramural sports had no relationship to college mentoring in either model.

Finally, analysis of the role of institution size showed that identification with having a mentor during college decreased as the size of the student’s college or university increased.

*Predicting perceptions of caring and supportive faculty*

Table 3 shows results for models predicting participant perceptions of caring and supportive faculty. Similar to models predicting college mentoring relationships, analysis of demographic predictors revealed that racial or ethnic minority and first-

generation students reported significantly lower perceptions of caring and support from faculty in domain-specific models, with no effects observed for undergraduate loans. Again, in the larger model accounting for all covariates, the student demographic variables were no longer statistically significant predictors of perceptions about faculty support.

Almost all of the college engagement variables, including working on a long-term project for more than one semester, engaging in research with faculty, having an internship or a job that allowed application of classroom concepts, and participation in NCAA athletics and student clubs/organizations predicted greater perceptions of faculty supportiveness. By contrast, participation in intramural sports showed no relationship with perceptions of faculty support. In the larger model accounting for all covariates, all of these indicators of student extracurricular engagement, except for participation in NCAA or intramural athletics, remained statistically significant predictors of perceptions about faculty support.



**Table 4. The moderating role of racial or ethnic minority status on the impact of extracurricular and institutional factors in predicting perceptions of faculty support and mentorship**

Interaction term	Perception of having had a mentor					Perception of faculty care				
	$\beta$	<i>b</i>	SE	<i>P</i>	CI	$\beta$	<i>b</i>	SE	<i>P</i>	CI
Research × Minority	0.001	0.002	0.09	0.99	−0.18 to 0.18	0.02	0.07	0.08	0.39	−0.09 to 0.22
Project × Minority	0.04	0.04	0.03	0.16	−0.01 to 0.09	0.05	0.03	0.02	0.16	−0.01 to 0.08
Internship × Minority	0.05	0.04	0.03	0.14	−0.01 to 0.09	0.04	0.03	0.02	0.25	−0.02 to 0.07
NCAA × Minority	0.02	0.26	0.22	0.23	−0.17 to 0.69	0.02	0.19	0.19	0.32	−0.18 to 0.56
Intramural × Minority	0.05	0.34	0.11	0.003	0.12 to 0.56	0.02	0.09	0.10	0.34	−0.10 to 0.29
Club × Minority	0.005	0.02	0.09	0.84	−0.16 to 0.20	−0.01	−0.03	0.08	0.74	−0.18 to 0.13
Institution size × Minority	0.04	0.04	0.04	0.28	−0.03 to 0.11	0.07	0.06	0.03	0.06	−0.003 to 0.12

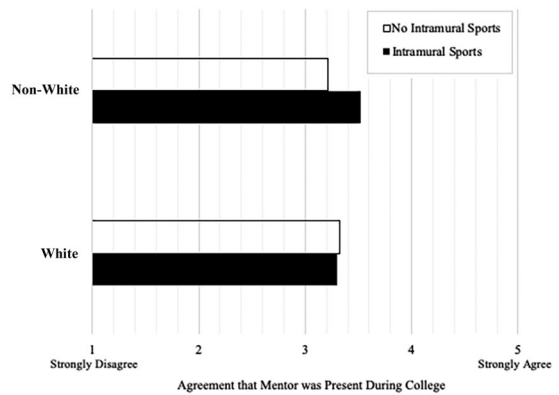
NOTE: Each interaction term was run in a separate model. Each model also included the following predictors: student gender and decade of graduation; student demographic characteristics (i.e., undergraduate loans, racial/ethnic minority status, and first-generation status); student engagement with extracurricular activities (i.e., research with a faculty member, semester or longer project, internship/job, NCAA athletics, and student club/organization); and institution size. Only interaction term statistics are presented here, but full model results are available upon request.

Finally, again consistent with models of student access to mentors during college, students attending larger institutions identified faculty as less caring and supportive.

*The moderating role of student demographics*

Next, models were run to examine whether each student demographic characteristic interacted with college engagement and institutional factors to predict the presence of mentoring relationships during college and overall student perceptions of faculty support.

**Racial or ethnic minority status.** Results for the interaction term from each model examining the moderating role of racial or ethnic minority status are presented in Table 4. When predicting the level of agreement that one had a mentor in college, minority status significantly moderated the impact of engaging in intramural sports. Simple slopes analyses indicated that there was a positive relationship between engagement in intramural sports and perceptions of college mentorship for racial minority students ( $b = 0.31$ ,  $SE = 0.10$ ,  $P < 0.01$ ), but this relationship was not present for nonracial minority students ( $b = -0.03$ ,  $SE = 0.05$ ,  $P = 0.55$ ; see Fig. 1). Racial or ethnic minority status did not moderate the impact of any other student engagement or institution variables on the identification of a mentor during college or perceptions of caring and supportive faculty.



**Figure 1.** The interaction between racial/ethnic minority status and intramural sports engagement in predicting college graduates' identification of a mentoring relationship during college.

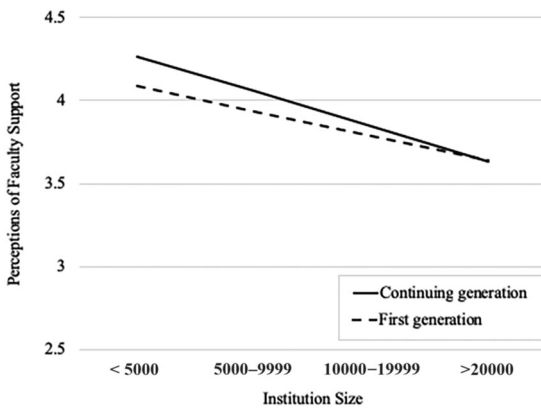
**First-generation college student status.** First-generation college student status moderated the effects of institution size on perceptions of faculty caring and support, such that first-generation college students showed a less negative association between institution size and perceptions of faculty support ( $b = -0.15$ ,  $SE = 0.02$ ,  $P < 0.001$ ), relative to students who had a parent who had attended college ( $b = -0.21$ ,  $SE = 0.02$ ,  $P < 0.001$ ; see Fig. 2). No other interactions emerged from this set of analyses for either outcome (Table 5).

**Student loans.** Student loan status significantly moderated the effects of an internship or a job

**Table 5.** The moderating role of first-generation college student status on the impact of extracurricular and institutional factors in predicting perceptions of faculty support and mentorship

Interaction term	Perception of having had a mentor					Perception of faculty care				
	$\beta$	<i>b</i>	SE	<i>P</i>	CI	$\beta$	<i>b</i>	SE	<i>P</i>	CI
Research × First Generation (FG)	0.02	0.09	0.08	0.26	−0.07 to 0.25	−0.01	−0.04	0.07	0.61	−0.18 to 0.10
Project × FG	0.03	0.02	0.02	0.33	−0.02 to 0.07	0.01	0.004	0.02	0.85	−0.04 to 0.05
Internship × FG	0.02	0.01	0.02	0.63	−0.04 to 0.06	0.06	0.04	0.02	0.09	−0.01 to 0.08
NCAA × FG	0.01	0.07	0.18	0.71	−0.29 to 0.42	0.001	0.001	0.15	0.99	−0.30 to 0.30
Intramural × FG	0.02	0.14	0.10	0.17	−0.06 to 0.34	0.005	0.02	0.09	0.80	−0.15 to 0.20
Club × FG	−0.01	−0.05	0.08	0.53	−0.21 to 0.11	−0.01	−0.03	0.07	0.65	−0.17 to 0.11
Institution size × FG	−0.01	−0.01	0.03	0.87	−0.07 to 0.06	0.08	0.06	0.03	0.03	0.01 to 0.12

NOTE: Each interaction term was run in a separate model. Each model also included the following predictors: student gender and decade of graduation; student demographic characteristics (i.e., undergraduate loans, racial/ethnic minority status, and first-generation status); student engagement with extracurricular activities (i.e., research with a faculty member, semester or longer project, internship/job, NCAA athletics, and student club/organization); and institution size. Only interaction term statistics are presented here, but full model results are available upon request.



**Figure 2.** The interaction between first-generation college student status and institution size in predicting college graduates' perceptions of faculty support and caring during college.

that allowed application of classroom concepts on graduates' perceptions of having had a mentor in college. Simple slopes analyses showed that students with higher levels of loans showed a stronger positive association between internship or job experiences and college mentorship, relative to students with lower levels of loans (e.g., for students with loans between \$20,001 and \$40,000, or roughly one standard deviation above the mean for the sample:  $b = 0.21$ ,  $SE = 0.02$ ,  $P < 0.001$ ; for students with no loans, or roughly one standard deviation below the mean for the sample:  $b = 0.16$ ,  $SE = 0.02$ ,  $P < 0.001$ ; see Fig. 3). In addition, when predicting perceptions of faculty caring and support, there was a significant

interaction between student loans and participation in a semester-long project, such that participating in an academic project that took a semester or longer to complete predicted greater perceptions of faculty caring and support more strongly for students with larger loans (e.g., between \$20,001 and \$40,000:  $b = 0.11$ ,  $SE = 0.01$ ,  $P < 0.001$ ), than for students with lower loans (e.g., \$0 in loans:  $b = 0.07$ ,  $SE = 0.02$ ,  $P < 0.001$ ; see Fig. 4). Student loans did not moderate any other student engagement variables or institution size for either outcome (full model results are presented in Table 6).

### Discussion

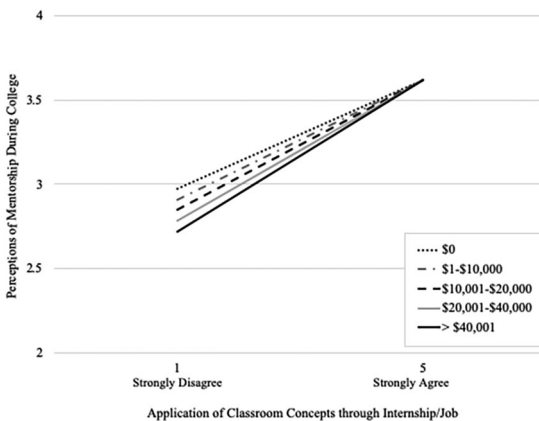
To our knowledge, this is the first study to examine demographic and institutional-level factors that predict student perceptions of close faculty–student relationships and access to mentorship during college in a large, nationally representative sample. The most robust predictors of perceived faculty support and mentorship were indicators of extracurricular engagement. Specifically, in both domain-specific and overall models, participation in research with a faculty member, having a job or an internship that allowed for the application of classroom learning, completing a long-term academic project, and participation in student clubs/organizations were associated with stronger perceptions of faculty support and connection to mentorship while in college. With respect to involvement with sports activities, participation in NCAA athletics predicted access to mentorship in



**Table 6.** The moderating role of student loans on the impact of extracurricular and institutional factors in predicting perceptions of faculty mentorship and care

Interaction term	Perception of having had a mentor					Perception of faculty care				
	$\beta$	<i>b</i>	SE	<i>P</i>	CI	$\beta$	<i>b</i>	SE	<i>P</i>	CI
Research $\times$ Loans	0.02	0.02	0.03	0.45	−0.03 to 0.07	0.01	0.01	0.02	0.71	−0.03 to 0.05
Project $\times$ Loans	0.07	0.01	0.01	0.07	−0.001 to 0.03	0.08	0.01	0.01	0.03	0.002 to 0.03
Internship $\times$ Loans	0.07	0.02	0.01	0.04	0.001 to 0.03	−0.01	−0.002	0.01	0.76	−0.01 to 0.01
NCAA $\times$ Loans	−0.01	−0.03	0.05	0.53	−0.13 to 0.07	0.02	0.05	0.04	0.30	−0.04 to 0.13
Intramural $\times$ Loans	−0.003	−0.004	0.03	0.88	−0.06 to 0.05	0.04	0.05	0.03	0.07	−0.003 to 0.10
Club $\times$ Loans	0.01	0.01	0.03	0.60	−0.04 to 0.06	0.03	0.02	0.02	0.27	−0.02 to 0.07
Institution size $\times$ Loans	0.05	0.01	0.01	0.17	−0.01 to 0.03	0.01	0.003	0.01	0.76	−0.01 to 0.02

NOTE: Each interaction term was run in a separate model. Each model also included the following predictors: student gender and decade of graduation; student demographic characteristics (i.e., undergraduate loans, racial/ethnic minority status, and first-generation status); student engagement with extracurricular activities (i.e., research with a faculty member, semester or longer project, internship/job, NCAA athletics, and student club/organization); and institution size. Only interaction term statistics are presented here, but full model results are available upon request.



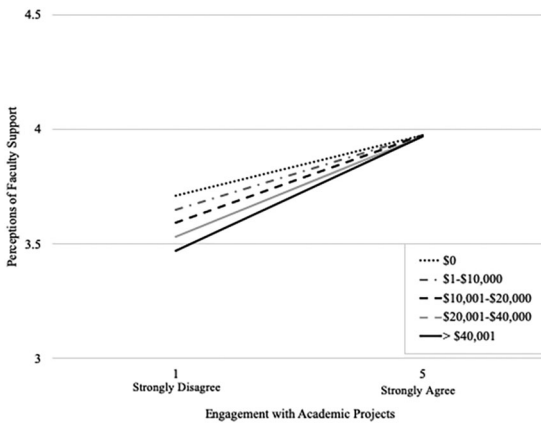
**Figure 3.** The interaction between initial student loan size and involvement in an internship or job that allowed application of classroom concepts in predicting college graduates' identification of a mentoring relationship during college.

both domain-specific and overall models, as well as greater perceptions of faculty support in domain-specific models, although these effects were smaller than other extracurricular activities. Participation in intramural sports did not predict either outcome.

These findings suggest that certain extracurricular activities might be more relevant than others for fostering close student–faculty relationships. In particular, academically oriented activities, such as participating in faculty research, engaging with long-term academic projects, and completing an academically relevant job or internship were the most robust and consistent predictors of faculty–student

mentorship and support. These findings support theories that suggest that extended student–faculty interaction that occurs outside of the classroom and that involves shared interests is key to building close student–faculty relationships.<sup>27–29</sup> On the other hand, engagement with athletics may be less likely to foster relationships with faculty and other potential mentors on campus, depending on the context. Participation in structured NCAA athletics had consistent, though relatively small, effects on students' reports of receiving mentoring while in college, and also predicted greater perceptions of faculty support when institution size and student demographics were not included as covariates in the model. This finding is consistent with research indicating that after-school sports can play a key role in connecting younger children to potential mentors.<sup>26,39</sup> By contrast, participation in intramural sports did not predict perceptions of faculty or the formation of close mentoring bonds while in college. Intramural sports are primarily student-run activities, with relatively little involvement from faculty and staff. College students have finite time and energy, and it is possible that engagement in peer-oriented activities, while potentially beneficial to peer relations, does not necessarily present opportunities to connect with faculty or other caring adults on college campuses.

In addition to extracurricular engagement, student demographics appeared to play a role in student perceptions of faculty support and mentorship. When only demographics were considered,



**Figure 4.** The interaction between initial student loan size and engagement with long-term academic projects in predicting college graduates' perceptions of faculty support and caring during college.

first-generation students were less likely to endorse having a close and supportive relationship with a mentor while in college, and first-generation and racial minority status were both associated with lower perceptions of faculty support and caring, aligning with evidence suggesting that underrepresented students face obstacles to accessing naturally occurring mentoring relationships.<sup>18,37,40</sup> However, models including the full set of predictors suggested that demographic variables were not predictive of mentoring relationships or perceptions of faculty support when covarying for the effects of extracurricular activities and institution size. These findings suggest that extracurricular involvement and institution size play a relatively greater role in accounting for variability in faculty-student relationships. Moreover, it is possible that ethnic minority and first-generation students might struggle to connect with college faculty and staff, in part, because of greater difficulties engaging fully in extracurricular activities that promote mentoring relationships, owing to factors such as time and financial constraints,<sup>7</sup> a lower likelihood of living in on-campus housing,<sup>41</sup> or a lack of a sense of entitlement around seeking out one-on-one faculty interaction.<sup>20</sup>

Student demographic characteristics also moderated the effects of several extracurricular activities on faculty-student relationships. First, results revealed that there was a more positive association between participation in intramural sports and

reports of having a mentor in college for racial minority students, compared with White students. Although these analyses were exploratory and findings should be interpreted with caution, it is possible that deep engagement with extracurricular activities, even those that are primarily peer-oriented, signals a greater sense of social belonging on campus for some marginalized students.<sup>42</sup> This greater social belonging might, in turn, promote greater motivation to seek out relationships with caring adults among these students.<sup>43,44</sup> Moderation analyses also revealed that participation in an academic project that took a semester or longer to complete predicted greater perceptions of faculty support more strongly for students with higher loan amounts (our proxy for students' family income). Likewise, students with higher loan amounts showed a stronger association between engagement in internship or job experiences that allowed application of concepts learned in the classroom and perceptions of having had a college mentor. These findings suggest that structured opportunities to interact with peers and professors outside of the classroom might be especially important to students holding marginalized identities. Since heavy debt burdens may force students to prioritize jobs that are not academically relevant over engagement in unpaid internships and other out-of-class academic opportunities, institutions should find ways to compensate students for academic- and career-related engagement (e.g., via work-study mechanisms or paid research opportunities). Nevertheless, it is also important to note that student loan size is an imperfect indicator of marginalization as a function of low family income. Loan sizes are also influenced by factors such as tuition amount, which varies widely across schools. These findings should, therefore, be considered exploratory, and future research should more precisely determine the ways that students' financial resources may affect their engagement with extracurricular activities and connection to caring adults on college campuses.

In addition to extracurricular engagement and student demographic variables, the university context also appears to be important; greater institution size was consistently the strongest predictor of lower perceptions of faculty caring and support, and also a robust predictor of lower ratings of access to mentorship during college. This finding is consistent with previous research suggesting that smaller

colleges create an environment more conducive to faculty–student relationships due to a greater focus on undergraduate teaching and smaller class sizes.<sup>7,33,34</sup> Of note, greater institution size appeared to be less problematic for first-generation college students. Again, these analyses of potential moderators of the effects of institution size were exploratory and should be interpreted with caution, as well as targeted for replication in future research. However, it is possible that bigger schools tend to have larger cohorts of underrepresented students, and are therefore more likely to have programs and policies in place to support these students. Large schools also tend to have more diverse faculty,<sup>45</sup> who may be more likely to form close bonds with diverse students. Future research should also examine additional characteristics of institutions that may be driving these findings. For example, institution size is often correlated with the type of institution (e.g., private, liberal arts institution versus large, research-oriented institution), and this may be a factor that also influences students' level of extracurricular engagement and faculty orientation toward mentoring undergraduates.

It should be noted that our analyses cannot prove a causal link between factors like extracurricular engagement and faculty–student bonding owing to the cross-sectional nature of the data. Previous qualitative and quantitative work has consistently identified extracurricular activities as a key context in which students are able to form close and supportive relationships with faculty,<sup>26,39</sup> suggesting that this is a plausible interpretation of our findings. Nevertheless, it is also possible that variables not assessed in our study, such as student personality or achievement orientation, influence both their likelihood of extracurricular participation and positive engagement with faculty. Furthermore, although the use of retrospective survey methods allowed us to ask college graduates to reflect on adults who were particularly important to their college experiences, this approach is also vulnerable to a number of reporting biases (e.g., poor memory for college experiences and negative mood contributing to biased memories of past experiences). In addition, relationships between extracurricular participation and faculty–student relationships are likely reciprocal, with faculty mentors connecting students to various research and professional opportunities. Additional research utilizing longitudinal methods, including

multiple assessments of student engagement and perceptions of social support that begin prior to matriculation, is necessary to fully disentangle the dynamic interrelationships among these constructs.

There were also several limitations inherent in our measurement of faculty–student relationships. In order to collect data from such a large sample, the brevity of assessment instruments was crucial. Supportive relationships with caring adults were therefore assessed using two items that focused on students' self-reports of having a mentor during college and their perceptions of whether faculty cared about them as a person. However, these items do not provide contextual information essential to more fully understanding faculty–student mentoring relationships. For example, the mentoring relationships remembered by college graduates may very well have been relationships with older peers on campus (e.g., teammates and peers in Greek organizations), or with adults from their home communities (e.g., extended family members and high school teachers). Data from a Strada–Gallup Survey showed that approximately two-thirds of college graduates who agree or strongly agree with this statement about having a mentor who encouraged the pursuit of goals and dreams identify the mentor as a college professor.<sup>46</sup> Nevertheless, for up to one-third of college graduates, this item may not be accurately capturing information about fostering close relationships between students and college faculty or staff. Moreover, this same item asked about mentors who encouraged the students to pursue their goals and dreams. Although this is surely one important role of mentors during college, it will be essential for future studies to assess the diverse functions that a mentor can have for a young adult, including emotional support and more mundane practical support around navigating life on a college campus.

Students' perceptions of faculty support and caring were also tested as a way to assess students' attitudes toward faculty, a construct that likely reflects, at least in part, faculty attitudes toward mentoring, as well as students' sense of belonging on campus and orientation toward seeking mentorship from faculty; however, this item still does not directly capture whether each student could identify a faculty mentor on campus. Future investigations should collect more detailed information about the specific kinds of mentoring support provided by college faculty and other adults on college

campuses, as well as how, when, and where students meet them. Quantitative path modeling, as well as in-depth qualitative research, should examine the processes by which these mentoring relationships impact students' psychosocial and academic well-being. Finally, students may have multiple naturally occurring mentors, simultaneously or sequentially, and research should, therefore, account for more complex webs of social support during one's time in college.<sup>14</sup>

Despite these limitations, our findings contribute to a growing body of literature on naturally occurring mentoring relationships during college, and their impact on student success. The use of a large, nationally representative dataset allowed us to draw conclusions that are likely more generalizable to all college students in the United States, relative to studies that derive their samples from faculty-student interactions at a single college or university. Findings suggest that extracurricular activities, particularly those that are academically oriented, are closely tied to supportive interactions between students and college staff, and that these extracurricular activities may be particularly important for fostering faculty-student relationships within underrepresented student groups. Colleges and universities should, therefore, work to expand the availability and accessibility of high-impact extracurricular activities for all students. For example, to alleviate the time and financial constraints on underrepresented students, colleges and universities can expand programs that offer students course credit for participating in faculty research or academically oriented internships. Large institutions, which appear to be less conducive to mentoring relationships between faculty and undergraduates, might consider increasing the availability of faculty appointments focused on undergraduate teaching, and more systematically incentivize and reward faculty for engaging in mentoring activities throughout hiring and tenure or promotion guidelines.<sup>47</sup> Finally, these extracurricular opportunities tend to be more readily available to more advanced students, but colleges and universities should consider adapting them to serve first-year students, given that early contact with faculty is associated with close relationships throughout college.<sup>27,48</sup>

In addition to these institution-level changes, research should continue to develop and evaluate interventions that aim to improve students' ability

to recruit and maintain mentors at college, with a particular emphasis on programs designed for students coming from underrepresented backgrounds. As one example, the Connected Scholars Program involves a structured curriculum that teaches first-generation college-bound students tangible networking skills that empower them to identify and recruit mentors while in college.<sup>49,50</sup> In qualitative and quasiexperimental evaluations, students who participated in the program before entering their first year of college demonstrated a greater appreciation for the importance of seeking help, improved relationships with college course instructors, and a higher grade point average at the end of the first semester of college.<sup>49,50</sup>

Research should continue to explore these diverse approaches to fostering sustained and meaningful mentoring relationships for students, both through institutional policies and interventions that target students' attitudes and social skills. Our findings indicate that such research could help to promote naturally occurring mentoring relationships, particularly for marginalized students, thereby expanding the scope and equitable distribution of mentoring relationships at college.

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## Author contributions

E.B.R. collaborated on study design, oversaw data analysis and interpretation, wrote the first draft of the manuscript, and coordinated draft revisions. D.L. conducted data analyses and accepts responsibility for the integrity of the data. J.E.R. and M.H. collaborated on the study design and contributed to drafts of the manuscript. All authors read and approved the final manuscript.

## Competing interests

The authors declare no competing interests.

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