Examining Sense of Belonging Among Freshmen College of Agriculture Students

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Abstract

Universities have consistently struggled with undergraduate student retention. However, one variable that has been shown to be an important factor related to undergraduate retention and success has been college student sense of belonging. The purpose of this study was to examine freshmen students' perceived sense of belonging to the University of Arkansas and the College of Agricultural, Food, and Life Sciences. First-year freshmen at the University of Arkansas (n = 233) were asked to provide responses on a survey measuring perceived sense of belonging, peer support, faculty support, empathy of faculty, class comfort, and isolation. Results showed respondents generally had a strong sense of belonging to the university and college of agriculture. Most students perceived faculty to be empathic and understanding, but also reported slightly lower levels of comfort when seeking help. Most students were neutral in perceptions of classroom comfort, meaning they may be less confident speaking in class, volunteering ideas, asking questions, and contributing to discussions. Just over half agreed they had peer support, while about a third perceived feeling isolated. Peer support, faculty support, and empathetic faculty were all predictors of sense of belonging in the college. Recommendations include using cooperative learning activities and continuing to provide opportunities for student organization participation to help students establish a sense of belonging.

Keywords: sense of belonging, college of agriculture, freshman retention

Colleges of agriculture have been tasked with supplying the agricultural industry with a pipeline of graduates who can address the global challenges associated with feeding a growing world population (Association of Public and Land-grant Universities [APLU], 2009; STEM Food & Ag Council, 2014). However, Fernandez et al. (2020) projected that over the next several years, there will be a shortage of qualified agricultural graduates to fill the available employment opportunities within the industry. One of the challenges with producing graduates has been low retention among undergraduate students, which has been a persistent

problem for institutions of higher education (Reason, 2009). Reports have shown that nearly a quarter of new college freshmen did not return for their sophomore year (Gardner, 2022), and only 64% of students who began a college degree finished within six years (National Center for Education Statistics, 2022). Within colleges of agriculture, students tend to retain at slightly higher rates than the national level (National Student Clearinghouse Research Center, 2019). Specifically for the college of agriculture examined in this study, students retained to their sophomore year at a rate of 77.3%; however, only 62.4% graduated with an agricultural degree within six years (University of Arkansas Office of Institutional Research, 2023). Student attrition in colleges of agriculture has contributed to the shortage of agricultural graduates (Codallo, 2019), which has been detrimental for the agricultural industry. Consequently, determining ways to improve undergraduate student retention in colleges of agriculture is paramount.

Pre-college academic and demographic variables, such as age, gender, race, ethnicity, socioeconomic status, high school GPA, and ACT scores have been proposed as useful predictors of undergraduate student retention (Huang et al., 2017). Inquiries utilizing these variables in colleges of agriculture have revealed their effectiveness in predicting student retention (Estepp et al., 2019; Garton et al., 2000; Garton et al., 2002; Johnson et al., 2018; Koon et al., 2009), with the exception of Dyer et al. (2002), who reported that students' prior experience in agriculture and enrollment in high school agriculture programs were better predictors of retention than conventional pre-college academic and demographic variables. Nonetheless, while academic and demographic variables have shown efficacy in predicting student retention, they are fixed variables that colleges of agriculture cannot influence. Accordingly, Pritchard and Wilson (2003) suggested that in addition to academic and demographic variables, researchers should examine affective variables, as "students who are emotionally and socially healthy have a greater chance to succeed in college" (p. 18). One affective variable that has been strongly connected with undergraduate student retention and success has been students' sense of belonging (Hausmann et al., 2007; Rhee, 2008; Strayhorn, 2018).

Literature Review

Strayhorn (2018) defined sense of belonging as students' "perceived social support on campus, a feeling or sensation of connectedness, the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the group (e.g., campus community) or others on campus (e.g., faculty, peers)" (p. 29). He further postulated that sense of belonging is grounded in seven core elements: (1) belonging is a universal human need; (2) the need for belonging is a strong motive capable of driving behaviors; (3) the importance of belonging is contextual, time-dependent, and can vary among different populations; (4) sense of belonging is associated with and a result of mattering to others; (5) intersectionality of social identities affects college students' sense of belonging; (6) sense of belonging stimulates positive student outcomes; and (7) sense of belonging is temporal and needs to be continually satisfied as a student's circumstances change.

Scholars (Hoffman et al., 2002; Maestas et al., 2007; Strayhorn, 2018; Vaccaro & Newman, 2022) have maintained that student-peer interactions and relationships, empathetic and supportive faculty, opportunities for student involvement, academic success, and campus climate all contribute to strong social support networks, which can increase college students' sense of belonging. Evidence has shown that sense of belonging is positively related to student-peer interaction; students' participation in Greek life, religious clubs, intramural sports, and other student organizations (Hurtado & Carter, 1997); ease of adjustment to campus (Museus & Maramba, 2011); living in residence halls; academic achievement; time spent studying; and, socializing with students from varying racial/ethnic backgrounds (Maestas et al., 2007; Strayhorn, 2008). Additionally, faculty members who possess an interest in student development can help improve students' sense of belonging through positive student/faculty interactions in and out of the classroom (Hurtado & Carter, 1997; Martin et al., 2018; Means et al., 2022). Faculty who utilize teaching and learning strategies such as cooperative learning help bolster peer support and sense of belonging among students (Means et al., 2022), while personal and regular communication from faculty to students shows faculty support and empathy, which can also help increase students' sense of belonging (Martin et al., 2018).

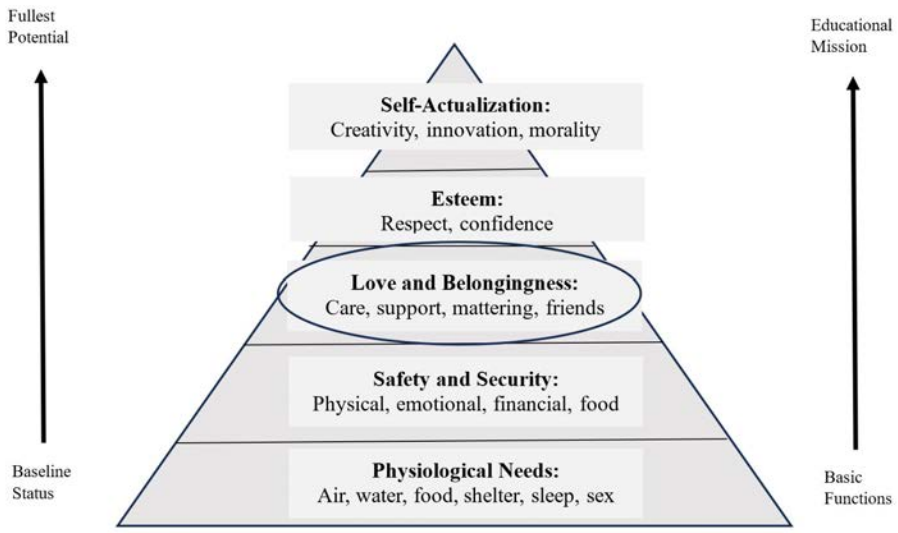
Sense of belonging has been proposed as a powerful influence on undergraduate students' persistence, retention, academic engagement, success, and achievement (Hausmann et al., 2007; Maestas et al., 2007; O'Keeffe, 2013; Pedler et al., 2022; Soria & Stebleton, 2012), particularly among underrepresented groups, such as Black, Indigenous, and People of Color (BIPOC) students, first-generation students, and students from low socioeconomic backgrounds (Strayhorn, 2018). Conversely, in the absence of sense of belonging, students may become disengaged with education-related activities, feel isolated, and be at increased risk of leaving the institution (Strayhorn, 2018). Sense of belonging research among college of agriculture students is limited, however, Giorgi et al. (2022) found that agriculture students possessed a moderate sense of belonging to their college of agriculture with first-generation college students reporting the highest scores. Because sense of belonging has been shown to be an important factor related to student retention and a dearth of literature exists pertaining to students in colleges of agriculture, this study is warranted.

Conceptual Framework

The conceptual framework guiding this study was Strayhorn's (2018) Model of College Students' Sense of Belonging. This model was grounded in Maslow's (1954) needs hierarchy, which hypothesized that human needs vary from basic physiological needs to higher order psychological needs. Maslow (1954, p. 20) stated that, "If both the physiological and safety needs are fairly well gratified, there will emerge the love and affection and belongingness needs..." Strayhorn's (2018) model (Figure 1) situates physiological needs such as air, water, food, shelter, sleep, and sex at

Figure 1.

Model of College Students' Sense of Belonging (Strayhorn, 2018)



the baseline status for an individual, and self-actualization, which consists of creativity, innovation, and morality, as the pinnacle. As lower-level needs are met, the student ascends through the various need layers, and according to the model, moves toward meeting their fullest potential. Additionally, the model illustrates that institutions move toward their educational mission as students move from lower to higher levels within the model (Strayhorn, 2018).

This study focused on examining and predicting college of agriculture students' sense of belonging to the University of Arkansas and Dale Bumpers College of Agricultural, Food, and Life Sciences (AFLS), which aligns with the *Love and Belongingness* layer of Strayhorn's model. According to Hoffman et al. (2002), student sense of belonging is influenced by five constructs: peer support, empathetic faculty, support from faculty, students' comfort within the classroom setting, and isolation, with the latter negatively contributing to sense of belonging. As a result, this study applied these constructs to predicting sense of belonging within Strayhorn's model.

Purpose

College student sense of belonging has been shown to be an important factor related to undergraduate student success and retention. However, little research has been conducted with students in colleges of agriculture. Therefore, the purpose of this study was to examine freshmen students' perceived sense of belonging to the University of Arkansas and the College of Agricultural, Food, and Life Sciences. The objectives guiding this study were:

1. Describe freshmen students' perceptions of peer support, faculty support, classroom comfort, isolation, empathetic/understanding faculty, and their sense of belonging to the University of Arkansas and AFLS.
2. Determine the intercorrelations among the constructs of freshmen students' perceived sense of belonging and demographic variables.
3. Predict freshmen students' perceived sense of belonging to the University of Arkansas and AFLS based on perceived peer support, faculty support, classroom comfort, isolation, and empathetic/understanding faculty.

Methods

The population of interest for this descriptive correlational study was all AFLS freshmen students at the University of Arkansas during the fall 2022 (N = 503) semester. After IRB approval, an invitation email was sent to instructors of all AFLS sections of UNIV 1001, *University Perspectives*, which is a required course for freshmen students. All instructors agreed to allow their classes to participate, and the in-person survey administration occurred in each class during the seventh week of the semester. Students who attended class were provided a QR code and URL to the survey instrument and time was allowed for students to complete the survey during class. Data were collected using Microsoft Forms. A total of 233 students responded to the survey, giving a response rate of 46.3%. Due to the response rate, the results of this study are not generalizable to the entire population, however, as stated by Johnson and Shoulders (2017, p. 310-311), "Studies yielding valid results of interest to the profession from a specific groups [sic] of respondents, regardless of their generalizability, can add to the body of knowledge and assist researchers as they design and conduct research."

Predictors of sense of belonging were measured using a valid and reliable instrument developed by Hoffman et al. (2002) consisting of 26 Likert-type items (1 = *Strongly Disagree* to 5 = *Strongly Agree*) measuring five constructs: (1) peer support, (2) faculty support, (3) classroom comfort, (4) isolation, and (5) empathetic/understanding faculty (sample items are provided in Table 1). Post-hoc reliability coefficients ranged from .85 to .93 for the five constructs. The *peer support* construct measured students' perceived interaction with and support from their peers; similarly, the *faculty support*

construct measured the perceived support received from campus faculty. The *classroom comfort* construct measured students' perceived comfort level for participating in class discussions and activities. The *empathetic/understanding* faculty construct measured students' perceptions of the empathy levels of their professors. Lastly, the *isolation* construct measured students' perceived level of isolation from their peers.

Ten Likert-type items developed by Hurtado and Carter (1997) were utilized to measure students' sense of belonging to the overall University of Arkansas community and the AFLS community. Five items measured sense of belonging to university (α = .90), while the remaining five items measured sense of belonging to AFLS (α = .91). A sample item measuring sense of belonging to campus community was, "I see myself as part of the University of Arkansas (or AFLS) community." Lastly, to adequately describe the sample and determine which demographic variables were related to students' Sense of Belonging, 16 items measured student demographics. Race/ethnicity responses were categorized into BIPOC and non-BIPOC for analysis. Data were analyzed using SAS v.9.4 and analyses included descriptive statistics (summated means and frequencies), bivariate correlations, and ordinary least-squares multiple regression.

Table 1.

Sample Items for the Sense of Belonging Predictor Constructs

Construct	Sample Item
Peer Support	I have developed personal relationships with other students in class
Faculty Support	I feel comfortable seeking help from a teacher before or after class
Class Comfort	I feel comfortable volunteering ideas or opinions in class
Empathetic/ Understanding Faculty	I feel that my teacher would take time to talk to me if I needed help
Isolation	I rarely talk to other students in my classes*

Note. 5-point Likert-Type scale was measured using *1* = *Strongly Disagree* to *5* = *Strongly Agree*; *Items in the isolation construct were negatively worded so higher agreement indicates higher perceived isolation.

Results

Most respondents identified as female (75.5%) and Caucasian (78.9%). Among the students who identified as BIPOC, 5.2% were African American, .9% were Asian, 7.3% were Hispanic/Latino, 4.3% were two or more races, and 3.4% preferred not to disclose their race/ethnicity. Fifty-nine percent of respondents majored in agriculture, while 41.0% majored in human environmental sciences. Over one-third (35.0%) of respondents reported a high school weighted GPA (HSGPA) of 4.0 or higher, 47.6% reported HSGPAs in the 3.50 – 3.99 range, 15.4% in the 3.00 to 3.49 range, and 1.7% reported HSGPAs of less than 3.00. More than three-fourths (76.8%) reported having at least one parent who was a four-year college graduate.

Almost two-thirds of respondents (64.8%) reported either never traveling home (22.3%) or traveling home once per month (42.5%), while the remaining students reported traveling home twice per month (16.7%), once per week (7.3%), or more than once per week (27.9%). Based on home ZIP code data provided by the respondents, the median driving distance from campus to home was 240 miles.

Freshmen reported a range of college and campus involvement. Most students were members of one or more campus organizations (76.4%), had attended at least one student organization meeting (60.9%), and had attended a University of Arkansas sporting event (82.8%). In addition, a majority (76.0%) reported they had attended the AFLS welcome event. Overall, students were committed to majors within AFLS, 65.1% indicated they were very or somewhat unlikely to change to a major outside the college.

Summated means of all sense of belonging and related constructs are reported in Table 2. Based on mean scores, the respondents strongly agreed they felt a sense of belonging to the University of Arkansas and AFLS, with means of 4.45 and 4.30, respectively. They somewhat agreed that faculty were empathetic (M = 4.03) and supportive (M = 3.81), and that peers were supportive (M = 3.58). Freshmen were neutral in their perceptions of classroom comfort (M = 3.34) and isolation (M = 3.04).

A majority of freshmen agreed (combination of strongly agree and somewhat agree) they felt a sense of belonging to the university (91.8%) and AFLS (88.7%). However, sizeable minorities of students disagreed (combination of strongly disagree and somewhat disagree) they were comfortable speaking or asking questions in class (28.8%) and had peer support (18.0%) from students in their classes. Finally, over one-third (37.4%) of freshmen agreed (combination of strongly agree and somewhat agree) they felt a sense of isolation.

Using descriptors recommended by Davis (1971), the correlations between student demographics and perceptions of the sense of belonging and related constructs were negligible to moderate. Being a BIPOC student had low, negative associations with sense of belonging to the university (r = -.14) and peer support (r = -.23), and a low positive association with isolation (r = .11). Being an agriculture student had low, negative associations with sense of belonging to the university (r = -.14) and peer support (r = -.14). Being a member of a campus organization and having attended a student organization meeting both had low, negative correlations with isolation (r = -.13 and r = -.16), respectively. Having attended a university sporting event had a moderate, positive correlation (r = .30) with perceived belonging at the university level, while sense of belonging in AFLS had a low, negative association (r = -.29) with the likelihood of changing to a major outside the college. Additionally, GPA had low, negative correlations with classroom comfort (r = -.12) and isolation (r = -.14).

Among the sense of belonging and related constructs (Table 3), there were low to substantial intercorrelations (Davis, 1971). Each construct had a low to substantial negative correlation with isolation, with peer support having

Table 2.

Freshmen Students' Perceptions of Sense of Belonging and Related Constructs

Construct	*n*	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree	*M*	*SD*
University belonging	233	0.9	0.4	6.9	25.3	66.5	4.45	0.60
AFLS belonging	232	0.4	2.2	8.6	35.3	53.4	4.30	0.68
Faculty support	232	2.6	7.3	19.8	35.4	34.9	3.81	0.89
Empathetic faculty	231	0.9	1.7	15.2	40.3	41.2	4.03	0.72
Class comfort	233	10.3	18.5	19.3	25.3	26.6	3.34	1.15
Peer support	233	9.0	9.0	20.6	28.3	33.0	3.58	1.08
Isolation[a]	233	16.3	21.0	25.3	20.2	17.2	3.04	1.10

Note. The percent columns are based on mean limits of 1.00 – 1.80 = strongly disagree, 1.81 – 2.60 = somewhat disagree, 2.61 – 3.40 = neutral, 3.41 – 4.20 = somewhat agree, and 4.21 – 5.00 = strongly agree (Colwell & Carter, 2012). a Items in the isolation construct were negatively worded so higher agreement indicates higher perceived isolation.

Table 3.

Intercorrelations Among Students' Perceived Sense of Belonging and Related Constructs

Construct	X1	X2	X3	X4	X5	X6	X7
Peer support (X1)	1.0	.38***	.52***	.30***	-.61***	.38***	.36***
Faculty support (X2)		1.0	.61***	.62***	-.22***	.47***	.47***
Class comfort (X3)			1.0	.40***	-.32***	.34***	.39***
Empathetic faculty (X4)				1.0	-.18**	.38***	.40***
Isolation (X5)					1.0	-.29***	-.24***
University belonging (X6)						1.0	.49***
College belonging (X7)							1.0

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

the largest negative correlation (r = -.61). Notably, there were substantial, positive intercorrelations between faculty support, empathetic faculty, and classroom comfort. Peer support, faculty support, classroom comfort, and empathetic faculty all had significant and moderate positive correlations with students' sense of belonging in both the university and college. A substantial positive correlation existed between students' sense of belonging to the university and AFLS. Isolation had a significant and low negative correlation with students' sense of belonging in both the university and college.

Two complete-case regression equations were estimated using peer support, faculty support, classroom comfort, empathetic faculty, and isolation to predict (a) university sense of belonging and (b) AFLS sense of belonging. Prior to each analysis, regression diagnostics were conducted and interpreted using the recommendations by Field and Miles (2012) to identify outliers and to check the assumptions of linearity of predictors and criterion, normality of residuals, homogeneity of variance of the residuals, and absence of excessive multicollinearity. For the regression equation predicting university belonging, five outliers (standardized residuals > |3| for one or more predictors) were identified and removed leaving 225 complete cases for analysis. Using the same criteria, three outliers were identified and removed for regression predicting AFLS belonging, leaving 226 complete cases for analysis. Linearity of the predictors and each criterion were verified by significant ($p < .05$) correlations and examination of bivariate scatterplots. Normality of residuals was confirmed by examining the residual plots. Homogeneity of variance for each predictor and its respective criterion were assessed using LM tests with all obtained probabilities > .05 indicating the assumption of homoscedasticity was met. Finally, for both analyses, all variance inflation factors were < 5, indicating excessive multicollinearity of predictors was not a problem.

For the first regression model estimating sense of belonging at the university, the equation containing the five

potential predictor variables was significant, $F(5, 219) = 16.96$, $p < .001$, adjusted $R^2 = .26$. Peer support, faculty support, and isolation were statistically significant predictors of students' sense of belonging to the University of Arkansas (Table 4). Students' sense of belonging increased with increases in perceptions of peer and faculty support and decreased with increases in perceptions of isolation. Student perceptions of empathetic faculty and classroom comfort were not significant predictors of students' sense of belonging. Squared semi-partial correlations (ΔR^2) indicated faculty support was the most robust predictor of student belonging, explaining 4.2% of the unique variance, while peer support and isolation each explained 1.4% of the unique variance.

Table 4.

Regression Model Predicting Students' Sense of Belonging to the University of Arkansas

Predictor	*β*	SE *β*	*t*	ΔR^2
Intercept	3.46	0.24	14.14***	
Peer support	0.08	0.04	2.04*	.014*
Faculty support	0.17	0.05	3.55***	.042***
Isolation	-0.07	0.03	-2.07*	.014*
Empathetic faculty	0.07	0.05	1.51	.008
Class comfort	0.00	0.03	0.10	.000

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

A second regression model used the five potential predictor variables to predict students' sense of belonging in AFLS. The model was statistically significant, $F(5, 220) = 18.22$, $p < .001$, adjusted $R^2 = .28$, with peer support, faculty support, and empathetic faculty entering as significant predictors (Table 5). Students' sense of belonging in AFLS increased with increases in each significant predictor. Student perceptions of class comfort, and isolation were not significant predictors of sense of belonging in the college. Squared semi-partial correlations (ΔR^2) indicated faculty support was the most robust predictor of student belonging, explaining 2.6% of the unique variance, while empathetic faculty and peer support explained 1.5% and 1.4% of the unique variance, respectively.

Conclusions/Discussion/Implications/ Recommendations

When examining the findings from this study, several conclusions can be drawn. First, respondents generally perceived they had a strong sense of belonging to both AFLS and the University of Arkansas. Furthermore, the students in this study had a higher perceived sense of belonging than the participants in Giorgi et al.'s (2022) study. Students' perceptions of peer support, faculty support, classroom comfort, and empathetic/understanding faculty were lower than their perceived sense of belonging. While most students perceived faculty to be empathic and understanding, they also

Table 5.

Regression Model Predicting Students' Sense of Belonging in the College of Agricultural, Food, and Life Sciences

Predictor	*β*	SE *β*	*t*	ΔR^2
Intercept	2.73	.30	9.15***	
Peer support	0.10	0.05	2.08*	.014*
Faculty support	0.17	0.06	2.86**	.026**
Isolation	-0.03	0.04	-0.82	.002
Empathetic faculty	0.14	0.06	2.18*	.015*
Class comfort	0.05	0.04	1.12	.004

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

reported slightly lower levels of comfort when seeking help from faculty. Most students were neutral in their perceptions of classroom comfort, meaning they are ambivalent toward speaking in class, volunteering ideas, asking questions, and contributing to classroom discussions. Just over half of respondents agreed they had peer support, however, one concerning finding was that over a third of students reported feeling isolated. Students' feelings of isolation suggest that some students are not fully situated within Strayhorn's (2018) level of Love and Belongingness, which could imply unmet lower level needs. Respondents' perceptions of their sense of belonging and related constructs indicated that while some students were on a trajectory for success as described by Strayhorn (2018), others who felt isolated and uncomfortable in the classroom may be at risk of leaving. This should encourage AFLS to further examine students' sense of belonging and provide opportunities to help impact sense of belonging, combat isolation, and ensure subsequent undergraduate success (Hoffman et al., 2002; Strayhorn, 2018).

Demographic correlations with belonging, comfort, support, and isolation yielded a few notable relationships worthy of further examination. BIPOC students reported lower perceived peer support and sense of belonging with the university, along with higher levels of isolation, which was congruent with Strayhorn (2008) and Maestas et al. (2007). These findings suggest that underrepresented students could benefit from additional support in acclimating to campus. Respondents who were involved in campus organizations reported lower levels of isolation (Hurtado & Carter, 1997), and students who had attended a university sporting event had a greater sense of university belonging. At the college level, a positive sense of belonging was associated with a lower reported likelihood of changing to a major outside of the college. These descriptive findings align with conclusions of previous studies indicating participation in campus organizations and activities is related to higher sense of belonging (Hoffman et al., 2002; Hurtado & Carter, 1997; Maestas et al., 2007; Strayhorn, 2018). AFLS should seek ways to encourage peer interaction and student involvement early in the semester, particularly for BIPOC students.

Intercorrelations between sense of belonging constructs revealed several interesting associations. Fewer students possessed as strong of a sense of belonging to AFLS as they did the university. While the reason for this is unknown, this supports Strayhorn's (2018) core element that sense of belonging is temporal, contextual, and must be continually satisfied as students' circumstances change. Students who felt supported by faculty also reported a greater sense of belonging with the university and AFLS, which is congruent with prior research (Maestas et al., 2007; Strayhorn, 2018). Correlations revealed that faculty members who exhibit empathy are perceived as providing more support, which can help bolster students' sense of belonging (Hurtado & Carter, 1997). Students who perceived faculty and peers as supportive reported being more comfortable and confident interacting in the classroom. This finding aligns with Strayhorn's (2018) core element number four, which posited that support and mattering positively affect sense of belonging. As expected, students who experienced isolation reported lower perceptions among all constructs, however, one noteworthy finding was the highest levels of isolation were among those who perceived less peer support. Strayhorn (2008) posited that students' social engagement among peers influences their sense of belonging, thus those students in this study who failed to connect with their peers could become more disengaged socially and academically and potentially leave the university (Maestas et al., 2007).

When predicting students' sense of belonging at the university level, peer support, faculty support, and isolation were significant predictors. These constructs have previously been reported as contributing to strong social networks, and thus, sense of belonging (Hoffman et al., 2002; Maestas et al., 2007; Strayhorn, 2018; Vaccaro & Newman, 2022). This finding highlights the importance of helping freshman students establish strong social networks among peers and faculty as they enter the university setting; these social networks can counteract the negative effects of isolation (Strayhorn, 2018). However, it should be noted that for the model predicting students' sense of belonging at the university, only a small portion of the variance was explained by faculty support, peer support, and isolation. This indicates there are other factors contributing to students' sense of belonging to the University of Arkansas, and these other factors should be explored. Empathetic faculty and classroom comfort were not significant predictors of sense of belonging as expected from the literature (Hoffman et al., 2002; Maestas et al., 2007; Strayhorn, 2018; Vaccaro & Newman, 2022).

Predicting students' sense of belonging in AFLS revealed that peer support and faculty support were significant predictors; however, different from the first model, empathetic faculty predicted students' sense of belonging in the college while isolation did not. These findings are encouraging, as AFLS prides itself on having student-centered faculty members and a close-knit environment. Similar to the first regression model, only a small portion of the variance in AFLS sense of belonging was explained by faculty support, empathetic faculty, and peer support signifying there are more factors involved. Nevertheless, these three factors warrant our attention. Our findings support previous research highlighting the importance of these factors in contributing to establishing a strong social network among college students and fostering a positive sense of belonging (Hoffman et al., 2002; Hurtado & Carter, 1997; Maestas et al., 2007; Strayhorn, 2018; Vaccaro & Newman, 2022).

Based on students' reported sense of belonging and Strayhorn's (2018) model, the conclusion can be made that many students had their physiological and safety needs met. However, not all students indicated a strong sense of belonging, and while this study did not assess physiological and safety needs, it is plausible those who reported lower sense of belonging may possess unmet physiological and safety needs. When lower-level needs are unmet, students can be prevented from reaching their fullest potential and the educational mission of the institution cannot be met (Strayhorn, 2018). Therefore, we recommend that future sense of belonging studies examine students' physiological and safety needs. Failure to reach the pinnacle of Strayhorn's model may continue to contribute to the retention issues previously reported (Reason, 2009) resulting in a continued shortage of qualified agricultural graduates to fill industry needs (Fernandez et al., 2020).

One practical recommendation emerging from this study was faculty members in AFLS should provide more opportunities for positive in-class peer interaction and create a classroom environment conducive to peer collaboration. Faculty could utilize cooperative learning activities in the classroom as a strategy to help students build social networks and foster a sense of belonging (Means et al., 2022). This would provide an opportunity for freshmen to construct new peer relationships (Pritchard & Wilson, 2003), which could decrease their sense of isolation as they enter the unfamiliar social environment of college. Furthermore, AFLS should also continue to provide and expand opportunities for greater student and faculty interaction outside of the classroom (Hurtado & Carter, 1997). Such opportunities might include increasing the number of student organizations, undergraduate research, study abroad opportunities, living learning communities, and social gatherings. Due to their lower sense of belonging, additional support for BIPOC students by AFLS is warranted. The use of peer mentors and secondary academic advisors for BIPOC students, similar to how college athletes have a secondary advisor, has been shown to improve student sense of belonging at other institutions (Bayless & Parkinson, 2022) and could be considered for AFLS.

Further research should be conducted to study the relationships between belonging, support, comfort, and isolation. Also, because these variables only contributed to a small amount of the variance in sense of belonging, researchers should parse out other affective and institutional variables that can help predict sense of belonging. These variables are worthy of evaluation in a larger sample and across a wider variety of college locations. Data should also be collected over time to yield longitudinal results related to predicting academic performance and retention among students in colleges of agriculture. Additional research should examine effective strategies to prevent isolation and increase BIPOC students' sense of belonging in colleges of agriculture, particularly as it pertains to intersectionality of identities (Strayhorn, 2018). Sense of belonging's ability

to predict retention should be measured in conjunction with other factors, such as pre-college academic and demographic variables (Huang et al., 2017), as well as other affective variables (Pritchard & Wilson, 2003) to gain a clearer picture of student retention. Finally, additional data collection at all levels of Strayhorn's (2018) hierarchy could provide colleges of agriculture important information about whether students have unmet physiological and safety needs.

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