Achievement Goal Orientation as a Predictor of High-Impact Practice Participation for Postsecondary Students

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Achievement goal orientation has been studied within education for decades, and previous research has linked the construct to student achievement and engagement. This study uses the 2x2 achievement goal orientation as a framework for exploring high-impact practice (HIP) participation for approximately 8,000 college students across 15 different institutions participating in the National Survey of Student Engagement (NSSE). Through a series of binary logistic regression analyses, results suggest students who employ a mastery-approach orientation are more likely to partake in a variety of beneficial HIPs, such as learning communities, research with faculty, service learning, study abroad, culminating experience, and formal leadership roles. Results for the remaining achievement goal orientations were more mixed, with some positively predicting HIP participation and others emerging as negative predictors.

Introduction

Achievement goal orientation, generally described as the reason or motivation students have to carry out a specific task or tasks (Hsieh et al., 2007), is a concept that has been examined within education for decades. Various studies have linked achievement goal orientation to numerous outcomes, some considered more positive and others considered more negative (Hulleman et al., 2010). Additionally, researchers and educators have developed practical recommendations for either encouraging or suppressing certain orientations, based on this large corpus of work (Elliot & Hulleman, 2017). However, these suggestions are frequently given in the context of K-12 classrooms, even though many of the initial studies of achievement goal orientation used convenience samples of college students in subject pools (Elliot, 2006). Achievement goal orientation is less often utilized to explore established elements within higher education, such as participation in the high-impact practices (HIPs) of learning communities, research with faculty, service learning, internships, study abroad, senior capstone experiences, and formal leadership (Kuh, 2008). A major goal of this study was to bridge this gap between educational psychology and higher education by exploring the relationships between achievement goal orientation and HIP participation with a large multi-institution data set.

Definitions and Connections

Achievement goal orientation is often defined using two dimensions of competence in various combinations with one another: definition (absolute/normative) and valence (positive/negative) (Elliot, 2006). These two dimensions of competence yield four distinct orientations: mastery-approach (goal of attaining task-based or intrapersonal competence); performance-approach (goal of attaining normative competence); mastery-avoidance (goal of avoiding task-based or intrapersonal incompetence); and performance-avoidance (goal of avoiding normative

incompetence) (Bruning et al., 2011; Elliot & Murayama, 2008). A mastery (also called "learning") orientation is related to a person's inclination to acquire and improve skills necessary to complete a task, while performance orientation is rooted in a need to be perceived positively by peers, within the context of task completion (Phillips & Gully, 1997; VandeWalle et al., 2001). An extensive amount of prior research is aligned with this 2x2 model, although it is worth noting that newer frameworks, such as a 3x2 model that includes a task-specific element, have been proposed as well (see Elliot et al., 2011 for details).

Performance-avoidance goal orientation occurs when learners will avoid certain tasks to prevent a feeling of incompetence; this often does not facilitate a sense of learning or achievement (Bruning et al., 2011). Hsieh and colleagues (2007) found students with lower GPAs are more likely to exhibit performance-avoiding behaviors while students with higher GPAs are more prone to mastery goal orientation. Performance goal-orientation is marked by attempts to avoid difficult tasks so as not to appear incompetent (Locke & Latham, 2006), and related to shallow processing (Greene & Miller, 1996) and unwillingness to work with others (Midgley et al., 2001). However, performance-approach goal orientation can sometimes facilitate high achievement under extremely challenging conditions (Senko et al., 2013) and positively predict well-being (Gillet et al. 2014). In comparison, mastery goals are generally perceived as the most advantageous within educational contexts, and are connected to positive outcomes such as efficacy, interest, effort, persistence, and positive affect (Pintrich, 2000; Senko & Miles, 2008; Wolters, 2004). Holding mastery goals can also safeguard against negative behaviors and emotions after experiencing failure (Smiley et al., 2016).

Achievement goal orientation can be a predictor of academic achievement, with support for a direct connection between mastery goals and academic achievement (Linnenbrink-Garcia et al., 2008). However, this link can also be complicated by mediating or moderating relationships with other student behaviors (Lee & Anderman, 2020; Karlen et al., 2019; Putwain et al., 2018). For instance, Putwain and colleagues (2018) discovered that mastery-approach, when mediated by behavioral engagement, was a predictor of mathematics achievement (although performance-approach was not significant in their elementary school-aged sample). Research also demonstrated a positive correlation between mastery goal orientation and intrinsic motivation in high school students; correspondingly, the higher the intrinsic motivation of the students, the greater their academic achievement (Karlen et al., 2019). Furthermore, Diseth and Kobbeltvedt (2010) found that the relationship between goal orientation and achievement can be mediated by the through the use of learning strategies. Huang's meta-analysis (2012) found that approach motivations were associated with higher academic achievement, and avoidance motivations were associated with lower academic achievement, albeit with small effect sizes and few significant moderators overall.

It is worthy of mention that achievement goal orientation is subject to change over time within an individual (Shim et al., 2008; Tuominen-Soini et al., 2011). Moreover, there is also some evidence for changes in achievement goal orientations through intervention, indicating that in certain situations, teachers or other authority figures can encourage mastery goals rather than performance goals (see Elliot & Hulleman, 2017 for a review). In particular, research suggests that providing moderately challenging tasks that are inquiry-based, intrinsically interesting to students, focusing on improvement, and promoting positive self-talk can support the

development of mastery goals within educational contexts (Linnenbrink, 2005; Marjanović et al., 2019; Post & van der Molen, 2021). Additionally, some studies in sports and business settings have also demonstrated changes to goal orientations through targeted interventions (Schmidt & Ford, 2003; Smith et al., 2007; Stevens & Gist, 1997).

Achievement Goal Orientation in Higher Education

Implications of achievement goal orientation studies are frequently situated from a K-12 classroom perspective (Bruning et al., 2011; Sideridis, 2005) or fields outside of education, such as sport or organizational psychology (Locke & Latham, 2006; Van Yperen et al., 2014). Most self-report measures of the construct are validated with samples of college students (Elliot & Murayama, 2008; Elliot et al., 2011), but there are fewer applications of the theory within this population that extend beyond their use as a convenience sample. There have been scarce efforts to incorporate achievement goal orientation within well-known higher education theoretical frameworks (such as Astin, 1993 or Kuh, 2003), although recent research suggests that there is a strong relationship between mastery-approach goal orientation and several aspects of undergraduate student engagement, including reflective and integrative learning, higher-order learning, and student-faculty interaction (Miller et al., 2021). Additionally, earlier research from Harackiewicz and colleagues (2002) found that mastery goals predicted a continued interest in major over time in longitudinal study of undergraduates, and performance-approach goals predicted higher grades and GPA. Likewise, Durik and colleagues (2009) demonstrated that performance-approach goals positively predicted cumulative college GPA, while performance-avoidance goals negatively predicted GPA. Barron and Harackiewicz (2003) also found that a match between students' perceived classroom climate and their achievement goals can influence the relationship between goals and outcomes.

High-Impact Practices

Student engagement, defined as student involvement in educationally purposeful activities (Kuh, 2001), is generally found to influence many important outcomes in higher education, including learning, satisfaction, persistence, and graduation (Astin, 1993; Chickering & Gamson, 1987; Kuh, 2003; McCormick et al., 2013; Pascarella & Terenzini, 2005). Engagement is comprised of a broad range of experiences, attitudes, and perceptions (Kuh, 2001; McCormick et al., 2013) and can be both directly and indirectly connected to courses and academic behaviors. Student engagement has several interconnected elements, situated both inside and outside of the classroom (Kuh, 2001). Some of these elements are more conventionally based on classroom experiences, with many behaviors contributing to the development of both content knowledge and general cognitive processing skills, and all are related to numerous aspects of achievement and success (Ormrod, 2011; Pascarella & Terenzini, 2005).

One important aspect of engagement is participation in high-impact practices (HIPs). Kuh (2008) recognized several specific engagement practices as being remarkably effective in promoting learning, development, and persistence among students. Programs such as learning communities, service learning, undergraduate research with faculty, internships, capstone projects, and study abroad were recognized as "high-impact" due to their positive connection with key educational outcomes as well as the mutual qualities that influence their effectiveness. Although they may

vary in their precise operations from one institution to the another, generally HIPs require a considerable amount of students' time and effort, structured opportunities for reflection and integrative thinking, substantive feedback from faculty, meaningful contacts with faculty and peers, and interactions with diverse others (Kuh & O'Donnell, 2013). Participation in HIPs is related to gains in student learning, psychosocial development, academic performance, future career plans, early job attainment, and early career outcomes (Mayhew et al., 2016; Miller at al., 2018; Wolniak & Engberg, 2019). However, it is essential to point out that many other demographic and institutional factors can also influence HIP access and experience (Mitchell et al., 2012; Pascarella & Terenzini, 2005).

Generally, there is a great deal of interest within higher education concerning HIPs because of their positive association with student learning and development in college. For example, participating in a learning community, where students take two or more courses as a group and work closely with one another and their professors on a common topic, has been connected to higher GPAs, increases in collaborative learning and interactions with faculty, and self-reported learning gains (Rocconi, 2011; Zhao & Kuh, 2004). In particular, living-learning programs, where students in learning communities also live in the same residence hall, are positively associated with studying and holding academic discussions with peers, interacting with faculty members, and feelings of social support regarding residence hall climate (Brower & Inkelas, 2010). Service learning activities, where students participate in a project or organization that serves the community, offer students the opportunity to solve problems and have also been shown to increase intrapersonal development and multicultural communication skills (Chesbrough, 2011; Keen & Hall, 2009). Research suggests that students involved in community service earn higher grades, gain interpersonal skills, compassion, social awareness, and empathy; while post-graduation they are more likely to donate to charitable causes and hold civic leadership positions (Astin et al., 2000; Mayhew et al., 2016; Rockenbach et al., 2014). At the undergraduate level, research with faculty allows students to explore a substantive area of research, gain technical skills, and improve critical thinking; it also provides students with a better understanding of the potential graduate school experience and increases their likelihood of attending graduate school (Craney et al., 2011; Lopatto, 2007; Miller et al., 2018).

Some important HIPs, such as internships, study abroad, and capstone experiences are more likely to occur later on during a student's undergraduate path, during the third or fourth years. Completing an internship or other direct experience in a work setting not only offers students practical applications and real-world experiences but has further been shown to increase gains in academic performance, students' leadership skills, professional development, and intercultural effectiveness (Coco, 2000; Kilgo et al., 2015; Trede & McEwen, 2015). Recent studies suggest that internships are also linked to greater likelihood of early job attainment (Miller et al., 2018) and more successful employment outcomes after graduation (Nunley et al., 2016). Completing a senior capstone course or project, where students integrate and apply what they have learned over their time at their institutions, has been associated with students' ability to think imaginatively and integrate, synthesize, and apply course concepts to practice (Kinzie, 2013). Furthermore, participation in a study abroad program allows students to explore cultures, life experiences, and worldviews different from their own; this kind of experience has been shown to heighten students' linguistic competency, intercultural competencies, and interpersonal accommodation (i.e., patience/flexibility) (Cisneros-Donahue et al., 2012; Stebleton et al., 2013).

The Current Study

Given the vast research on the importance of both achievement goal orientation and participation in high-impact practices, but also considering the mixed results concerning positive and negative outcomes of the different orientations, the goal of the current study was to explore constructs as means of bridging existing research across educational psychology and higher education. This study addressed this goal using a multi-institution sample of first-year and senior students at colleges and universities across the United States. Specifically, the current study addressed the following research question: *Are the four types of achievement goal orientation able to predict undergraduate participation in learning communities, service learning, undergraduate research with faculty, internships, capstone projects, study abroad, and formal leadership experiences, even after controlling for other student and institutional characteristics?*

Method

Data and Sample

This study utilizes data from the 2015 administration of the National Survey of Student Engagement (NSSE). NSSE annually collects information from first-year and senior college students about the nature and quality of the programs and activities in which they are engaged while at their higher education institutions. NSSE items cover a broad array of topics related to student experiences, time spent on various activities, and perceptions of institutional climate and support. NSSE has always focused on first-year and senior students for data collection, as they are at two key points in their undergraduate educational journeys, with first-year students establishing a foundation and seniors having acquired the most college experience (NSSE, 2018). Data indicate that since the experiences of these groups are so different, it is best to keep them separate for analytic purposes in order to accommodate varied patterns of retention, transfer, persistence, and enrollment (NSSE, 2011). Thus, NSSE has a rigorous requirement to keep these groups of students separate in reporting and analysis, and this was subsequently applied to the grouping choices for the current study.

In the overall 2015 administration, data were collected from over 300,000 first-year and senior respondents from 541 four-year degree-granting colleges and universities. Student respondents and participating institutions are largely representative of all United States undergraduate students at 4-year institutions, with a few exceptions (female, White, and full-time students are slightly overrepresented) (NSSE, 2015). Institutions choose to administer NSSE to their students for a range of reasons, including national and regional accreditation, departmental or program assessment, curricular improvement for general education courses, and institutional advancement efforts (e.g., retention rates, FYE programming, high-impact practices).

In addition to the main survey instrument, NSSE adds experimental questions for research and development purposes, and this study incorporates responses from one of these sets. There was available data from 8,530 students across 15 different universities. There were seven public and eight private institutions. For enrollment size, there were four schools with under 2,500 students, two schools in the 2,500 – 4,999 range, three in the 5,000 – 9,999 range, and five with over

10,000 students. For Carnegie classification, seven were Doctoral universities, five were Master's colleges and universities, and three were Baccalaureate colleges.

First-year students made up 46% of the respondents, while the remaining 54% were seniors. The sample was 40% males and 60% females, with 88% reporting full-time enrollment status. There were 47% of respondents reporting first-generation status and 80% were under 25 years old. In terms of racial/ethnic diversity, the sample was 55% White, 12% Black/African American, 13% Hispanic or Latino, 7% Asian/Asian American, with the remaining respondents falling into other or multiple racial categories.

Data Collection Procedures

Potential respondents were recruited through an email requesting their participation in the survey. All first-year and senior students at the institutions are sent the email, which included a link to the online survey. The instrument was completed online during untimed sessions. NSSE is administered every year during the spring semester, which depends on the various institutional calendars and can range from February to May. Students are sent a maximum of five contact emails. In 2015, the average response rate across all participating institutions was 29%.

Measures

The Achievement Goal Questionnaire-Revised (AGQ-R; Elliot & Murayama, 2008) was part of the experimental set. The AGQ-R measured achievement goal orientation with a 12-item scale for performance-approach, performance-avoidance, mastery-approach, and mastery-avoidance goal orientations. Respondents reported level of agreement with statements about their academic motivations and behaviors on a 5-point Likert-type scale (i.e. "My goal is to learn as much as possible" and "I am striving to do better compared to other students"). Four subscale scores, one for each of the goal orientations, were calculated by summing the items, and higher scores signify higher levels of the particular goal orientation. Scores can range from 3 to 15 for each subscale (see Table 1 for alphas and descriptive statistics). Initial development and subsequent revisions for this instrument found that both exploratory and confirmatory factor analysis supported the 2x2 structure predicted by achievement goal theory and offered evidence for concurrent and predictive validity (Elliot & McGregor, 2001; Elliot & Murayama, 2008).

The seven different outcomes used in this study were obtained from items on the core survey that ask students about their participation in various HIPs. Specifically, items asked students if they have done or are in the progress of doing a learning community, study abroad, a research project with a faculty member, an internship, a culminating senior experience, a community-based project or service-learning project, and a formal leadership role on campus. Because there are differences in participation opportunities depending on student class level, for first-year students, only learning community, research with faculty, and service learning were examined as HIPs, while for seniors all seven HIP items were included (see https://nsse.indiana.edu/nsse/survey-instruments/high-impact-practices.html for more details).

Table 1
Achievement Goal Questionnaire-Revised Alpha Coefficients and Descriptive Statistics

	# of Items	FY: Cronbach's α	FY: Mean	FY: SD	SR: Cronbach's α	SR: Mean	SR: SD
Performance-Approach	3	.87	11.47	2.92	.88	11.21	3.16
Performance-Avoidance	3	.88	11.20	3.26	.91	10.62	3.65
Mastery-Approach	3	.87	11.91	2.55	.86	12.00	2.57
Mastery-Avoidance	3	.83	10.45	3.34	.83	10.21	3.47

The main survey instrument also collects demographic information from respondents, which is then combined with institution-provided or publicly available data. This information served as control variables for the analyses. As a wide variety of higher education research notes important differences in the educational experiences of students based on these characteristics (see Mayhew et al., 2016 and Pascarella & Terenzini, 2005 for a review), it is critical to include them in the analyses. Existing research also recognizes the potential influence of sociodemographic characteristics for achievement goal orientation (Hulleman et al., 2010; Lochbaum et al., 2020; Miller, 2022; Witkow & Fuligni, 2007), offering further rationale for the inclusion of control variables in statistical models.

Analyses

A series of 10 binary logistic regression analyses were used to explore the relationship between certain student and institutional characteristics, the types of achievement goal orientation, and HIP participation. The demographic variables were first introduced as independent variables in the model (sex, transfer status, enrollment status, first-generation status, age, SAT/ACT, institutional control, enrollment size, race/ethnicity, major field, grades, percentage of online courses, and Honors College status). In the second step of the modelling process, achievement goal orientation scores were added to estimate the unique effect of mastery-avoidance, mastery-approach, performance-avoidance, and performance-approach orientation. Separate models were conducted for first-year students and seniors, with each of the class-appropriate HIPs as dependent variables. See Appendix A for details on the independent variables.

Results

Each of the models can be interpreted in terms of overall explained variance, relative unique contributions of variance for the achievement goal orientations, the individual odds ratios for each achievement goal subscale, and the significance of these odds ratios. Considering the explained variance across the ten models, the results show that relative to the control variables, the four types of achievement goal orientation have fairly weak explanatory power in the models.

Although the overall explained variance ranged from 6.6% to 19.7%, with statistical significance ($p<.001$) for each of the full models, the inclusion of the achievement goal orientation only explained between .4% and 1.2% of the variance (Table 2).

Table 2

Model summary statistics for logistic regressions

	Total R^2 (Nagelkirke)	Total % Correctly Classified	ΔR^2 Block 1: Student Demographics	ΔR^2 Block 2: Goal Orientations
FY: Learning Community	.136	78.6%	.131	.005
FY: Research w/ Faculty	.078	94.6%	.067	.011
FY: Service Learning	.066	59.9%	.062	.004
SR: Learning Community	.139	67.9%	.127	.012
SR: Research w/ Faculty	.170	73.9%	.158	.012
SR: Service Learning	.186	70.0%	.177	.009
SR: Internship	.197	69.0%	.193	.004
SR: Study Abroad	.164	84.2%	.159	.005
SR: Capstone	.126	66.9%	.117	.009
SR: Formal Leadership	.176	65.2%	.163	.013

Notes: All total Nagelkirke R^2 values are significant at $p<.001$. FY = first-year. SR = senior.
Block 1 includes: sex, transfer status, enrollment status, first-generation status, age, SAT/ACT, institutional control, enrollment size, race/ethnicity, major field, grades, percentage of online courses, and Honors College status
Block 2 includes: mastery-avoidance, mastery-approach, performance-avoidance, performance-approach goal orientations

Despite the relatively low unique explained variance, many of the achievement goal orientation subscales had statistically significant odds ratios. Therefore, more specific and potentially useful information can be gleaned from further examination of the odds ratios in terms of patterns of prediction for the four types of achievement goal orientation and HIP participation. The results for first-year students indicate that for learning communities, none of the achievement goal orientations are significant predictors of participation (Table 3). For service learning, performance-avoidance is a negative predictor (OR = .945). For research with faculty, mastery-avoidance is a positive predictor (OR = 1.127), while mastery-approach (OR = .905) and performance-avoidance (OR = .889) are negative predictors.

Table 3

Achievement goal orientation as predictors of HIP participation for first-year students

First-year	Learning Community	Research w/ Faculty	Service Learning
Block 2	*Odds Ratios (Block 2)*		
Mastery-Avoidance	1.027	1.127**	1.032
Mastery-Approach	1.049	0.905*	0.995
Performance-Avoidance	0.971	0.889***	0.945**
Performance-Approach	1.017	1.092	1.034

**p<.05; **p<.01; ***p<.001*
Models controlling for: sex, transfer status, enrollment status, first-generation status, age, SAT/ACT, institutional control, enrollment size, race/ethnicity, major field, grades, percentage of online courses, and Honors College status. See Appendix B for full list of odds ratios.

For the models predicting senior participation in HIPs, there were also some expected findings, as well as some that were more surprising (Tables 4 and 5). Mastery-approach orientation (OR ranging from 1.059 to 1.108) was a positive predictor of participation for every HIP except internships. Conversely, performance-avoidance orientation was a negative predictor of formal leadership only (OR=.950). In terms of surprising results for seniors, while performance-approach was a positive predictor for learning communities and formal leadership (OR=1.054 and 1.049, respectively), it was a negative predictor for service learning (OR=.938).

Table 4

Achievement goal orientation as predictors of HIP participation for seniors (Part 1)

Seniors	Learning Community	Research w/ Faculty	Service Learning
Block 2	*Odds Ratios (Block 2)*		
Mastery-Avoidance	0.967	1.012	0.993
Mastery-Approach	1.059*	1.108***	1.096***
Performance-Avoidance	0.996	0.980	1.016
Performance-Approach	1.054*	0.974	0.938*

*p<.05; **p<.01; ***p<.001

Models controlling for: sex, transfer status, enrollment status, first-generation status, age, SAT/ACT, institutional control, enrollment size, race/ethnicity, major field, grades, percentage of online courses, and Honors College status. See Appendix C for full list of odds ratios.

Table 5

Achievement goal orientation as predictors of HIP participation for seniors (Part 2)

Seniors	Internship	Study Abroad	Capstone	Formal Leadership
Block 2	*Odds Ratios (Block 2)*			
Mastery-Avoidance	0.974	0.960	0.989	0.998
Mastery-Approach	1.047	1.064*	1.069**	1.079**
Performance-Avoidance	0.976	0.997	1.005	0.950*
Performance-Approach	1.022	0.981	1.017	1.049*

*p<.05; **p<.01; ***p<.001

Models controlling for: sex, transfer status, enrollment status, first-generation status, age, SAT/ACT, institutional control, enrollment size, race/ethnicity, major field, grades, percentage of online courses, and Honors College status. See Appendix D for full list of odds ratios.

Discussion

In general, the models for the seniors had greater explained variance than those for first-year students. However, even for those senior models with higher explained variance, the unique contributions of the achievement goal orientations were rather low. This suggests that many other factors, some of which were included as control variables in the models and some of which were not available and/or measurable, are playing a role in students' HIP participation. Although it is beyond the scope of this particular study to interpret all of the odds ratios from each of the logistic regression models, it is worth pointing out that many other predictor variables had statistically significant odd ratios, of varying direction and magnitude. Full details are available

in Appendices B, C, and D, and future research concerning HIP participation should delve deeper into the patterns for the demographic and institutional control variables.

For the odds ratios that were significant, some of these patterns were expected, while others were somewhat more surprising. For first-year students, in the model looking at service learning, performance avoidance is a negative predictor. Conversely, for research with faculty, mastery-avoidance is a positive predictor, and both mastery-approach and performance-avoidance are negative predictors. While it is not surprising that performance-avoidance would be a negative predictor, it is more notable that mastery-approach was a negative predictor of research with faculty. Generally, a mastery-approach orientation is associated with more positive academic achievement and educational outcomes (Locke & Latham, 2006; Pintrich, 2000), yet in this instance seems to be a deterrent for participation in research with faculty. Perhaps as first-year students, those high in mastery-approach orientation do not yet feel qualified or fully invested enough in a subject area to consider the option of research with faculty. Also noteworthy is that those students higher in mastery-avoidance were *more* likely to do research with faculty, suggesting that those students might be experiencing some kind of "academic FOMO" (fear of missing out, to borrow a term from popular culture) and seek out research with faculty as a means of prevention. Additional research is needed to further explore these patterns.

For the models predicting senior HIP participation, mastery-approach was a positive predictor of all HIPs but internships. This pattern is consistent with previous research demonstrating the educational benefits of this goal orientation (Miller et al., 2021; Pintrich, 2000). On the other hand, performance-avoidance orientation was only a negative predictor of formal leadership. This finding suggests that this orientation may not be as disadvantageous as previously thought (Bruning et al., 2011), but also that students who want to avoid appearing unintelligent in their courses do not want to appear incompetent in front of their peers during extracurricular activities either. Prior mixed findings for mastery-avoidance were also consistent with a lack of significant odds ratios in any of the senior models here (Hulleman et al., 2010; Sideridis, 2008). Finally, the somewhat surprising finding that performance-approach was a *negative* predictor of service learning for seniors needs further exploration to better explain this predictive direction. Although speculative, perhaps one rationale is that service learning may not be considered as high-value of an activity to have on a transcript or résumé.

Limitations

Although there are many strengths of this study, some limitations should be noted. Given the data collection procedures and response rates, the sample may not be representative of all students at four-year universities and caution should be made when making generalizations. Furthermore, this study relied on self-reported data, which may not always be completely objective. However, most studies looking at self-reports in higher education suggest that self-reports and actual measures of things like abilities are positively related (Anaya, 1999; Pike, 1995) and social desirability bias does not have a substantial influence on student responses for surveys of basic cognitive and academic behaviors (Miller, 2012). The lower response rate could potentially be another source of bias in the available data; however, previous research suggests that studies with lower response rates can still demonstrate acceptable response representativeness (Fosnacht et al., 2017; Lambert & Miller, 2014). Additionally, there were

relatively low odds ratios and percentages of explained variance for many of the models, which suggest that there are many other influential factors not included in the analyses (Courville & Thompson, 2001). Moreover, given the research design, this study was unable to test for causal relationships between achievement goal orientation and HIP participation, but instead can only confirm whether or not they are associated. Although the terminology of logistic regression includes words such as "predictor" and "outcome" variables, given the parameters of the data collection the results are still considered correlational findings.

Conclusions

Overall, this study provides evidence to support the relationship between achievement goal orientation and participation in certain HIPs, with patterns suggesting that mastery-approach orientation is generally a positive predictor, while the other orientations had more mixed results. Future research should further explore motivation for HIP participation, perhaps at a more granular level that involves qualitative research such as focus groups or case studies. It may also be important to understand the influence of achievement goal orientation on HIP participation in a context where the participation is truly voluntary, and there are no external barriers (such as cost for study abroad) or curricular requirements (such as a business department requiring an internship for all of its majors). These external factors may be washing out some of the influence of achievement goal orientation or other internal factors, so additional research that includes these variables is needed. Another consideration in the implications of this research is the effect of COVID on HIP accessibility and experiences. The data in this study was collected several years prior to the pandemic, and the field is only just beginning to understand the greater impact of the disruption to higher education and subsequent pivot to online or hybrid experiences (or complete suspension, as in the case of study abroad); thus, more research is needed with post-2020 data.

This study adds to the research supporting achievement goal orientation as one factor in how students experience their education. Institutions looking to increase mastery-approach orientation within their students might develop curricular and programming interventions to promote these goals. Faculty who supervise HIPs could adapt the interventions for promoting mastery goals that have been successful in K-12 settings (Elliot & Hulleman, 2017; Linnenbrink, 2005; Marjanović et al., 2019; Post & van der Molen, 2021), making sure to encourage positive self-talk as well as designing tasks that are moderately challenging, inquiry-based, and optimize student choice regarding topic, off-campus site, type of organization, etc. to stimulate their intrinsic motivation. As some HIPs have an accompanying grade and course credit while others are optional, administrators might also consider updating policies related to grades and HIPs so as to de-emphasize grades in favor of encouraging students to participate in HIPs of interest and focus on mastery of the corresponding skills and content knowledge.

Given the demonstrated benefits of HIPs (Kuh, 2008), we should encourage students with all types of all achievement goal orientation to engage in these experiences. These findings may also help guide faculty, advisors, and administrators to better develop and implement HIP experiences that reach a wide variety of students. This may mean focusing efforts to include students who do not traditionally gravitate towards HIP participation or updating program features to encourage the broadest participation possible. This goal also implies further support for resource allocation

for HIP implementation, since HIPs are often time- and labor-intensive not just for the participating students, but also for the supervising faculty and other involved parties in the community. As institutional leaders plan how they will distribute resources in the development of HIPs on their campuses, they should keep in mind that various factors influence student participation in HIPs and that some students may be more in need of programs to enhance their educational journeys.

Author Notes

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Funding statement: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
Conflict of interest: The author declares no conflict of interest.
Ethical approval: The data collection and analysis adhere to all human subject guidelines, as specified by the Institutional Review Board at the author's institution, as well as with the Institutional Review Boards of all institutions participating in the study. Informed consent was obtained from all individual participants included in the study.
Data availability statement: The NSSE data set is proprietary and not currently available for free public use. Syntax for all analyses included in this paper are available from the author upon request.

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Appendix A. *Description of independent variables*

Variable	Description
Institution-reported sex [a]	0 = Female; 1 = Male
Transfer Status [a]	0 = Started at current institution; 1 = transfer student
Enrollment status [a]	0 = Part-time; 1 = Full-time
First-generation status [a]	0 = At least one parent earned a bachelors degree; 1 = Neither parent earned a bachelors degree
Age	Continuous variable for age
SAT/ACT score	Continuous variable for combined ACT and SAT scores (ACT converted to SAT)
Control [a]	0 = Public; 1 = Private
Enrollment size	Continuous variable for the total number of undergraduate enrollment
Race or ethnicity [a]	American Indian; Asian, Asian American; Black, African American; Latinx, Hispanic; Native Hawaiian or Other Pacific Islander; Prefer not to respond; Unknown/Other race or ethnicity; Multiracial; White [b]
Major field [a]	Biological Sciences, Agriculture, & Natural Resources; Physical Sciences, Mathematics, & Computer Science; Social Sciences; Business; Communications, Media & Public Relations; Education; Engineering; Health Professions; Social Service Professions; Other Majors; Undecided; Arts & Humanities [b]
Earned college grades [a]	Mostly As [b]; Mostly Bs; Mostly Cs
Percentage of courses taken online	Continuous variable for the percentage of courses taken online
Honors program or honors college participation [a]	0 = No; 1 = Yes
Achievement goal orientations: Mastery-approach; mastery-avoidance; performance-approach; performance-avoidance	Continuous variables for each subscale (ranging from 3 to 15)

[a] Coded as a dichotomous variable (0 = not in group; 1 = in group); [b] Reference group

Appendix B. *Full binary logistic regression model details for first-year students*

	Learning Community		Research with Faculty		Service Learning	
	Odds Ratio	Sig.	Odds Ratio	Sig.	Odds Ratio	Sig.
Step 1: Control Variables						
Male	0.988	.905	1.360	.083	**1.182**	.048
Transfer Status	0.824	.332	0.907	.777	0.950	.728
Enrollment Status	1.887	.329	2.355	.446	2.115	.064
First-generation Status	**0.769**	.008	0.798	.195	1.088	.287
Age	0.942	.311	0.990	.894	0.959	.206
ACT/SAT Score	**1.002**	<.001	**0.998**	.005	**0.998**	<.001
Private Institution	**5.305**	<.001	1.048	.863	**0.740**	.026
Institution Size	**1.092**	<.001	0.989	.433	1.001	.894
Race: American Indian[1]	1.449	.598	1.882	.555	2.620	.162
Race: Asian[1]	**0.531**	.004	0.852	.697	1.249	.208
Race: Black/African American[1]	1.186	.290	1.439	.134	1.081	.556
Race: Hispanic/Latinx[1]	**0.315**	<.001	0.509	.057	0.919	.497
Race: Pacific Islander[1]	0.776	.768	0.000	.999	2.476	.306
Race: Prefer not to respond[1]	1.002	.995	**2.471**	.025	1.195	.497
Race: Other race/ethnicity[1]	0.710	.503	0.325	.289	1.561	.274
Race: Multi-racial[1]	**0.494**	<.001	0.906	.758	0.910	.497
Major: Bio Sci.[2]	0.972	.898	0.807	.551	0.922	.647
Major: Phys. Sci.[2]	1.002	.993	**0.312**	.030	0.784	.219
Major: Social Science[2]	0.761	.260	0.452	.070	0.816	.272
Major: Business[2]	1.321	.171	0.831	.573	1.014	.935
Major: Comm.[2]	1.060	.833	1.103	.813	0.814	.355
Major: Education[2]	1.110	.683	0.442	.088	**1.519**	.042
Major: Engineering[2]	1.498	.071	0.572	.161	0.999	.998
Major: Health Prof.[2]	1.397	.100	0.798	.498	1.213	.241
Major: Soc. Serv. Prof.[2]	1.416	.177	0.881	.756	1.284	.239
Major: Other[2]	1.567	.110	0.580	.288	**2.092**	.003
Major: Undecided[2]	0.571	.185	0.385	.216	1.266	.410
College grades-mostly B's[3]	0.950	.628	**0.685**	.043	1.040	.654
College grades-mostly C's [3]	**0.655**	.022	0.655	.145	1.104	.455
Percent of online courses	**1.009**	.033	**1.012**	.028	0.999	.703
Honors college status	**1.305**	.030	**1.560**	.030	**1.477**	<.001
Step 2						
Mastery-avoidance	1.027	.189	**1.127**	.002	1.032	.051
Mastery-approach	1.049	.068	**0.905**	.034	0.995	.797
Performance-avoidance	0.971	.219	**0.889**	.006	**0.945**	.004
Performance-approach	1.017	.529	1.092	.066	1.034	.126

[1] Reference group: White; [2] Reference group: Arts & Humanities majors; [3] Reference group: College grades-mostly A's
Note: Significant coefficients are bolded

Appendix C. *Full binary logistic regression model details for seniors (Part 1)*

	Learning Community		Research with Faculty		Service Learning	
	Odds Ratio	Sig.	Odds Ratio	Sig.	Odds Ratio	Sig.
Step 1: Control Variables						
Male	0.835	.067	1.010	.926	0.882	.202
Transfer Status	**0.531**	<.001	0.837	.149	**0.676**	<.001
Enrollment Status	1.252	.189	0.973	.875	0.971	.851
First-generation Status	0.930	.446	1.023	.827	1.044	.659
Age	**0.902**	<.001	0.978	.261	0.988	.425
ACT/SAT Score	1.000	.540	1.000	.839	**0.999**	<.001
Private Institution	**2.571**	<.001	0.896	.520	1.356	.081
Institution Size	**1.051**	<.001	**0.968**	<.001	**0.982**	.026
Race: American Indian[1]	0.316	.299	2.092	.361	0.576	.489
Race: Asian[1]	0.950	.838	0.890	.670	1.225	.442
Race: Black/African American[1]	1.364	.090	0.982	.925	0.876	.486
Race: Hispanic/Latinx[1]	0.739	.096	0.754	.173	1.216	.266
Race: Pacific Islander[1]	0.000	.999	0.000	.999	0.000	.999
Race: Prefer not to respond[1]	1.468	.092	0.985	.952	0.756	.219
Race: Other race/ethnicity[1]	1.152	.738	0.386	.098	0.730	.479
Race: Multi-racial[1]	0.878	.465	0.819	.307	1.210	.291
Major: Bio Sci.[2]	1.201	.358	**1.939**	.001	**0.664**	.025
Major: Phys. Sci.[2]	1.085	.752	**2.192**	.001	**0.516**	.003
Major: Social Science[2]	1.408	.082	**1.698**	.006	1.291	.174
Major: Business[2]	**1.730**	.002	**0.480**	<.001	1.328	.089
Major: Comm.[2]	1.442	.142	0.970	.905	**2.292**	.002
Major: Education[2]	**2.947**	<.001	**0.597**	.024	**3.265**	<.001
Major: Engineering[2]	**2.795**	<.001	1.078	.707	**0.629**	.011
Major: Health Prof.[2]	**2.644**	<.001	0.852	.382	**3.104**	<.001
Major: Soc. Serv. Prof.[2]	**1.657**	.045	0.636	.103	**2.588**	.001
Major: Other[2]	**2.036**	.003	0.691	.172	**1.855**	.008
Major: Undecided[2]	2.814	.295	**7.476**	.045	1.046	.962
College grades-mostly B's[3]	1.073	.489	**0.620**	<.001	0.827	.072
College grades-mostly C's [3]	0.653	.052	**0.350**	<.001	**0.659**	.032
Percent of online courses	0.996	.155	**0.994**	.041	0.997	.178
Honors college status	**1.322**	.018	**2.029**	<.001	**1.710**	<.001
Step 2						
Mastery-avoidance	0.967	.070	1.012	.548	0.993	.724
Mastery-approach	**1.059**	.015	**1.108**	<.001	**1.096**	<.001
Performance-avoidance	0.996	.841	0.980	.366	1.016	.461
Performance-approach	**1.054**	.030	0.974	.299	**0.938**	.010

[1] Reference group: White; [2] Reference group: Arts & Humanities majors; [3] Reference group: College grades-mostly A's
Note: Significant coefficients are bolded

Appendix D. *Full binary logistic regression model details for seniors (Part 2)*

	Internship		Study Abroad		Capstone		Formal Leadership	
	Odds Ratio	Sig.	Odds Ratio	Sig.	Odds Ratio	Sig.	Std. β	Sig.
Step 1: Control Variables								
Male	**0.694**	<.001	**0.773**	.045	1.077	.443	**0.754**	.003
Transfer Status	**0.669**	<.001	**0.542**	<.001	**0.600**	<.001	**0.486**	<.001
Enrollment Status	**1.496**	.009	0.883	.575	1.057	.711	1.100	.552
First-generation Status	0.897	.252	0.864	.247	0.860	.099	0.882	.173
Age	**0.945**	.001	0.947	.079	**0.963**	.016	**0.912**	<.001
ACT/SAT Score	**1.001**	.007	**1.001**	<.001	1.000	.851	**1.001**	<.001
Private Institution	**2.265**	<.001	**1.809**	.008	1.094	.579	0.768	.099
Institution Size	**1.027**	.001	**1.027**	.023	0.988	.121	0.962	<.001
Race: American Indian[1]	**0.105**	.042	0.000	.999	0.528	.425	1.254	.777
Race: Asian[1]	**0.611**	.048	0.967	.919	**0.605**	.038	1.129	.624
Race: Black/African American[1]	1.054	.768	**1.747**	.020	1.147	.441	**1.434**	.042
Race: Hispanic/Latinx[1]	**0.465**	<.001	1.072	.776	**0.421**	<.001	0.933	.702
Race: Pacific Islander[1]	0.000	.999	0.000	.999	0.000	.999	0.000	.999
Race: Prefer not to respond[1]	**0.576**	.014	1.023	.940	0.719	.132	1.030	.896
Race: Other race/ethnicity[1]	**0.432**	.044	0.763	.669	**0.379**	.018	0.986	.972
Race: Multi-racial[1]	**0.593**	.002	0.747	.232	0.773	.122	1.092	.610
Major: Bio Sci.[2]	0.821	.287	**0.319**	<.001	**0.593**	.005	0.947	.771
Major: Phys. Sci.[2]	0.943	.799	**0.211**	<.001	0.799	.336	1.059	.808
Major: Social Science[2]	1.279	.185	0.788	.263	0.992	.966	0.939	.736
Major: Business[2]	1.349	.073	0.849	.388	1.033	.848	**1.457**	.025
Major: Comm.[2]	**2.446**	<.001	0.977	.931	1.264	.358	**2.881**	<.001
Major: Education[2]	**3.083**	<.001	**0.383**	<.001	0.728	.126	1.077	.716
Major: Engineering[2]	**3.572**	<.001	**0.303**	<.001	0.994	.974	1.373	.087
Major: Health Prof.[2]	**1.703**	.002	**0.359**	<.001	**0.515**	<.001	**0.685**	.028
Major: Soc. Serv. Prof.[2]	**3.643**	<.001	**0.309**	.001	**0.534**	.009	1.117	.648
Major: Other[2]	**2.605**	<.001	**0.319**	.002	1.067	.777	1.424	.128
Major: Undecided[2]	2.743	.318	3.525	.192	1.150	.885	0.580	.639
College grades-mostly B's[3]	**0.767**	.010	0.842	.203	**0.817**	.042	0.885	.222
College grades-mostly C's [3]	**0.423**	<.001	**0.411**	.012	**0.600**	.007	0.832	.354
Percent of online courses	0.997	.256	0.998	.528	1.000	.999	0.997	.265
Honors college status	1.126	.349	**1.959**	<.001	**1.361**	.013	**1.449**	.002
Step 2								
Mastery-avoidance	0.974	.170	0.960	.083	0.989	.531	0.998	.897
Mastery-approach	1.047	.053	**1.064**	.037	**1.069**	.003	**1.079**	.001
Performance-avoidance	0.976	.273	0.997	.910	1.005	.809	**0.950**	.015
Performance-approach	1.022	.381	0.981	.521	1.017	.470	**1.049**	.045

[1] Reference group: White; [2] Reference group: Arts & Humanities majors; [3] Reference group: College grades-mostly A's
Note: Significant coefficients are bolded