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What High-Impact Practices Work for Minoritized Students? Institutional Inequities in College Learning Opportunities and Outcomes

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Abstract: This mixed-methods study examines what high-impact practices (HIPs) help improve the chances of college and career success among minoritized students. Building on transformative and ecological perspectives of HIPs, the study tracks U.S. 4-year college students' learning opportunities towards bachelor's degree completion followed by job employment or graduate/professional school enrollment. It explores a more comprehensive and diverse set of HIPs: academic and sociocultural engagement, study abroad, foreign language, co-op/internship, student teaching, advanced math and writing courses, research, and volunteer activities. Statistical analyses of the Beginning Postsecondary Students (BPS) data reveal racial and socioeconomic inequities in HIP participation among different types of institutions, with relatively favorable opportunities and outcomes in private or research (doctorate-granting) universities. The qualitative analyses of college student interviews offer insights into the questions of why and how HIPs work (or not) for minoritized students. The study gives evidence-based policy guidelines for improving minoritized students' college and career success by tackling institutional inequities in high-impact practices and learning opportunities.

Keywords: high-impact practices; college success; career success; racial inequities; minoritized students

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While American students' postsecondary education access has improved significantly over the past decades, there remain substantial disparities in college degree completion. Recent data show that disparities still persist across racial and socioeconomic lines in terms of college graduation rates; the 2020 6-year graduation rate for White students was 70%, whereas for Black and Hispanic/Latinx students it was 52% (The Education Trust, 2020) [1]. This college education gap has a contrasting bearing on the students' future chances of job employment and household income, thus perpetuating preexisting inequities [2,3]. Earning power for those with college degrees is 84% higher when compared with those who hold a high school degree; bachelor's degree holders will earn USD 1.2 million more over their lifetimes than those holding high-school diplomas [4]. Even for those who graduate from college, indicators of inequity are the default rates on student loans by race: 5% for White students, 28% for Black students, and 13% for Hispanic/Latinx students. The persistent inequities in college outcomes are clear indications that there is a need to address both the college-going experience as well as transitions from college to career to develop interventions that lead to more equitable outcomes.

What is often missing in this higher education inequity debate—and where we expect our study to have contributions—is an in-depth analysis of what works for minoritized students in different types of higher education institutions. Whereas previous studies have demonstrated that high-impact practices (HIPs) have a pronounced effect on the experiences of underserved students [5–8], we know relatively little about what specific HIPs work (or not) for minoritized students and how HIP-related opportunity and outcome

gaps vary among racial and socioeconomic groups in different institution types. While previous studies focused on relatively short-term effects of HIPs such as course grades and graduation, it also remains uncertain about their long-term effects on career success beyond college education (e.g., job employment and enrollment in graduate/professional school).

In light of these concerns, this study aims to explore HIP learning opportunities and outcomes for U.S. 4-year college and university students as differentiated by their race and socioeconomic status as well as their institution type. It investigates the following overarching questions: (a) what institutional and student background factors affect college students' opportunities to participate in high-impact practices?; (b) what high-impact practices affect the chances of students' college and career success?; (c) how do high-impact practices and outcomes vary among racial and socioeconomic groups in different types of institutions?; and (d) how can the higher education system tackle institutional inequities in college learning opportunities and outcomes for minoritized students?

1. Theoretical Perspectives and Prior Research

To fill in the gaps in the literature on minoritized college students' inequitable access and success, this study is theoretically grounded in transformative and ecological perspectives on high-impact college learning experiences toward student agency and success [9–11].

First, we reject the deficit model of racial and social achievement gaps and frame our study on the strength-based model of assets to advocate for educational equity among minoritized students [12]. This critical perspective posits that "minoritization" is a socially constructed process [13], and despite disadvantages associated with the societally minoritized identity, students as change agents themselves are capable of transforming their trajectories and environments [10]. Critical approaches toward counter-storytelling enlighten the hidden spots of minoritized students' nuanced experiences and success, and they help higher education institutions to create and foster transformative environments.

Second, ecological perspectives provide useful analytical tools to better understand how college students from different backgrounds learn and develop in different circumstances and also how student college experiences and outcomes are shaped by and shape multi-layered ecological systems. The nested ecological systems consist of microsystems (where direct interaction between the student and the environment takes place, e.g., classes and laboratory teams), mesosystems (where student development is embedded in co-existing microsystems, e.g., peer culture), exosystems (where indirect processes influence student development, e.g., federal and state financial aid policies), macrosystems (where student development possibilities are influenced by sociohistorical contexts, e.g., cultural expectations), and chronosystems (the times when a student lives, e.g., COVID-19 pandemic) [14,15].

Third, considering soaring concerns for college success disparities, we position high-impact practices (HIPs) at the heart of transformative college ecological systems [8]. HIPs are defined as active learning practices that promote deep learning and are data-proven to make a significant impact on college and career success. They include first-year seminars and experiences, common intellectual experiences, learning communities, writing intensive courses, collaborative assignments and projects, undergraduate research, diversity/global learning, service learning, internships, capstone courses and projects, and e-portfolios [16]. Key features involve substantial investments of students' time and effort, structured opportunities for knowledge application, reflection, and integrative thinking, meaningful contacts with faculty and peers, interactions with diverse others, chances for learning outside of the classroom, high performance standards, and public demonstrations of competence [7,17].

While we build on the conventional definitions and criteria of HIPs, we choose to expand and refine them in that college students' academic readiness and aspirations do not necessarily translate into college and career success unless their institutions fully engage students in effective academic and sociocultural activities [18]. Our expanded HIPs add academic foundation coursework that helps students build core intellectual knowledge and

skills as these advanced mathematics and writing courses are often prerequisites for success in many college courses [19]. Further, we include study abroad programs and foreign language courses as necessary for developing multicultural competence and improving global employability [20]. Thus, our definition and scope of HIPs are more comprehensive and diverse: academic and sociocultural engagement, study abroad, foreign language, co-op/internship, student teaching, advanced math and writing courses, research, and volunteer activities.

With regards to prior research findings on HIPs, the positive outcomes of traditional HIPs are widely documented, ranging from improving college knowledge [21], first-year retention [22], graduation and degree completion [23,24], graduate school enrollment and employment [25], and earning in early careers [26] to fostering personal development and social responsibility [21,27].

Specifically, robust findings are evident for real-world or service-learning HIPs including co-ops/internships, student teaching, and volunteering. Parker et al. [28] found that students who participated in internships earned significantly higher GPAs than their peers who did not, even controlling for other academic and entry characteristics. Students with internships may also be more likely to persist [29]. Student teaching, which we add as a very specific type of internship, improves job preparedness and student self-efficacy [30,31]. Furthermore, students who volunteer earned more college credits and higher GPAs and were more likely to graduate [23,32,33]. Additionally, global learning experiences inclusive of study abroad and foreign language study also assist students in becoming more adroit global citizens [34]. Foreign language study boosts academic achievement as well as employability in a global marketplace, while study abroad has a positive effect on students' intercultural competence and graduation rates, particularly for underprepared and at-risk students [20,35,36].

In addition to the promising effects of HIPs in general, mixed results on the outcomes of participation in HIPs across different studies and student groups offer nuanced insights. Positive impacts of HIPs as a whole on graduation rates found in Andrews' work [37] were reinforced in Rodenbusch et al.'s finding [24] specific to undergraduate research. For those students that do graduate, more participation in HIPs—undergraduate research in particular—has been associated with a higher likelihood of attending graduate school and a career advantage through early job attainment [25,38–40]. Especially for racially minoritized students, studies [23,32] show that service learning has been linked to higher rates of degree completion.

Conversely, a longitudinal study by Bowman and Holmes [41] found no impact of undergraduate research experiences on graduation likelihood, and Johnson and Stage [42] found that simply offering HIPs did not benefit student degree conferral at public institutions. Participation in HIPs may also demand more time outside of traditional coursework for practices such as internships, student teaching, study abroad, or volunteering, which can be problematic for non-traditional students with family obligations or in the workforce [43]. Transfer students are also less likely to participate in HIPs, perturbing the benefit these students might glean from their participation [44].

These results should be interpreted with some caution as the range of findings may also be accounted for by pre-college characteristics such as secondary academic achievement and family background and may also conceal an interaction effect, with HIPs compensating for the lack of college preparation for lower-achieving students and merely reinforcing good practices already held by high-achieving students [45,46]. Therefore, a deeper investigation on how HIPs play a role in minoritized students' college and career success remains a gap in the literature which this study intends to fill.

Further, this study addresses a need for more research on how different racial and socioeconomic groups of students fare in different types of 4-year higher education institutions. Particularly, the chance of 4-year college degree completion is much lower among low-income, minoritized students who attend non-selective colleges and universities [47]. In contrast, elite or research universities are in relatively better shape for college degree

completion and success. Still, though the selective institutions have opened their doors more widely to low-income minoritized students for the purposes of improving diversity, their policy and practice are far from being equitable as students who lack sociocultural capital often struggle for survival without adequate help [6]. Thus, we challenge the assumptions of one-size-fits-all intervention approaches and adopt instead a culturally responsive improvement strategy that considers the demographic diversity and contextual variations of the institutions as potential moderators of intervention [48].

It is important to consider the variations of high-impact practices across campuses and the unique context/climate of each campus where they occur [49,50]. Brownell and Swaner [51] discuss the barriers to generalize high-impact practices to different campuses because each of them has its own unique environment and goals: "No two campuses are the same, so the same practices on different campuses are likely to lead to different results; every program design must take into account the unique culture and goals for the individual campus." (p. 28). Another barrier is the alignment between the institution's values and strategies for engaging the whole-campus community and implementing high-impact practices [52]. As Finley and McNair [5] pointed out in their study, some underserved students need "additional guidance about how to identify high-quality high-impact experiences" (p. 30); otherwise, they may not be able to engage in high-impact practices effectively. Further research is needed to address both facilitators and barriers of HIPs for minoritized students in different types of institutions.

2. Methods

To address our research questions grounded in transformative and ecological perspectives of high-impact practices, we designed a simultaneous mixed-methods study that presents the results of quantitative and qualitative analyses of a complementary nature. For the quantitative portion of this study, we used the Beginning Postsecondary Students' (BPSs') 2004-09 data as compiled by the National Center for Education Statistics (NCES), which provides longitudinal information on students' transition from college to career and graduate education. The target population was all students in US colleges and universities who started postsecondary education in the 2003-04 academic year, and the full population file included N = 15,160 students who completed all required interviews through 2004-09. Of those students, our analytic subsample was restricted to students who ever attended 4-year colleges and universities through the 2004-09 period (n = 8642), drawn from four different types of 4-year institutions as classified by the highest degree offered, including doctoral (n = 3321), masters (n = 3086), bachelors (n = 1611), and special focus or other institutions (n = 625). We then further examined student groups by demographic and family background characteristics including sex, race/ethnicity, and parental education (see Table 1).

As a supplement to the BPSs' self-report interview data, we also analyzed the BPS transcript data collected from all eligible 4-year postsecondary institutions attended by sample members who participated in the first follow-up (BPS:04/06) and second follow-up (BPS:04/09) student interviews. Our sample data did not exclude any students who transferred between institutions during the study period. Thus, the transcript data include the transcripts of any transfer institutions identified on sample students' collected transcripts. For more detailed information on the BPS sample design and data collection procedures, we refer readers to the NCES report on BPS data methodology [53].

Having established our sample, we first examined and compared the status of college completion and then the transition to career or graduate/professional education among different groups of students. A composite variable of college degree completion and career and postgraduate education status as of 2009 (i.e., 6 years after first-time college entry) was created: 1 = not graduated and without bachelor's degree, 2 = bachelor's degree but no job or graduate school yet, 3 = bachelor's degree and employed, and 4 = bachelor's degree and enrolled in graduate/professional school.

Table 1. BPS national sample descriptive statistics for 4-year college subgroups of students.

Variables	Statistics	Institution Type			
		Doctoral	Masters	Baccalaureate	Special Focus and Other
Number of Students		3321	3086	1611	625
International student	Mean	0.02	0.02	0.01	0.01 *
	SD	0.12	0.14	0.09	0.07
First-generation immigrant	Mean	0.10	0.08 **	0.10	0.14 **
	SD	0.30	0.27	0.31	0.35
Second-generation immigrant	Mean	0.14	0.10 ***	0.09 ***	0.15
	SD	0.35	0.30	0.29	0.36
Third-generation + Native	Mean	0.74	0.80 ***	0.80 ***	0.71 *
	SD	0.44	0.40	0.40	0.46
Sex (Male)	Mean	0.46	0.41 ***	0.44	0.52 **
	SD	0.50	0.49	0.50	0.50
Age ~	Mean	18.76	19.80 ***	20.76 ***	21.82 ***
	SD	2.91	5.25	6.56	6.97
Parental education ~	Mean	6.26	5.26 ***	5.36 ***	4.34 ***
	SD	2.51	2.66	2.70	2.50
Race/ethnicity (White)	Mean	0.67	0.73 ***	0.65	0.54 ***
	SD	0.47	0.45	0.48	0.50
Race/ethnicity (Black)	Mean	0.09	0.09	0.16 ***	0.16 ***
	SD	0.29	0.28	0.37	0.36
Race/ethnicity (Asian)	Mean	0.09	0.04 ***	0.03 ***	0.03 ***
	SD	0.28	0.20	0.17	0.18
Race/ethnicity (Hispanic/Latinx)	Mean	0.09	0.10	0.11	0.21 ***
	SD	0.29	0.30	0.31	0.40
High School GPA ~	Mean	6.44	6.07 ***	6.14 ***	5.60 ***
	SD	0.81	0.99	0.98	1.28
Admissions test scores ~ (ACT/SAT)	Mean	1118.87	1014.03 ***	1024.93 ***	938.29 ***
	SD	178.93	166.52	206.86	206.53
College GPA ~	Mean	2.97	2.81 ***	2.78 ***	2.69 ***
	SD	0.72	0.84	0.90	0.94
College credits ~	Mean	111.35	94.05 ***	88.44 ***	77.91 ***
	SD	45.51	49.36	51.01	62.13
Transfer	Mean	0.22	0.28 ***	0.26 **	0.34 ***
	SD	0.41	0.45	0.44	0.47
ESL courses	Mean	0.01	0.01	0.04 ***	0.02
	SD	0.12	0.10	0.20	0.14
Remedial courses	Mean	0.28	0.43 ***	0.36 ***	0.53 ***
	SD	0.45	0.50	0.48	0.50
High-impact practices~ (Frequency of HIPs)	Mean	3.53	1.89 ***	2.11 ***	1.19 ***
	SD	1.48	1.51	1.74	1.36
Institution control (Public)	Mean	0.80	0.69 ***	0.36 ***	0.29 ***
	SD	0.40	0.46	0.48	0.45
Student loans ~	Mean	11,685.81	11,293.93	13,533.20 ***	15,447.95 ***
	SD	16,836.17	15,338.15	16,688.35	20,559.00
STEM major	Mean	0.23	0.13 ***	0.23	0.17
	SD	0.42	0.34	0.42	0.38
Bachelor's without job or graduate school	Mean	0.11	0.09 **	0.07 ***	0.07*
	SD	0.31	0.28	0.26	0.26
Bachelor's with full-time job	Mean	0.40	0.34 ***	0.31 ***	0.17 ***
	SD	0.49	0.47	0.46	0.38
Bachelor's with graduate school	Mean	0.20	0.12 ***	0.11 ***	0.03 ***
	SD	0.40	0.33	0.32	0.18

Note. Variables marked with ~ signs are continuous, whereas all the rest are binary variables. The mean value for those binary variables (dummy-coded) represents the proportion of students in that category. The group mean differences among institution types (relative to doctoral institution type as a reference group) are denoted by asterisks for statistical significance: * at the $p < 0.05$ level, ** at the $p < 0.01$ level, *** at the $p < 0.001$ level.

Second, we conducted an analysis of experiential learning factors. Based on the BPS transcript data, we measured the frequency of students' participation in high-impact practices (HIPs), that is, a combination of curricular and co/extra-curricular active learning activities consisting of study abroad, foreign language, co-op or internship, student teaching, advanced math and writing courses, research, and volunteer activities. We coded 1 (participated with credits) vs. 0 (never participated) for these transcript-based HIP activities and counted the total cumulative number of HIP activities throughout the whole period of college enrollment. In addition, HIPs of academic and sociocultural engagement were measured by the student survey questions about the frequency of participation (coded 0 for never, 1 for sometimes, and 2 for often) in the following activities: had social contact with faculty, talked with faculty about academic matters outside of class, met with an academic advisor or participated in study groups, attended fine arts activities, participated in school clubs, or participated in intramural or varsity sports. These activities were measured twice, first in 2004 (baseline) and second in 2006 (first follow-up), so we chose to take the average value of those two repeated measures. Academic and sociocultural engagement scales (composite factors) have strong internal consistency reliability with an alpha coefficient range of 0.92–0.98.

Third, we examined the relationship between HIPs and college outcomes. Based on the non-normal distribution of HIP frequency values, we grouped students into three comparably-sized categories: low (0–1 HIP, 28%), medium (2–3 HIPs, 40%), and high (4 or more HIPs, 32%) and compared their college outcomes. We tested the hypothesis that if 4-year college students engaged in high-impact practices with a mix of academic and sociocultural activities, intensive and balanced HIP experiences would improve the chance of their college completion with either full-time employment or graduate/professional school enrollment (see Figure 1).

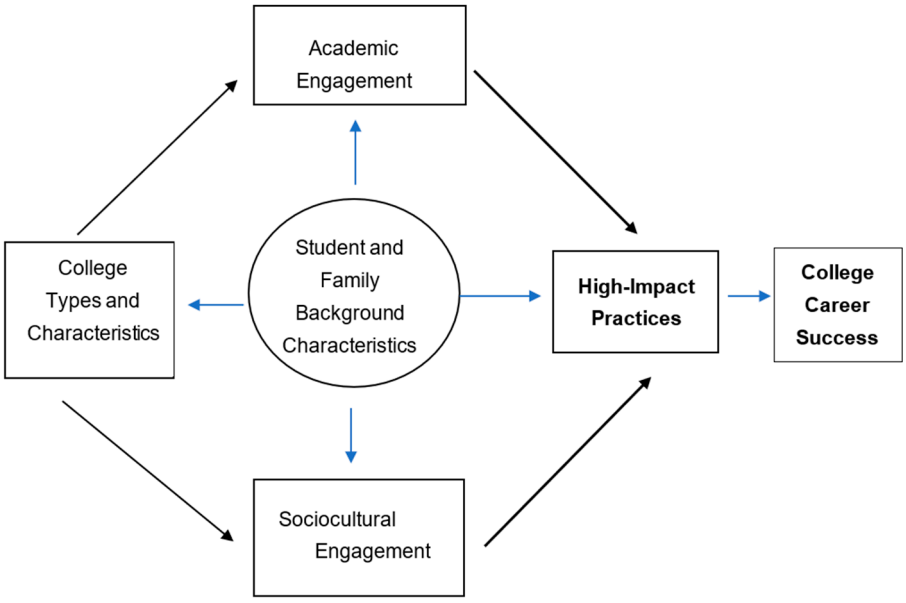

Figure 1. Diagram of hypothesized relationships between institutional type, student background, academic and sociocultural engagement, high-impact practices, and college/career success.

In addition to the total cumulative effects of HIPs, we also tested the effect of each individual HIP. Given the categorical nature of the outcome variable, we used a multinomial logistic regression model for hypothesis testing. We also employed the inverse probability of treatment weighting (IPTW) [54,55] method to implement propensity score matching among three different levels of HIPs and account for potential selection bias, allowing us to draw causal inferences about the impact of HIPs on the chances of 4-year college degree completion with full-time employment or graduate/professional school enrollment. The

final logistic regression model below takes into account demographics and institutional factors and attempts to estimate the "value-added" effects of HIPs.

$$Y_{mij} = \beta_0 + \beta_1 (HIPs)_i + \beta_2 (Student\ Backgrounds)_i + \beta_3 (Institutional\ Types)_i$$

where $Y_{mij} = \log(P_{mij}/P_{Mij})$ for which m = 1 (earned a bachelor's degree but neither employed in a full-time job nor enrolled in graduate/professional schools), 2 (earned a bachelor's degree and employed in a full-time job), and 3 (earned a bachelor's degree and enrolled in graduate/professional schools). The reference group M are those who did not finish 4-year college within six years after college entry (including dropouts and stopouts).

In addition to our secondary analysis of the BPS national sample of 4-year college students, we conducted our own surveys of undergraduate students (N = 154) and interviews of undergraduate and graduate students (n = 18) at a large public research university to construct in-depth case studies. The university that comprises the purposefully selected sample research institution was chosen among those with reputations for institutional policy towards diversification, inclusion, and internationalization, and it is ranked among the top 25 public universities in the U.S. in terms of the international student enrollment. As part of a larger study, the present study used only the interview data to address questions as to for whom and why and how HIPs work (or not), and the detailed data collection and analysis procedures are as follows.

We purposively used a stratified sample that included students who were enrolled in different academic majors and had diverse professional aspirations. The recruitment of interview participants took place via Institutional Review Board (IRB)-approved email invitations during the Fall 2019 and Spring 2020 semesters. We adapted Seidman's three-sequence interviewing protocol [56] into a single sequence that fulfilled multi-fold purposes to invite focused life history, detailed experiences, and participant reflections. We then conducted one-time semi-structured interviews in English, the primary language of instruction at the institution, either in-person or online according to the participant's preference, with each of the final interview participants (n = 18, see Table 2 for interview participant characteristics). This qualitative study sample provides good representation of minoritized student groups, including racial minorities and immigrant and international students (n = 12, two-thirds of the sample). We used NVivo 12 software and the researcher's developmental log with annotated field notes and analytical and literature memos to conduct a critical discourse analysis of the qualitative data collected with an intentional focus on student narratives and to develop cultural themes [57] that represent counter-storytelling.

Table 2. Characteristics of interview participants.

Pseudonym	Sex	Class Level	Major	Race/Ethnicity	First-Generation College (FGCS)
Mingli	Male	Undergraduate	Economics	Chinese	Non-FGCS
Hunar	Female	Undergraduate	Computer science	Indian	Unknown
Malia	Female	Undergraduate	Sociology	Indigenous American	FGCS
Alessa	Female	Undergraduate	Psychology	White	Unknown
Ben	Male	Undergraduate	History	White	Non-FGCS
Shaan	Male	Graduate	Industrial engineering	Indian	Unknown
Raksha	Female	Graduate	Computer science	Indian	Unknown
Martin	Male	Graduate	American studies	African American	FGCS
Peter	Male	Graduate	School psychology	White	Non-FGCS
Charita	Female	Graduate	Global education	Indian	Unknown
Jim	Male	Graduate	Curriculum and instruction	White	Non-FGCS
Jorge	Male	Graduate	Student affairs	Mexican American	FGCS
Lia	Female	Graduate	Student affairs	White	Non-FGCS
John	Male	Graduate	Higher education	Caribbean American	FGCS
Kariem	Male	Graduate	Global education	Sudanese American	FGCS
Cheng	Female	Graduate	Student affairs	Chinese American	Unknown
Aatish	Male	Graduate	Higher education	Bangladeshi American	FGCS
Zelda	Female	Graduate	Student affairs	White	Unknown

3. Descriptive Analysis of College Learning and Development Opportunity Gaps

Table 1 summarizes the key background characteristics of students in our study subsample by institutional type. Of the 8642 students sampled for the quantitative analysis, those students who attended doctoral granting institutions had the highest level of parental education (some years of college), had the highest average entrance GPAs (A-) and SAT scores ($\underline{x}$ = 1118.87), and were the youngest at an average age of 18.76. These students also demonstrated the highest GPAs while in college at a mean of 2.97 and enrolled in the most college credits, averaging 111.35. Baccalaureate and special focus institutions served the highest numbers of Black and Hispanic/Latinx students (16%, 11% and 16%, 21%, respectively). Special focus institutions also offered the largest number of remedial courses ($\underline{x}$ = 0.53), and students at these institutions held the most loans ($\underline{x}$ = USD 15,447.95).

Descriptive analysis of the college outcome variables reveals diverse patterns of 4-year college students' trajectories in terms of their bachelor's degree attainment, full-time employment, and graduate/professional school enrollment within 6 years of first-time college entry. A total of 71% of the students at doctoral granting universities completed their college degrees on time, whereas only 55%, 42%, and 27% of them were able to do so among master's, baccalaureate, and special focus institutions, respectively. Among those 4-year college degree completers at doctoral granting universities, 40% were employed full-time after graduation and the remaining 20% were enrolled in graduate/professional school, whereas 11% were without either a full-time job or graduate/professional school enrollment; corresponding employment or graduate enrollment numbers are all significantly lower among the other types of institutions.

Further comparison of the subgroups of 4-year college students unveils systematic inequities in learning and development opportunities with both academic and sociocultural engagement gaps by race/ethnicity and parental education across all institution types. Figure 2 shows that students at doctoral degree-granting institutions engaged in three to four HIPs on average, while those at master's and baccalaureate degree-granting institutions and those at special focus and other institutions averaged closer to two HIPs and one HIP, respectively. It is noteworthy that the racial and socioeconomic gaps are relatively smaller in doctoral degree-granting institutions than baccalaureate institutions and others. While White and Asian students engaged in roughly 0.5 more HIPs on average than their Black and Hispanic/Latinx counterparts in doctoral degree-granting institutions, in baccalaureate institutions, the gap averaged 1 HIP in favor of White and Asian students.

Some of these differences in student engagement and college outcomes are associated with students' background characteristics, such as parental education. Figure 3 shows that students with parents having attained a bachelor's degree or higher participated in HIPs at higher rates across institution types than their counterparts with parental education levels of an associate degree or lower. This gap was again most pronounced at baccalaureate institutions, where those students whose parents had earned less than a high school diploma participated in less than 1 HIP on average, while those whose parents earned a bachelor's degree or higher participated in closer to 3 HIPs. Parents who have navigated the collegiate system themselves may recognize the value of these practices and push their children toward these opportunities. They are also more likely to have knowledge of how to access these opportunities. As parental education is positively correlated with income, they may also be better able to support their children engaging in high-impact activities outside of the curriculum in lieu of working. In the following section, we use advanced statistical methods (propensity score matching) to take into account the influences of parental education and other background variables in assessing the causal impact of HIPs on student outcomes.

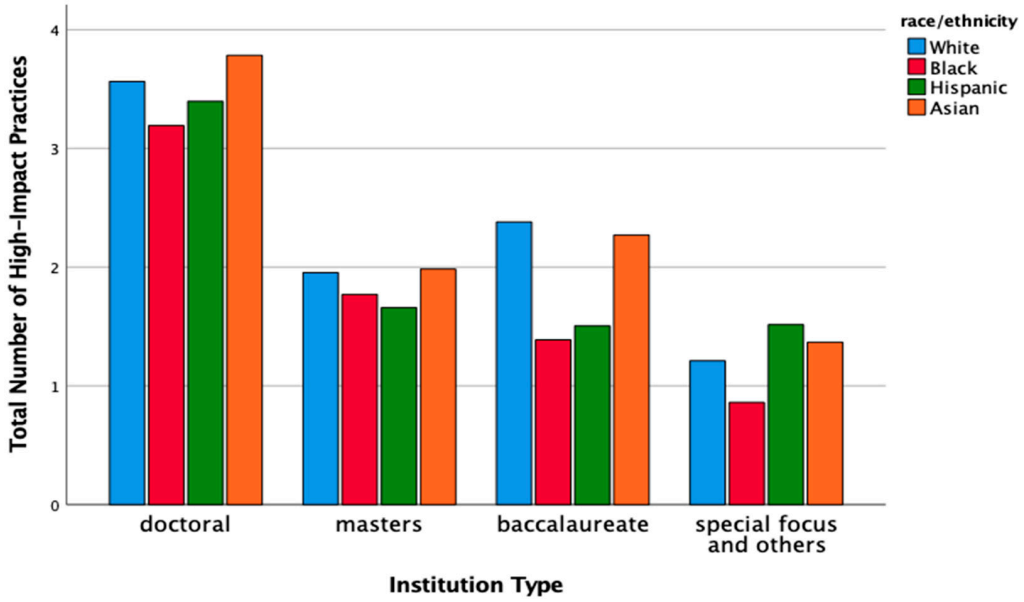

Figure 2. Racial/ethnic gaps of 4-year college learning and development opportunities by institution type: total number of high-impact practices in which students with different racial/ethnic backgrounds participated during college years (source: BPS 2004-09 data).

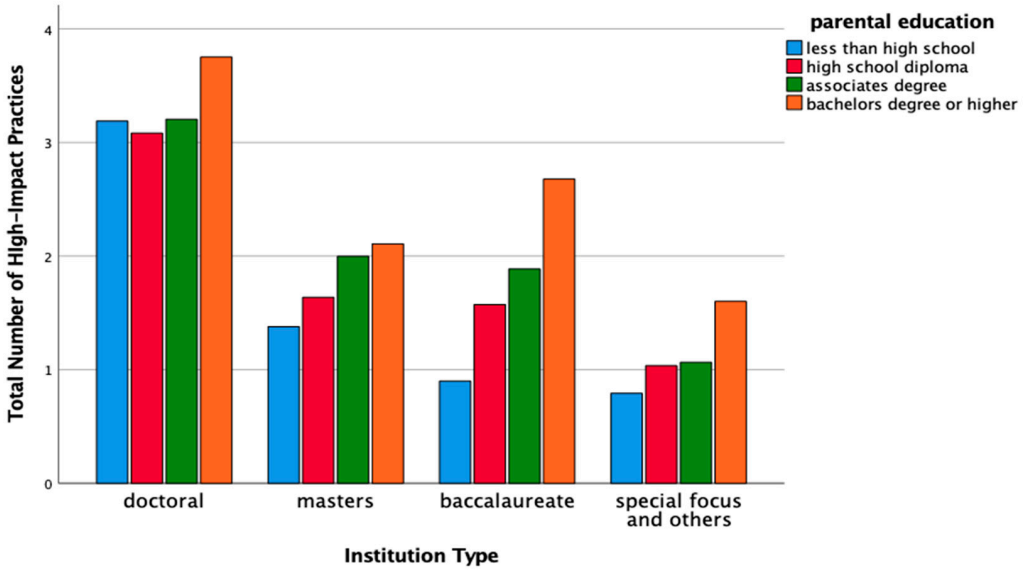

Figure 3. Socioeconomic gaps of 4-year college learning and development opportunities by institution type: total number of high-impact practices in which students with different backgrounds of parental education participated during college years (source: BPS 2004-09 data).

4. Regression Analysis of HIPs and College Outcomes

Table 3 summarizes the results of a logistic regression analysis that predicted student engagement in HIPs based on both individual and institutional background characteristics. We found that age, sex, race/ethnicity, parent education, immigrant status, high school and college GPA, SAT/ACT scores, transfer status, and institution type affected student engagement in HIPs. We summarize the results below with odds ratio values (OR) and *p*-values (*p*) for practical and statistical significance.

Table 3. Multinomial logistic regression analyses of 4-year college students' engagement in high-impact practices (HIPs).

	The Intensity of HIP Low (0–1) as Reference Group	
	Medium (2–3)	**High (4+)**
International student	1.15	1.60
First-generation immigrant	0.76	0.57 ***
Second-generation immigrant	1.04	1.12
Sex (Male)	1.07	0.83 *
Age	0.56 *	0.45 **
Parental education	1.15 ***	1.33 ***
Race (Black)	1.42 *	2.12 ***
Race (Hispanic/Latinx)	1.43 *	2.05 ***
Race (Asian)	1.25	1.43
Race (other races)	1.07	1.06
High School GPA	1.06	1.24 *
Admissions test scores (ACT/SAT)	1.26 ***	1.62 ***
Institution control (Public)	0.70 ***	0.35 ***
Institution type (Masters)	0.11 ***	0.04 ***
Institution type (Baccalaureate)	0.14 ***	0.07 ***
Institution type (Others)	0.07 ***	0.01 ***
Student loans	0.97	0.93
Transfer	0.96	0.66 ***
ESL courses	1.30	1.67
Remedial courses	1.02	0.84
College GPA	1.10	1.24 ***
College credits	2.42 ***	4.48 ***
State Fixed Effects	Yes	Yes
−2 Log Likelihood (−2LL)	11,224.72	
Likelihood Ratio χ^2 Statistic (df = 138)	3881.1 ***	

Note. Odds ratios are reported. For all comparisons, the reference category is students who have no or little (0–1) engagement in high-impact practices (HIPs) during the 4-year college period. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Controlling for other background characteristics, older students were only half as likely as their younger counterparts to engage intensively in HIPs (OR = 0.56, $p < 0.05$) and male students were less likely than female students to engage in a high number of HIPs (OR = 0.83, $p < 0.01$). Racially minoritized students in research-intensive doctoral degree-granting institutions were shown to have better learning and development opportunities in terms of HIPs than non-first-generation college and racially privileged students in other types of institutions. Black (OR = 2.12, $p < 0.001$) and Hispanic/Latinx (OR = 2.05, $p < 0.001$) students were twice as likely to engage in HIPs as their White counterparts once background characteristics were held constant; this flipped pattern of the racial gap is attributable to the inclusion of covariates in the model such as academic readiness and institution quality, variables for which Black and Hispanic/Latinx students had relative disadvantages (see below).

Further, students whose parents had higher education were more likely to engage in HIPs (OR = 1.33, $p < 0.001$). First-generation immigrants (OR = 0.57, $p < 0.001$) were less likely than native or international students to engage in HIPs, while higher high school GPA and SAT scores increased the likelihood of participating in several HIPs (OR = 1.24, $p < 0.05$). Students at doctorate-granting institutions were much more likely to engage in HIPs than their counterparts at masters (OR = 0.04, $p < 0.001$), baccalaureate (OR = 0.07, $p < 0.001$), and other institutions (OR = 0.01, $p < 0.001$), while students at private universities were also more likely to do so than those in public institutions (OR = 0.35, $p < 0.001$). On the other hand, factors such as student loan debt, participation in English as a Second Language (ESL) courses, and participation in remedial courses were not found to be significantly related to HIP engagement once other factors were controlled for.

Next, based on the estimated conditional probabilities of engagement in HIPs (i.e., propensity scores), we used the inverse probability of treatment weighting (IPTW) method to eliminate confounding effects of background characteristics and facilitate a matched comparison of college outcomes among low vs. moderate and intensive HIP groups of students. Table 4 summarizes the results of an IPTW logistic regression analysis that predicts the chances of students' college success based on the intensity of engagement in HIPs. After controlling for students' background characteristics and fixed effects, college students' engagement in several high-impact practices was a significant predictor of bachelor's degree attainment with either full-time employment or graduate/professional school enrollment 6 years after college entry.

Table 4. IPTW multinomial logistic regression analyses of the relationship between high-impact practices (HIPs) and college outcomes.

	4-Year College Education Outcomes (Non-Bachelor's Degree as Reference Group)					
	Bachelor's Degree without Full-Time Job or Graduate/Professional School		**Bachelor's Degree with Full-Time Job**		**Bachelor's Degree with Graduate/Professional School**	
	Model A	**Model B**	**Model A**	**Model B**	**Model A**	**Model B**
High-impact practice (HIP)	1.83		2.12 *		2.55 *	
Academic engagement		1.12		1.20		1.44 *
Sociocultural engagement		1.00		1.57 *		1.55 *
Study abroad		2.57 **		4.25 ***		3.68 ***
Co-op or internship		1.92 *		2.61 **		1.76
Foreign language		1.94 *		1.51		2.32 **
Advanced math courses		2.07 ***		1.59		1.86 *
Advanced writing courses		1.44 *		1.35		1.04
Student teaching		2.75 ***		3.75 ***		4.01 ***
Research		1.13		1.31 **		1.59 **
Volunteer activities		0.95		1.21		1.79 *
−2 Log Likelihood (−2LL)	255.19	3284.55				
Likelihood Ratio χ^2 Statistic	306.24 ***	655.74 ***				

Note. Odds ratios are reported. For all comparisons, the reference category is students who have not completed 4-year college for a bachelor's degree within 6 years after their first college entry. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Academic and sociocultural engagements were both associated with higher odds of attending graduate school (OR = 1.44, $p < 0.05$; B = 1.55, $p < 0.05$), and sociocultural engagement also improved the odds of holding a job after graduation (OR = 1.57, $p < 0.05$). The odds of holding a full-time job after obtaining a bachelor's were 4.25 times higher (OR = 4.25, $p < 0.001$) and the odds of attending graduate or professional school were 3.68 times higher (OR = 3.68, $p < 0.001$) for students who studied abroad than for those who did not. For students who completed a co-op or internship, the odds of holding a full-time job after graduation were 2.61 times higher (OR = 2.61, $p < 0.01$) than for those who did not, and those who took a foreign language class had odds 2.32 times higher (OR = 2.32, $p < 0.01$) of attending graduate school than their peers who did not. Student teaching improved the odds of both holding a job (OR = 3.75, $p < 0.001$) and attending graduate school (OR = 4.01, $p < 0.001$), and so did undergraduate research (OR = 1.31, $p < 0.01$ for employment; OR = 1.59, $p < 0.01$ for graduate school). Finally, volunteer activities were associated with odds of attending graduate school 1.79 times higher than for those students who did not volunteer (OR = 1.79, $p < 0.05$).

Further analyses of our sample subgroups also found that well-integrated college learning experiences, as measured by the intensity of engagement in HIPs, matter for college success across all racial and socioeconomic groups of students (see Figures 4 and 5). Particularly, engagement in four or more HIPs across academic and sociocultural domains significantly improves the chance of college and career success for all groups of students.

However, it is worth noting that the outcome gaps between racial and socioeconomic groups of students still remain significant even at a high level (i.e., four or more) of HIPs and that those outcome gaps are relatively larger in baccalaureate, masters, or special focus institutions than in doctorate-granting institutions. The IPTW regression analyses of HIP interaction effects on the chances of college and career success by race/ethnicity, parental education, and institution type confirm these patterns.

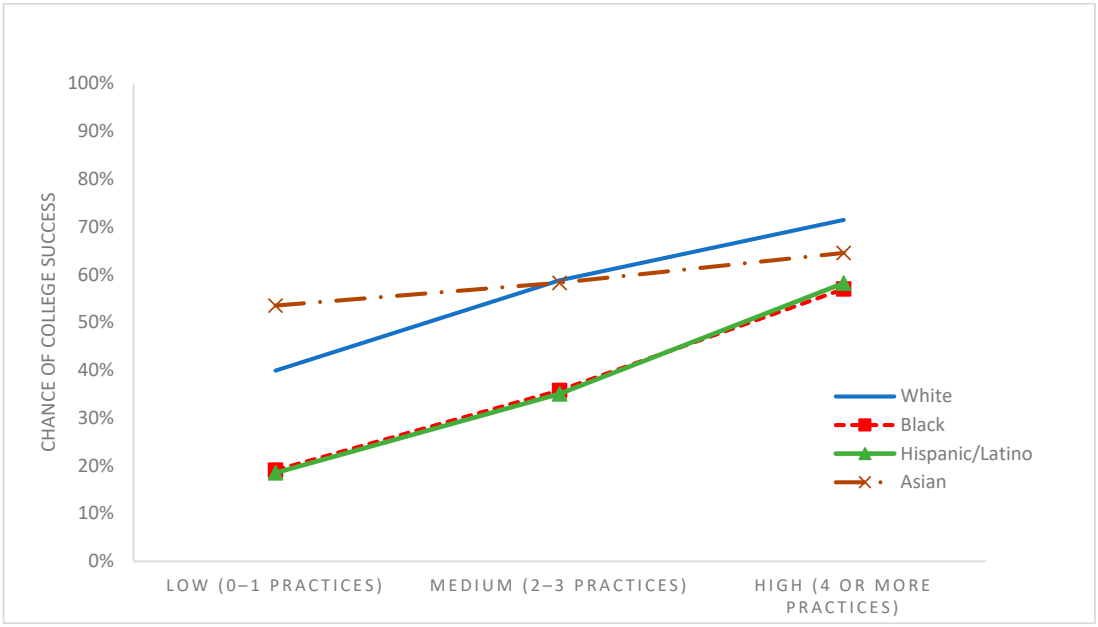

Figure 4. The relationship between the intensity of high-impact practices (HIPs) and the chance of college success by race/ethnicity. Note: The vertical axis shows the IPTW-estimated chance of bachelor's degree completers with full-time employment or graduate/professional school enrollment within 6-year time frame.

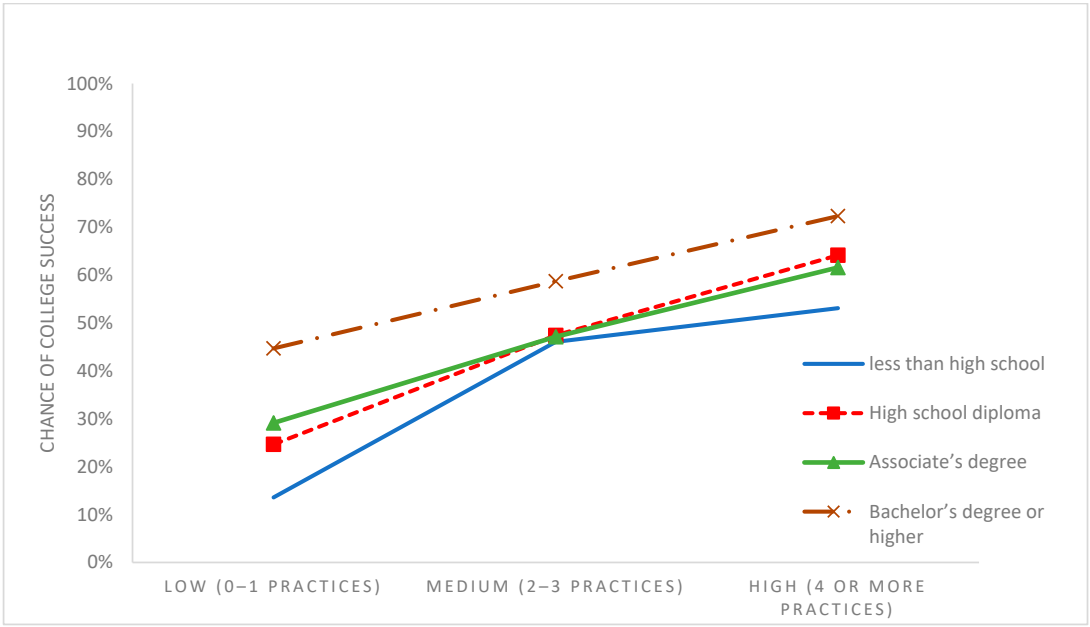

Figure 5. The relationship between the intensity of high-impact practices (HIPs) and the chance of college success by parental education. Note: The vertical axis shows the IPTW-estimated chance of bachelor's degree completers with full-time employment or graduate/professional school enrollment within 6-year time frame.

5. Qualitative Analysis of Students' Narratives

Qualitative analysis of interview cases converged to HIP-focused themes as follows: (a) college educational opportunities may look equally available but are not really equitable enough for minoritized students to learn, develop, and thrive in college; and (b) mentored and invested engagement in HIPs beyond degree requirements leads minoritized students to transform their trajectories of college education.

5.1. "Same Available but Not Equitable" Opportunities for College Success

Similar to our quantitative results, students' racial and socioeconomic privilege was made up of the social, economic, and cultural capital as well as the specific funds of knowledge transferable to college readiness and success. A cultural theme of racially and socioeconomically privileged college success was common to all six White students. Although seemingly oblivious until prompted to reflect on the role of their background on career or graduate school readiness, every one of the six racially privileged students attested clearly to the unearned advantage of Whiteness in the U.S. college ecological systems such that "things came easy (Peter)" with their "race privilege (Ben)" invisibly packed with "a lot of resources (Zelda)"and that they were able to take "things for granted (Peter)" with "no real challenges in college (Alessa and Jim)".

As a result, for example, Ben—a white male traditional college student with college-educated US-born parents who fully financed 4-year tuition for his degree at a doctorate-granting institution—engaged in five HIPs. His microsystems at the university provided him with academic and sociocultural engagement opportunities in that he "did have a lot of help from teachers, from advisors in the school" and also "from other friends from college on just how to study efficiently". Surrounded by racially privileged friends on his predominantly White campus, Ben benefitted from a "very supportive" peer and campus culture that functioned as the mesosystem that facilitated a proximal, rather than inhibiting, process toward college success. Improving soft skills such as communication, teamwork, organization, and time management through undergraduate research with professors and interaction with study groups and basketball team members, Ben completed his degree in history in four years, and expressed satisfaction with his "excellent" college experience that "really prepared" him for the law school that he "wanted" to go to. This case of privileged college success was lived by both male and female White students, although the latter group mentioned "being a woman" as a "main hurdle (Alessa)" in a macrosystem of the patriarchy.

In contrast were the stories of underprivileged college students who suffered due to a distorted focus on limitations that were often misattributed to the students rather than ecological systems around them. Instead of the college success experienced by Ben and the other privileged students, the college ecological systems faced by students minoritized in terms of race and ethnicity, socioeconomic class, sex, college generation status, immigration status, and country of origin were a constant series of "challenges" that combined sociocultural, financial, and health-related issues. The contrasting path of underprivileged college success was walked on by John—a Black Caribbean American male first-generation college student and first-generation immigrant—and Martin—a Black American male first-generation college student—as follows.

John, experiencing economic exploitation before college, chose a bachelor's degree-granting college near his immigrant family, an exosystem that would offer him an institution-wide educational opportunity program designed to support the needs of economically disadvantaged students, and had to "work twice as hard" in college. Ben's background characteristics influenced his college choice and college life. Ben's career planning that began in high school by taking AP computer sciences and college courses with good grades deviated from his original aspiration due to discouragement ("you know this particular career isn't for you. You should maybe pursue a different career. And that really left a mark on me") from a professor who played a major role in his then microsystem. Consequently, he changed his major and assimilated the macrosystemic principle that his race and socioe-

conomic status were not equitably represented in higher education and career fields such that academic and sociocultural opportunities to learn and develop were limited.

Likewise, Martin dismantled the myth of the culture of poverty and deprivation with no "problem with any of the academic work" and earned his first-generation college student identity ("Being the first person in my family to go to college, that was a lot"). The HIPs were, however, "same [equally] available but not equitable" opportunities on the Public Ivy campus that Martin first attended because the constructed environment at the predominantly white institution was too racially aggressive for the first-year minoritized student to reap the HIP benefits. The "different environment" caused him to change his major after a critical incident in which he was "sitting in [the classroom] with other students, some of them were students of color, where slavery was pictured on the wall" and ultimately to change colleges entirely and move to a different state. It is worth noting that Martin's nine-year college completion records with two major changes and two college transfers are not a story of college failure but a story of success (that continues below) earned in defiance of systemic oppression.

5.2. "I'm Very Confident That I'm Ready": Mentored and Invested HIPs for Minoritized Students

Racially and socioeconomically minoritized participants in this study did not participate in their interviews merely to vent their fear about the ecological constraints ("[Being from a rural community and speaking Spanish] I was just too scared to talk about it, what I needed because [I] couldn't really relate to my mentor from New York City (Jorge)") but to celebrate their counter-storytelling to "be ready" for career or graduate school.

For example, John's college pathway changed in his second year when he became "heavily involved in an [institution-wide] leadership program as he was mentored by a student-affairs professional in his microsystem" ("She was a very influential individual to help me understand my calling and my purpose and once she got the chance to really sit down one on one with me"). Her career-focused mentoring enabled John to expand his sociocultural engagement opportunities and secure three internships through a larger professional community that prepared him for graduate school.

Martin's late-blooming counterstory was filled with HIPs that included experiential student teaching for two years as part of his minority achievers' program designed for minoritized teachers, peer mentoring, service activities that he started to "pay it forward", and academic and sociocultural interactions with his professor, administrative staff, and TA who would "invite me to the wedding but also told me. . .don't ever let school get in the way of what you really like to do." "Self-motivated" teaching practices were integrated into additional active academic and sociocultural engagements as he has "always been one who not only enjoys learning, but enjoys teaching what I learn. . .from reading uh having mentors, like talking to other teachers and professors." Similar to John's counterstory, Martin also benefited from having in his microsystem a professor who "actually autographed it [the book that Frederick Douglas wrote] the back for my birthday" and supported him saying that "he knew that I would be great in whatever I wanted to do."

The last counterstory example that shows the transformation from disengagement to graduate school readiness was told by Malia, a Native American female first-generation college student from a low socioeconomic status household. At first, she did "not connect" to college ("I didn't grow up in an environment where I had a great example of what it meant to be professional and to be able to interact professionally"); but she later appreciated faculty members' guided "exposure" to HIPs, in particular through out-of-classroom academic conversations and further opportunities to present her work and demonstrate her strength in public. They included peer teaching, advanced writing coursework that culminated with a campus-wide writing contest award, faculty-mentored research through a federally funded scholarship program, and voluntary community service. Securing both full-time employment and graduate school enrollment after she finished her degree in communication in four years, Malia attributed her success to learning "how to interact on a team, and how to communicate. . .coming up with alternatives and solutions to challenges

that arise". Like Malia's, in conclusion, all the counterstories heard in this study highlighted their earned identity of success: "I'm very confident that I'm ready (Malia)."

6. Discussion

The increasing diversity of college student populations in the U.S. presents challenges for institutions to provide more inclusive and equitable learning and development opportunities for all students. The Association of American Colleges and Universities elevated high-impact practices as especially effective for student learning, engagement, and career preparation in the 21st century [7]. However, prior research evidence on the effect of HIPs was largely based on small-sample studies or case studies and was often limited to certain parts of the HIP package [42]. This study addresses the limitations of previous studies by tapping into the national sample along with an institutional case study and a comprehensive set of expanded HIP practices. It builds on the promise of HIPs for improving the chances of college and career success among all students, particularly minoritized students. The findings of the present study also inform and improve evidence-based institutional policy and practice towards diversity, equity, and inclusion.

In contrast with previous studies of college success that focused on the issues of students' academic engagement and achievement as measured by grades, retention, and graduation rates [19,42,58,59] our study acknowledges the broader impact of expanded college education experiences on students' lives and thus broadens the scope of quality learning and development opportunities to sociocultural engagement and co/extra-curricular "experiential" learning activities outside classrooms, including study abroad, co-op/internship, teaching, research, and service activities. Our longitudinal study also makes a unique contribution to the literature by addressing the longer-term impact of HIPs on full-time employment and graduate/professional school enrollment beyond college completion.

While the findings of this study are generally consistent with prior research on the overall potential of HIPs, the multi-fold analyses bring to light the heterogeneity of effects in that different HIP activities may have unique effects on different college outcomes. For example, internships may improve the chance of full-time employment, whereas advanced math courses may help raise the chance of graduate school enrollment. In addition, our quantitative findings reveal that student engagement in HIPs overall was relatively low, whereas the average number of HIPs varied significantly among different institution types–approximately four HIPs in doctoral institutions, two HIPs in masters or baccalaureate institutions, and one HIP in special focus institutions. Toward a goal to narrow student learning opportunity gaps and outcome gaps across different types of institutions, at least four or more of the expanded HIP activities are strongly recommended to improve the chances (70 percent or higher) of all students' college and career success.

In contrast with prior research that focused on a single institutional type, the more inclusive strategy of our study contributes to uncovering different degrees of inequities in HIP opportunities and outcomes among minoritized students in different types of 4-year colleges and universities. Particularly, the study finds the prevalence and variance in HIP engagement inequities among minoritized groups of students across all institution types, although there were relatively smaller gaps in private and doctorate-granting research universities than in public and masters, baccalaureate, or special-focus colleges and universities. From a strength-based approach, the latter type of postsecondary institutions, particularly those with a larger concentration of racially minoritized and immigrant groups, need to locally develop more diverse and flexible HIP programs that build on the strengths of their multicultural and multilingual student populations rather than assuming a deficit on the part of these students.

Further, the qualitative analyses of student engagement in HIPs in a large public research university enlighten not only multi-systemic ecological barriers that aggravate existing socially constructed disadvantages but also opportunities/strategies for minoritized students to overcome adversities and transform their pathways toward their dreams. Systemic reform efforts toward transformative college education should promote more

inclusive campus climates and more equitable access to HIPs, with early mentoring; rigorous career guidance and internship programs; teaching, research, leadership, and service opportunities; soft-skills building; and networking opportunities. Considering college students' diverse racial and socioeconomic backgrounds as well as their wide-ranging plans for career or graduate/professional education, institutions need to provide a multi-tiered (both universal and targeted) system of guidance and support for HIPs. Specifically, institutions may require a certain minimum number of HIPs (credit-bearing) for graduation among all students, while at the same time providing extra funding and programmatic support for minoritized student groups.

7. Limitations and Implications for Future Research

We acknowledge that our study has several limitations. The primary limitations of the quantitative study include the age and time frame of the data, using a secondary data set, and the self-report survey/interview about students' academic and sociocultural engagement activities. The time of data collection yields employment data from 2009; employment outcomes may have been skewed by the recession. Further, tracking students' progress beyond a 6-year time frame after college entry is desirable for future research, particularly among non-traditional part-time students. Further research is needed to update our quantitative analysis with recently released BPS data (2012-17 cohort) on the profiles of newer college student populations and to explore the longer-term effects of HIPs on their career and civic life. Further research is also needed to address the impacts of the COVID-19 pandemic crisis on minoritized students who could have experienced more inequities in education and career opportunities.

We also acknowledge the limitation of our study to capture HIP quality variations that can exist in the operationalization at the institutional level and the experience of the same at the student level. Our analysis relies on student transcript and survey data to count the frequency of HIP-relevant courses or activities, but it affords no ability to control for HIP quality and duration. To validate the consistency of high-impact practices across different types of institutions, we ran reliability analyses of survey responses and also ran correlation analyses between the HIP variable and 4-year college GPA variable for each institution type subgroup. The results showed similar ranges of reliability (Cronbach's alpha = 0.61–0.67) and predictive validity (r = 0.21–0.30, $p < 0.001$). Nevertheless, the caveat is that high-impact practices can "look" and "be" very different, even if they are classified under a common heading such as internship and study abroad programs; most schools provide those programs, but some do it far better than others. For example, the 4-year "public" institution in our qualitative study provides an optional internship program with decanal control and of varying duration, whereas another 4-year "private" institution in the same state provides a mandatory internship program with central uniform support. Thus, such quality variations in HIPs between in different types of higher education institutions must be explored in subsequent research to address "disguised" or "hidden" opportunity gaps for minoritized students.

Lastly, we acknowledge the limitation of our study to address the influences of prior educational legacy and affluency. In other words, the concern is whether all HIPs have a causal relationship with college completion/success or are simply a by-product of prior educational opportunity imposed primarily by demographics. To address this self-selection bias, we used the propensity score matching (IPTW) method to control high school GPA, SAT/ACT scores, parental education, and other demographic background variables (see Table 3). This study not only reported the importance of educational legacy in that those with parents with college degrees were more likely to engage in HIPs but also used that information to statistically control for the influence of parental education and level the playing field of HIPs. The results of the equivalence (balance) check after matching showed that statistically significant differences no longer remain in parental education among different levels of HIP groups (F = 1.76, $p = 0.17$); similarly, no more differences exist in high school GPA (F = 2.78, $p = 0.06$) and SAT/ACT scores (F = 2.45, $p = 0.09$).

Nevertheless, the caveat is that there still can be biases due to the omission of unobserved confounding variables such as students' motivation and parental support that help build better human capital and social capital; in such case, our estimate of HIP impacts on college outcomes might have been upwardly biased. Given the issue of HIP quality variation among different types of institutions, we call for further in-depth research to examine whether participation in these practices is the driver of college success rather than the symptom of prior educational legacy or privilege.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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Conflicts of Interest: The authors declare no conflict of interest.

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