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Shaping Students' Attitudes Toward Diversity: Do Faculty Practices and Interactions With Students Matter?

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Abstract

Scholars have advocated for further investigation of the campus climate for diversity and students' attitudes and behaviors surrounding diversity, and there appears to be an increasing responsibility for higher education professionals to consider ways to encourage students' awareness and acceptance of difference. Using longitudinal data from the Wabash National Study of Liberal Arts Education, this study examined the relationship between students' perceptions of faculty practices and student-faculty interactions and two measures of students' attitudes toward diversity, and whether these relationships were moderated by race/ethnicity. Findings revealed that several perceptions of faculty practices and student-faculty interactions were positively associated with students' fourth-year diversity attitudes, including: (a) quality of faculty contact; (b) faculty interest in teaching and student development; (c) how often students had discussions with faculty whose political, social, or religious opinions were different from their own; (d) how often faculty engaged students in cooperative learning activities; (e) whether courses helped students see connections between intended careers and how they affect society; and (f) whether courses helped students understand the historical, political, and social connections of past events. Overall, findings suggest that the type and quality of each faculty practice or measure of interaction with students may be significant in terms of fostering positive diversity attitudes among students. Implications for policy and practice are discussed.

The climate for diversity on college and university campuses has become a critical issue in higher education. The United States is facing rising national social movements, such as Black Lives Matter, and protests stemming from persisting systemic and structural racial

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injustices, continuing instances of police brutality toward Black Americans, and perceptions of racism and anti-Blackness permeating throughout society (Hollingsworth et al., 2020). A reemergence of racist obstacles, barriers, and suppression centering on voting rights and a rise in anti-Asian sentiments stemming from the COVID-19 pandemic are also important social and political issues facing people of color in the U.S. (Cowan, 2021; Tensley, 2021). Accordingly, college students have demonstrated greater attention to social issues centered on diversity, evidenced by their increased activism and collective action around issues of social justice (Veccaro, 2014). One recent news article about college protests noted that U.S. students are "more likely than ever to be involved in political and civic engagement" (Smith, 2017, para. 7). While students are displaying greater social agency and engagement, higher education scholars have suggested that more research is needed about how college attendance may impact diversity, equity, and inclusion-related outcomes. As college students continue to mobilize around social and political issues, and particularly around matters of diversity and inclusion, higher education leaders must understand how college experiences shape their perceptions of these critical issues.

Scholars have advocated for continued investigation of the campus climate for diversity and students' attitudes and behaviors surrounding diversity (Veccaro, 2014), and there appears to be an increasing need for higher education professionals to consider ways to encourage students' awareness and acceptance of difference, such as intercultural competence and openness to diversity. Furthermore, research has suggested that the impacts of engagement with diversity in college may differ for students from different backgrounds, particularly racial/ethnic backgrounds, where White students may benefit it additional ways from their interactions with diversity in college (Pascarella et al., 2014). These and other issues have prompted higher education scholars to continue to examine diversity on college and university campuses (Jayakumar et al., 2018) and to examine the role that students' college experiences play in fostering positive attitudes toward diversity.

According to the Association of American Colleges and Universities (AAC&U, 2019), institutions of higher education are more diverse than ever, and scholars have maintained the importance of the association between college experiences and improved diversity attitudes (Bowman, 2014). Additionally, college experiences, such as students' engagement with faculty, are also an important matter for higher education (Museus, 2014). Yet, there is little scholarly evidence about how faculty engagement and faculty teaching practices are linked to students' realized diversity attitudes. This study attends to this gap by examining the relationship between several college experiences facilitated by faculty—classroom teaching practices and interactions with students—and students' attitudes toward diversity and whether this relationship is moderated by students' race/ethnicity.

Review of Literature

Several bodies of literature provide background for this study, including research on student experiences with diversity and diversity attitudes, research on faculty teaching practices in higher education, and research on student-faculty interactions in higher education. This review of literature reveals a dearth of scholarship that has investigated the relationship between faculty practices and interactions with students and students' diversity-centered college outcomes.

Student Diversity Attitudes

As colleges and universities have increasingly made attempts to diversify their institutions, scholars have examined positive attitudes toward diversity as an important outcome higher education. Prior research has focused on the impact of college and college experiences on diversity-related attitudinal outcomes, such as intercultural competence and students' awareness and openness to racial and cultural difference. Spitzberg and Changnon's (2009) conception of diversity attitudes, framed in terms of intercultural competence, guided this research study. These authors contend that intercultural competence represents the competence of individuals and groups, from differing cultural backgrounds, that promotes or fosters shared goals. Individuals with higher levels of intercultural competence tend to have a greater capacity to find "common purpose through mutually coordinated communication across cultures and language" (p. 2). Intercultural competence is a psychological construct that can be conceptualized through theories and concepts such as universality-diversity orientation (Miville et al., 1999) or openness to diversity and challenge. Universality-diversity orientation (UDO) represents cognitive, behavioral, and affective mannerisms that promote one's proclivity toward greater awareness and acceptance of individuals' similarities and differences. Scholars assert that UDO is "an attitude toward all other persons that is inclusive, yet differentiating, in that similarities and differences are both recognized and accepted" (p. 292).

Students' experiences in college are important factors when considering realized diversity-centered outcomes. Openness to diversity has been shown to be positively linked to the diversity experiences students encounter during college, as well as other outcomes such as high-quality peer interactions and academic challenge in the classroom (Bowman, 2014). Openness to diversity has also been positively associated with civic engagement and cooperative learning experiences in college (Cabrera et al., 2002; Loes et al., 2018; Longerbeam, 2010). Prior scholarship has also shown the impact of openness to diversity, cultural awareness, and UDO on other student outcomes. In studying undergraduate students, Miville et al. (2004) found a positive association between UDO and students' attitudes and behaviors, such as self-efficacy and problem-faced coping. Additional research has supported these claims by demonstrating that openness to diversity is a significant predictor of attitudes toward diversity among college students (Strauss & Connerley, 2003). Our review of literature suggested that prior scholarship has focused primarily on the impact of diversity attitudes on cognitive, psychosocial, and other college student outcomes. Seemingly, there is less evidence about the college experiences and encounters that affect diversity attitudes, including students' perceptions of their experiences with faculty, and whether these relationships are moderated by students' race or ethnicity.

Faculty Teaching and Classroom Practices

Researchers have also examined students' experiences with faculty and whether these experiences are associated with college learning and outcomes. Effective faculty teaching practices have been associated with a host of student outcomes, including cognitive and critical thinking gains, academic motivation, and positive learning orientations (Blaich et al., 2016). For example, clear and organized classroom instruction in college has been associated with growth in critical thinking skills (Loes et al., 2015), academic motivation (Loes & Pascarella, 2015), need for cognition (Wang et al., 2015), increased educational

aspirations (Hanson, Paulsen, et al., 2016; Hanson, Trolian, et al., 2016), and lifelong learning orientations (Loes & Pascarella, 2015).

Researchers have also examined more specific faculty classroom practices, such as use of collaborative learning, faculty interest in teaching and student development, setting high expectations for students, and providing prompt feedback. Collaborative learning practices have been associated with gains in critical thinking skills (Loes & Pascarella, 2017), psychological well-being (Hanson, Paulsen, et al., 2016; Hanson, Trolian, et al., 2016), and openness to diversity (Loes et al., 2018). Faculty interest in teaching and student development has also been associated with first-year students' grade point average (Roksa et al., 2017). Instructors' high expectations and providing prompt feedback to students have been associated with increased need for cognition and positive attitudes toward literacy activities (Loes et al., 2012), as well as increased educational aspirations (Hanson, Paulsen, & Pascarella, 2016; Hanson, Trolian, et al., 2016). Despite prior research that has examined faculty practices in the classroom, studies have not examined the connection between these practices and students' attitudes toward diversity.

Student-Faculty Interactions

The literature on students' interactions with faculty in college is abundant, and scholars continue to examine these experiences to understand how they shape learning experiences and outcomes for students (Kim & Sax, 2017; Mayhew et al., 2016). Frequent and high-quality interactions with faculty in college have been positively associated with outcomes such as student retention and persistence (Dwyer, 2015; Lundquist et al., 2002; Shepherd & Sheu, 2014), academic achievement and performance (Cole, 2010; Guerrero & Rod, 2013; Kim, 2010), intellectual and cognitive development (Cruce et al., 2006; Kim & Sax, 2007, 2011; Padgett et al., 2010), student motivation and engagement (Kinzie, 2005; Rugutt & Chemosit, 2009; Trolian et al., 2016; Umbach & Wawrzynski, 2005), and increased educational aspirations (Hanson, Paulsen, et al., 2016; Hanson, Trolian, et al., 2016; Kim, 2010; Trolian & Parker, 2017).

Student-faculty interactions benefit students both inside and outside of traditional classroom contexts. It is worth noting that college students frequently have encounters with faculty outside of the classroom (e.g., undergraduate research, advising, or campus events). Similar to in-class experiences, prior research has shown positive benefits of these experiences on academic outcomes. Out-of-class student-faculty interactions have been associated with positive gains in student persistence, grade point average, and intentions for graduate study (Hathaway et al., 2002). To a lesser extent, the higher education literature has also focused on nonacademic college outcomes of students' interactions with faculty. Frequent and high-quality student-faculty interactions have been linked to higher levels of sense of belonging and student satisfaction (Einarson & Clarkburg, 2010) and personal development and well-being (Bowman, 2010; Kim & Sax, 2014; Sax et al., 2005).

While some prior research has investigated race and student-faculty interactions, we have much to learn about the moderating effects of race and ethnicity related to these experiences. A recent study examining 209 Black students at a large Southwestern predominately White institution (PWI) found a positive link between student-faculty interactions and academic and social engagement (Beasley, 2020). Additionally, one prior qualitative study of African American college students suggested student-faculty interactions may promote perceptions of racism, bias and microaggressions in students, resulting in negative

perceptions of the campus climate (Solorzano et al., 2000). Findings from this study suggested that microaggressions in academic and social spaces had a negative impact on African American students' perceptions of the campus racial climate. For Latinx students, academic-related interactions with faculty and the quality of those interactions have been positively associated with academic achievement (Anaya & Cole, 2001).

While there is abundant research on the relationship between student-faculty interactions and many important college student outcomes (see Kim & Sax, 2017; Mayhew et al., 2016), less is known about the association between students' experiences with faculty in college and diversity-centered outcomes, and generally those findings have been limited and mixed. Hurtado et al. (1998) noted that "research on the impact of college on students' racial attitudes, cultural awareness/acceptance, and social/political attitudes suggests that faculty may have a larger, more important role than traditionally believed" (p. 286). According to Bowman (2014), some prior research has found that students' interactions with faculty are unrelated to openness to diversity (Longerbeam, 2010; Reason et al., 2010), while other studies have found that these relationships are occasionally positive (Whitt et al., 2001) or even negative (Pike, 2002). Much of the prior literature about the association between faculty practices, student-faculty interactions, and diversity attitudes has centered on what occurs in the classroom and curricular activities and encounters. Teaching practices, instruction, class presentations, and in-class discussions have been shown to influence attitudes and encounters centering on difference (Ryder et al., 2016). Largely, prior literature provides evidence that faculty members' approach to learning, comprising what is included (or excluded) in their pedagogical approaches, content, and course activities may impact students' attitudes toward diversity and openness to diversity (Pascarella & Terenzini, 2005).

Theoretical Framework

Several frameworks guided the present study. Broadly, theoretical perspectives related to the impact of college on students served as a foundation for the research design. Astin (1993) asserted that college students may experience substantial changes during college regarding their values and attitudes. Similarly, Pascarella and Terenzini (2005) asserted that many college students experience deviations in their racial and ethnic-centered values and attitudes. Furthermore, Pascarella (1985) offered a model of student change during college, suggesting several potential influences that should be controlled for when examining the relationship between college experiences and college outcomes, including students' background characteristics, institutional contexts and environments, interactions with agents of socialization, and the quality of student effort all have the potential to influence student change in college and subsequent college outcomes. Thus, Pascarella's framework helped to guide statistical modelling and the selection of control variables for the current study. This study highlights important college experiences that have the potential to influence socially constructed values and attitudes in students; however, we note that faculty practices and interactions with students may not be the sole environmental factor influencing diversity outcomes, but rather a single (but critical) contributing factor.

Central to this study is the question of how and when students acquire and learn the attitudes that they exhibit. Symbolic politics theory is a theoretical framework that explains the acquisition of attitudes over time or across the lifespan (Sears, 1993; Sidanius et al., 2008). It highlights the existence of varying strengths of political

predispositions among individuals that range from "symbolic predispositions" (i.e., strong proclivity to racial and ethnic attitudes) to "non-attitudes" (i.e., weak proclivity to racial and ethnic attitudes). This framework underscores the notion of lifelong learning moments that impact individuals' values, attitudes, and beliefs about diversity, race, and ethnicity. We utilized these theoretical underpinnings to conceptualize the relationships examined in this study, as well as covariates that may influence our outcomes of interest. Contextualized to this study, the environmental element of college-going, including interactions with faculty and exposure to faculty teaching practices, provides a salient intervention for students' actualized diversity outcomes.

Purpose of the Study

Given an increasingly diverse U.S. citizenry and increased student diversity at institutions of higher education, it is critical to understand experiences that may help to promote positive diversity attitudes among students. Additionally, it is important to consider the role that college faculty may play in helping to promote positive attitudes toward diversity, both inside and outside of the classroom. Given the aforementioned limited and mixed findings, this study examines the relationship between students' perceptions of faculty practices and student-faculty interactions and two measures of students' attitudes toward diversity. The following research questions guided this study: (1) Are faculty practices and student-faculty interactions in college associated with students' positive fourth-year attitudes toward diversity, including openness to diversity and challenge and students' universal-diverse orientation? and (2) Are these relationships moderated by students' race/ethnicity?

This study contributes to the higher education literature in several important ways. First, this study considers two different measures to assess different dimensions of students' diversity attitudes—a scaled measure of openness to diversity and challenge and the Miville-Guzman Universality-Diversity Scale (measuring universal-diverse orientation). The openness to diversity scale was designed to measure students' interest in exploring diversity in culture, ethnicity, perspectives, values, and ideas, while the Miville-Guzman Universality-Diversity Scale (Miville et al., 1999) was designed to measure students' awareness and acceptance of differences among people. Second, this study considers 10 different measures of students' perceptions of faculty practices and student-faculty interactions to more closely examine the type and context of students' experiences with faculty in college. By considering the type and context of faculty practices and interactions with students, we are able to draw conclusions about which types of experiences with faculty are most salient in fostering students' diversity attitudes and make clearer recommendations for institutional practice. Third, much of the prior scholarship has centered on the impact of diversity attitudes on college student outcomes. This study contributes to literature by examining diversity attitudes as an outcome measure, i.e. the impact of faculty encounters on diversity attitudes. Finally, this study uses longitudinal data to consider changes in students' diversity attitudes over four years of college, using a precollege measure of each diversity attitudes measure to isolate changes in these attitudes during students' first four college years.

Methods

Data and Sample

Data are from the Wabash National Study of Liberal Arts Education (WNS), a longitudinal, multi-institutional study of experiences and outcomes associated with a liberal arts education. The WNS included more than 50 colleges and universities from across the United States, and institutions were selected to participate to ensure a range of diverse institutional types. As such, the WNS included 2-year and 4-year colleges and universities, public and private institutions, single-sex colleges, and historically Black colleges and universities (HBCUs). Additionally, WNS institutions ranged in terms of institutional size, selectivity, tuition cost, and patterns of student residence. As the WNS was interested in experiences associated with a liberal arts education, liberal arts colleges were purposefully overrepresented in the WNS institutional sample.

The WNS student sample included first-time, full-time undergraduates attending one of the institutions included in the study who were enrolled from 2006 to 2010 (2010 Cohort), 2007 to 2011 (2011 Cohort), and 2008 to 2012 (2012 Cohort). The WNS collected data from student participants at three separate assessment points across students' first four years of college. At the first assessment point, which occurred at the beginning of students' first year of college, student participants completed a questionnaire about their backgrounds and prior educational experiences and also completed a series of instruments designed to measure several college outcomes (precollege pretest). These outcomes instruments included measures of students' precollege critical thinking skills, moral reasoning ability, leadership skills, attitudes toward civic engagement, and attitudes toward diversity. At the second assessment point, which occurred at the end of students' first year of college, student participants completed a questionnaire about their college experiences and repeated the series of college outcomes instruments (first-year posttest). Finally, at the third assessment point, which occurred at the end of students' fourth year of college, student participants repeated the questionnaire about their college experiences and also repeated the series of college outcomes instruments (fourth-year posttest). This study uses data from the first and third assessment points, to consider change over four years of college.

The sample used in this study includes student participants from all three WNS cohorts (2010, 2011, and 2012) who attended one of the 4-year colleges/universities, including seven research universities, nine regional universities, and 30 liberal arts colleges. Of the 17,195 WNS participants, 6,236 participated at the first and third assessment points, for an overall response rate of 36.2%. After narrowing the sample to include only students who attended a 4-year institution and using listwise deletion to account for missing data, usable data were available for 3976 participants. Table 1 presents descriptive statistics for all variables. The student sample was 61% female and 39% male. Of the sample's participants, 6% were Asian/Asian American/Pacific Islander, 5% were Black/African American, 5% were Latinx/Hispanic, and 84% were White/Caucasian. The sample was comprised of 24% first-generation students and 76% continuing-generation students. Fifty-nine percent of the sample attended a liberal arts college, 16% attended a regional college or university, and 25% attended a research university. Of the sample's participants, 27% majored in a STEM field; 50% majored in an arts, humanities, or social sciences field; and 23% majored in a professional field.

Table 1 Descriptive statistics ($n = 3976$)

Variable	Mean	Standard deviation	Range
Background characteristics			
Sex: Male (vs. Female)	0.39	0.48	0.00–1.00
Race/ethnicity: Asian/Pacific Islander (vs. White/Caucasian)	0.06	0.24	0.00–1.00
Race/ethnicity: Black/African American (vs. White/Caucasian)	0.05	0.23	0.00–1.00
Race/ethnicity: Hispanic/Latino/a (vs. White/Caucasian)	0.05	0.22	0.00–1.00
Parent education: 4-year degree or higher (vs. Less than a 4-year degree)	0.76	0.43	0.00–1.00
Precollege characteristics and attitudes			
Precollege academic ability	0.00	1.00	−4.35–2.05
Precollege academic motivation	0.00	1.00	−4.44–2.55
High school involvement	0.00	1.00	−5.07–2.36
Precollege political views	0.00	1.00	−1.97–2.56
Precollege openness to diversity and challenge	0.00	1.00	−4.80–1.73
Precollege universal-diverse orientation	0.00	1.00	−5.23–2.17
Institutional characteristics			
Institutional type: regional university(vs. Liberal arts college)	0.16	0.37	0.00–1.00
Institutional type: research university (vs. Liberal arts college)	0.25	0.43	0.00–1.00
Barron's institutional selectivity score	0.00	1.00	−2.05–1.35
Institutional size	0.00	1.00	−0.77–3.42
Other college experiences			
Arts, humanities, or social science major (vs. STEM major)	0.50	0.50	0.00–1.00
Professional major (vs. STEM major)	0.23	0.42	0.00–1.00
Average college grades	0.00	1.00	−4.13–1.22
Academic effort and engagement	0.00	1.00	−2.13–1.85
Hours of paid employment	0.00	1.00	−1.04–6.53
Hours of cocurricular involvement	0.00	1.00	−1.15–3.26
Number of diversity courses taken in college	0.00	1.00	−1.44–2.75
Participation in diversity workshops and programs	0.00	1.00	−2.39–3.37

Table 1 (continued)

Variable	Mean	Standard deviation	Range
Positive diversity interactions scale	0.00	1.00	−2.14–2.10
Students' perceptions of faculty practices and student-faculty interactions			
Frequency of student-faculty contact	0.00	1.00	−2.40–2.26
Quality of student-faculty contact	0.00	1.00	−3.85–1.29
Worked on a research project with a faculty member (vs. Did not work on a research project with a faculty member)	0.35	0.48	0.00–1.00
Discussed a personal problem/concern with a faculty member (vs. Did not discuss a problem/concern with a faculty member)	0.62	0.49	0.00–1.00
Faculty willingness to spend time outside of class	0.00	1.00	−4.18–0.89
Faculty interest in teaching and student development	0.00	1.00	−5.06–1.33
Frequency of discussions with faculty whose political, social, or religious opinions were different from their own	0.00	1.00	−1.41–2.04
Faculty engaged students in cooperative learning activities	0.00	1.00	−2.93–2.08
Courses have helped the student see connections between their intended career and how it affects society	0.00	1.00	−2.91–1.10
Courses have helped the student understand historical, political, and social connections of past events	0.00	1.00	−2.98–1.19

All continuous variables are standardized

Variables

Dependent Variables

The dependent variables of interest in this study were two scales measuring students' attitudes toward diversity. The first measure of students' attitudes toward diversity was openness to diversity and challenge. This was measured using a 7-item scale ($\alpha = 0.87$) that evaluated students' interest in exploring diversity in culture, ethnicity, perspectives, values, and ideas. Items included: (a) I enjoy having discussions with people whose ideas and values are different from my own, (b) The real value of a college education lies in being introduced to different values, (c) I enjoy talking with people who have values different from mine because it helps me better understand myself and my values, (d) Learning about people from different cultures is a very important part of my college education, (e) I enjoy taking courses that challenge my beliefs and values, (f) The courses I enjoy most are those that make me think about things from a different perspective, and (g) Contact with individuals whose backgrounds (e.g., race, national origin, sexual orientation) are different from my own is an essential part of my college education.

The second measure of students' attitudes toward diversity was universal-diverse orientation. This was measured using the 15-item Miville-Guzman Universality-Diversity Scale ($\alpha = 0.80$) that evaluated students' awareness and acceptance of both similarities and differences among people (Miville et al., 1999). This scale measured three factors: relativistic appreciation of oneself and others, which involves the recognition and acceptance of the similarities and differences among people; comfort with differences, which assesses the degree to which individuals feel comfortable around those who are different from themselves; and diversity of contact, which assesses both previous and intended behaviors regarding interpersonal contact with people of different demographic backgrounds. Items are available by request from the scale authors (Miville et al., 1999).

Independent Variables

This study used 10 measures of students' experiences with faculty to measure their perceptions of faculty practices and self-reported student-faculty interactions, each assessed at the end of the fourth year of college. These included: (a) frequency of faculty contact (4-item scale; $\alpha = 0.70$); (b) quality of student-faculty contact (5-item scale; $\alpha = 0.85$); (c) working on a research project with a faculty member (binary item); (d) discussing a personal problem or concern with a faculty member (binary item); (e) perceived faculty willingness to spend time outside of class to discuss issues of interest and importance to students (Likert-scale item); (f) perceived faculty interest in teaching and student development (5-item scale; $\alpha = 0.85$); (g) frequency of discussions with faculty whose political, social, or religious opinions were different from their own (Likert-scale item); (h) how often faculty engaged students in cooperative learning activities (4-item scale; $\alpha = 0.70$); (i) whether courses helped the student see connections between intended career and how it affects society (Likert-scale item); and (j) whether courses helped the student understand the historical, political, and social connections of past events (Likert-scale item).

Control Variables

The longitudinal design of the WNS allowed the researchers to statistically control for a host of background, precollege, and collegiate characteristics that had the potential to confound the relationships of interest. Background characteristics included students' sex (male or female), race/ethnicity (Asian/Asian American/Pacific Islander, Black/African American, Latinx/Hispanic, or White/Caucasian), parental education (at least one parent earned a 4-year degree or higher vs. neither parent earned a 4-year degree), precollege academic achievement (students' ACT or equivalent exam score; standardized), precollege academic motivation (8-item scale; $\alpha = 0.74$; standardized), precollege political views (liberal/far left vs. middle-of-the-road/conservative/far right), and degree of involvement in high school activities (7-item scale; $\alpha = 0.58$; standardized). College/university institutional characteristics included institutional type (liberal arts college, regional college/university, or research university), institutional selectivity (Barron's selectivity measure ranging from nonselective to highly selective; standardized), and institutional size (total undergraduate student population; standardized).

Other college experiences controlled for included students' average grades during college (standardized), college major (STEM major, professional major, or arts/humanities/social science major), average hours spent engaged in employment on- or off-campus (standardized), average hours spent engaged in cocurricular activities (standardized), average hours spent preparing for class (standardized), the number of diversity courses taken during college (3-item scale; $\alpha = 0.68$; standardized), the frequency of attendance at diversity programs and workshops during college (6-item scale; $\alpha = 0.65$; standardized), and the degree of students' positive interactions with diverse peers (3-item scale; $\alpha = 0.82$; standardized). Finally, the longitudinal design of the WNS also allowed the researchers to control for a precollege measure of each dependent variable taken at the beginning of the first year of college, isolating changes in students' diversity attitudes to the four years of college examined.

Analyses

Analyses were performed in four stages using ordinary least-squares (OLS) regression in STATA. In the first stage of analysis, the researchers created a scaled measure of all 10 measures of students' perceptions of faculty practices and student-faculty interactions ($\alpha = 0.77$; standardized) and examined the association between this scale and both measures of students' diversity attitudes. In the second stage of analysis, the researchers considered whether the relationships between the scaled measure of students' perceptions of faculty practices and student-faculty interactions and both measures of students' diversity attitudes were moderated by students' race/ethnicity. In the third stage of analysis, the researchers examined the association between each of the individual 10 measures of students' perceptions of faculty practices and student-faculty interactions and both measures of students' diversity attitudes. In the final stage of analysis, the researchers calculated a change score measuring each student's change from pre-test to post-test for each outcome measure, creating two new dependent variables reflecting a change score for each outcome measure. The researchers then examined the association between each of the individual 10 measures of students' perceptions of faculty practices and student-faculty interactions and both change score measures of students' diversity attitudes.

All continuous variables were standardized prior to analyses to ease in the interpretation of results. Continuous variable regression coefficients are discussed in terms of standardized effect sizes, and range in size from small effects (0.02–0.07), to medium effects (0.08–0.14), to large effects (0.15–0.45), according to recommendations made by Mayhew et al. (2016) about standardized effect sizes in college impact research when a robust multivariate model is utilized. Dummy variables for WNS cohort membership were included in all models to control for potential cohort differences. The researchers also accounted for the nested nature of the WNS data (i.e., students in the sample were nested within institutions) by using a clustering command (SVY in STATA) to account for potential correlation between standard errors. Models were examined for potential multicollinearity issues, and variance inflation factors (VIFs) ranged from 1.07 to 2.20, below recommended VIF limits.

Results

The first stage of analysis examined the relationship between a scaled measure of all 10 measures of students' perceptions of faculty practices and student-faculty interactions ($\alpha = 0.77$) and each diversity outcome measure. In the presence of control variables for student background characteristics, college/university institutional characteristics, student attitudes, and college experiences, the scaled measure of all 10 measures of students' perceptions of faculty practices and student-faculty interactions was positively associated, on average, with students' openness to diversity and challenge (B $= 0.32$, $p < 0.001$, $R^2 = 0.46$) and students' universal-diverse orientation (B $= 0.20$, $p < 0.001$, $R^2 = 0.47$). These findings suggested that, on average, students' perceptions of faculty practices and student-faculty interactions were positively associated with positive attitudes toward diversity. The second stage of analysis considered whether the relationships between the scaled measure of students' perceptions of faculty practices and student-faculty interactions and each diversity outcome measure were moderated by students' race/ethnicity. Results of these analyses did not detect any statistically significant differences by students' race/ethnicity. These findings suggest that the positive relationships between students' perceptions of faculty practices and student-faculty interactions and students' diversity attitudes are similar for students, regardless of the student's race/ethnicity.

The third stage of analysis examined the relationship between each of the 10 individual, disaggregated measures of perceptions of faculty practices and student-faculty interactions and each diversity outcome measure (see Table 2). In the presence of control variables for student background characteristics, college/university institutional characteristics, student attitudes, and college experiences, several individual measures of perceptions of faculty practices and student-faculty interactions were positively associated with students' openness to diversity and challenge. These included: perceived faculty interest in teaching and student development (B $= 0.05$; $p < 0.05$); how often the student had discussions with faculty whose political, social, or religious opinions were different from their own (B $= 0.09$; $p < 0.001$); how often faculty engaged students in cooperative learning activities (B $= 0.06$; $p < 0.001$); whether courses helped the student see connections between intended career and how it affects society (B $= 0.04$; $p < 0.05$); and whether courses helped the student understand the historical, political, and social connections of past events (B $= 0.14$; $p < 0.001$). Similarly, in the presence of control variables, several measures of perceptions of faculty practices and student-faculty interactions were positively associated with students' universal-diverse orientation, including quality of faculty contact (B $= 0.06$; $p < 0.05$); how often

Table 2 Regression estimates for the relationship between faculty practices and interactions with students and two measures of students' diversity attitudes ($n = 3976$)

	Model I ODC	Model II UDO
	Coef. (S.E.)	Coef. (S.E.)
Background characteristics		
Sex: Male	−0.10 (0.03)***	−0.17 (0.03)***
Race/ethnicity: Asian/Pacific Islander	0.14 (0.04) ***	0.13 (0.05) **
Race/ethnicity: Black/African American	0.02 (0.06)	0.06 (0.09)
Race/ethnicity: Hispanic/Latino/a	−0.02 (0.06)	0.03 (0.06)
Parent education: 4-year degree or higher	−0.06 (0.03)	0.01 (0.03)
Precollege characteristics and attitudes		
Precollege academic ability	0.00 (0.02)	0.04 (0.02)*
Precollege academic motivation	−0.05 (0.02)**	−0.03 (0.01)*
High school involvement	−0.02 (0.01)	0.00 (0.02)
Precollege political views	−0.03 (0.01)*	−0.02 (0.01)
Precollege openness to diversity and challenge	0.30 (0.02)***	
Precollege universal-diverse orientation		0.45 (0.02)***
Institutional characteristics		
Institutional type: regional university	−0.01 (0.04)	0.06 (0.05)
Institutional type: research university	−0.09 (0.04)*	−0.02 (0.04)
Barron's institutional selectivity score	−0.04 (0.02)	−0.06 (0.02)**
Institutional size	0.04 (0.02)*	0.00 (0.01)
Other college experiences		
Arts, humanities, or social science major	0.01 (0.04)	0.01 (0.03)
Professional major	−0.01 (0.04)	0.01 (0.03)
Average college grades	0.03 (0.02)	0.04 (0.01)**
Academic effort and engagement	−0.01 (0.01)	0.02 (0.01)
Hours of paid employment	0.00 (0.01)	−0.02 (0.01)*
Hours of cocurricular involvement	−0.01 (0.01)	−0.04 (0.01)**
Number of diversity courses taken in college	0.08 (0.02) ***	0.04 (0.01) *

Table 2 (continued)

	Model I ODC Coef. (S.E.)	Model II UDO Coef. (S.E.)
Participation in diversity workshops and programs	0.15 (0.02) ***	0.16 (0.02) ***
Positive diversity interactions scale	0.20 (0.02) ***	0.14 (0.01) ***
Students' perceptions of faculty practices and student-faculty interactions		
Frequency of student-faculty contact	−0.02 (0.01)	−0.02 (0.02)
Quality of student-faculty contact	0.01 (0.02)	0.06 (0.02) *
Worked on a research project with a faculty member	0.01 (0.03)	0.00 (0.02)
Discussed a personal problem/concern with a faculty member	−0.02 (0.03)	0.00 (0.02)
Faculty willingness to spend time outside of class	0.02 (0.02)	−0.02 (0.02)
Faculty interest in teaching and student development	0.05 (0.02) *	0.02 (0.02)
Frequency of discussions with faculty whose political, social, or religious opinions were different from their own	0.09 (0.02) ***	0.03 (0.02)
Faculty engaged students in cooperative learning activities	0.06 (0.02) ***	0.05 (0.01) ***
Courses have helped the student see connections between their intended career and how it affects society	0.04 (0.02) *	0.04 (0.01) ***
Courses have helped the student understand historical, political, and social connections of past events	0.14 (0.02) ***	0.06 (0.02) ***
R^2	0.47	0.47

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; All continuous variables are standardized; Model I: Openness to diversity and challenge (ODC), Model II: Universal-diverse orientation (Miville-Guzman Universality-Diversity Scale or UDO). Reference group for Male is Female; reference group for race/ethnicity is White/Caucasian; reference group for Parent Education is Less Than a 4-Year Degree; reference group for Intuitional Type is Liberal Arts College; reference group for Major is Arts, Humanities, or Social Sciences Major; reference group for Worked on a Research Project with a Faculty Member is Did Not Work on a Research Project with a Faculty Member; reference group for Discussed a Personal Problem/Concern with a Faculty Member is Did Not Discuss a Personal Problem/Concern with a Faculty Member

faculty engaged students in cooperative learning activities (B = 0.05; $p < 0.001$); whether courses helped the student see connections between intended career and how it affects society (B = 0.04; $p < 0.001$); and whether courses helped the student understand the historical, political, and social connections of past events (B = 0.06; $p < 0.001$).

The fourth stage of analysis examined the relationship between each of the 10 individual, disaggregated measures of perceptions of faculty practices and student-faculty interactions and change score measures of students' diversity attitudes (see Table 3). In the presence of control variables for student background characteristics, college/university institutional characteristics, student attitudes, and college experiences, several individual measures of perceptions of faculty practices and student-faculty interactions were positively associated with change score measures of students' openness to diversity and challenge. These included: perceived faculty interest in teaching and student development (B = 0.05; $p < 0.01$); how often the student had discussions with faculty whose political, social, or religious opinions were different from their own (B = 0.04; $p < 0.01$); how often faculty engaged students in cooperative learning activities (B = 0.04; $p < 0.01$); whether courses helped the student see connections between intended career and how it affects society (B = 0.03; $p < 0.01$); and whether courses helped the student understand the historical, political, and social connections of past events (B = 0.08; $p < 0.001$). Similarly, in the presence of control variables, several measures of perceptions of faculty practices and student-faculty interactions were positively associated with change score measures of students' universal-diverse orientation, including how often faculty engaged students in cooperative learning activities (B = 0.03; $p < 0.01$); whether courses helped the student see connections between intended career and how it affects society (B = 0.03; $p < 0.01$); and whether courses helped the student understand the historical, political, and social connections of past events (B = 0.04; $p < 0.01$). Findings from this analysis of change scores were similar to findings from stage three of our analysis but revealed slightly smaller standardized coefficients in the examination of these relationships.

Limitations

This study and its findings have several noteworthy limitations. First, the primary aim of the WNS was to examine the experiences and outcomes associated with a liberal arts education, and as such, liberal arts colleges were oversampled in the WNS. This limits the generalizability of the current study, as findings may not be representative of all college and university institutional types within the United States. Similarly, the WNS sampled first-time, full-time undergraduate students, and the student sample was largely female (61%), White/Caucasian (84%), and continuing-generation (76%). This student sample is not necessarily representative of all undergraduate students in the United States, further limiting the generalizability of this study and its findings. As this study was concerned with students' diversity attitudes and differences for students from different racial/ethnic groups, the sample used for this study is limited in its overall generalizability to more diverse institutional settings and diverse student samples.

Additionally, this study is limited by its use of an existing dataset, where measures and instruments were predetermined. There may be others measures of faculty practices and interactions with students or students' diversity attitudes that were not measured by the WNS. Additionally, student demographic characteristics were measured using categorical responses that are limited to binary or narrow categories. For example, gender was

measured in binary terms (male or female), race was measured in broad categories (Asian/Asian American, Black/African American, Latinx/Hispanic, and White), and major was measured in grouped disciplinary categories (Social Sciences, Humanities, STEM, Professional, etc.). These groupings are limited in their scope of capturing students' identity and demographic characteristics. Finally, while the WNS utilized a robust longitudinal research design, allowing the researchers to control for a number of potential confounding factors, we recognize that there are likely to be other variables that may influence the outcomes or relationships examined in the current study.

Discussion and Implications

Prior research has demonstrated the positive influence of faculty practices and student-faculty interactions on a host of college outcomes (for reviews see Kim & Sax, 2017; Mayhew et al., 2016). The results of the present study add to these prior findings, demonstrating a positive association between several measures of students' perceptions of faculty practices and student-faculty interactions and two measures of students' fourth-year diversity attitudes.

Recent scholarship has increasingly focused on the type and context of faculty practices and interactions with students (Trolian & Parker, 2017; Trolian et al., 2016) to take a more nuanced approach to examining the relationship between these practices and student outcomes. Findings from the current study support the need for additional research that examines the type and context of faculty practices and interactions with students, rather than focusing solely on practices or interactions as a whole. This is demonstrated by our results, which suggest that some perceptions of faculty practices and student-faculty interactions contributed to gains in students' positive diversity attitudes, while others had no significant effect. Whereas the scaled measure of students' perceptions of faculty practices and student-faculty interactions was positively associated with both students' openness to diversity and challenge (B = 0.32, $p < 0.001$) and students' universal-diverse orientation (B = 0.20, $p < 0.001$) overall, when this scale was disaggregated, we found that some, but not all, measures were contributing to these relationships. These findings suggest a need to more fully consider the type and context of students' experiences with faculty when examining their relationship to college outcomes.

Findings from the current study demonstrate ways that students' attitudes pertaining to diversity may be positively influenced during their collegiate careers. Symbolic politics theory helps to inform what we know about the acquisition and change of values during individuals' lifetimes (Sears, 1993; Sidanius et al., 2008). This framework highlights the importance of learning moments that impact individuals' values, attitudes, and beliefs about diversity, race, and ethnicity. Yet, there continues to exist ambiguity about the impact of faculty practices and interactions with students on students' post college outcomes, such as persisting diversity beliefs and attitudes, civic outcomes, and political ideologies.

Students' classroom experiences with faculty have been positively associated with academic outcomes in prior research (Dwyer, 2015; Lundquist et al., 2002; Shepherd & Sheu, 2014). Findings of this study further demonstrate the importance of students' classroom experiences with faculty, where some interactions with and perceptions of faculty (quality of interactions, perceived faculty interest in teaching and student development, and how often the student had discussions with faculty whose political, social, or religious opinions were different from their own), and some faculty classroom and teaching

practices (cooperative learning activities, whether courses helped the student see connections between intended career and how it affects society, and whether courses helped the student understand the historical, political, and social connections of past events) were positively associated with students' fourth-year diversity attitudes. Additionally, measures in this study that characterized social and political contexts (e.g., frequency of discussions with faculty whose political, social, or religious opinions were different from their own) were positively associated with students' diversity attitudes. These findings suggest the important role that faculty interactions and teaching practices may play in shaping not only students' academic outcomes, but also influencing students' affective and developmental outcomes.

While further inquiry is needed to examine the nuanced differences between the different types experiences that students have with college and university faculty, seemingly, it is the substantive nature of these interactions that is important. The type or depth of investment that a faculty member has with a student may be the vital element of these interactions. That is, social connections between faculty and students through intentional engagement by faculty members may be impactful regarding student outcomes. The contribution of this study's findings to the literature provides empirical evidence and support for these relationships, given limited prior research in this scholarly domain. Based on this theme, one might question how to promote active and intentional faculty engagement in students' realized social and cultural outcomes? A similar question is how might this differ by major or academic program? That is, what are the salient ways that an engineering faculty member may impact students' diversity attitudes when compared to a faculty member in the humanities? While the substantive content of the courses may differ, higher education professionals should further consider how to help, regardless of academic program, foster constructive and meaningful interactions with students that help to promote positive diversity attitudes.

There has also been support in the higher education literature for diversity courses in college and how completion of diversity coursework may influence college outcomes, and in particular, students' attitudes about diversity. For instance, Parker et al. (2016) asserted that students display positive gains on measures of moral development when considering diversity coursework, and Bowman and Brandenberger (2012) found that diversity coursework was associated with more positive student attitudes toward diversity and social responsibility. The current study reveals that faculty teaching and curricula that focus on connections to societal issues or problems (e.g., courses that have helped students see connections between their intended career and how it affects society, and courses that have helped the students understand historical, political, and social connections of past events) may help to foster students' positive attitudes toward diversity.

The findings of this study are timely and of particular importance to higher education professionals. As colleges and universities continue to increase their structural, or compositional diversity, faculty and staff should consider college experiences that may influence students' awareness of diversity and foster students' positive diversity attitudes. Attending to faculty practices and student-faculty interactions appears to be one method for institutions to promote positive attitudes toward diversity and help prepare the next generation of students to be more globally minded and open to diversity.

Findings from this study also illuminate implications for policy and practice in higher education. Higher education professionals should consider ways to facilitate thoughtful and engaging dialogues between faculty and students that promote effectual student diversity outcomes. Specifically, higher education professionals may want to consider ways to create and implement institutional programs that foster student-faculty interactions that promote

Table 3 Regression estimates for the relationship between faculty practices and interactions with students and two measures of students' diversity attitudes, using change scores measuring each student's change from pre-test to post-test ($n = 3976$)

	Model I ODC	Model II UDO
	Coef. (S.E.)	Coef. (S.E.)
Students' perceptions of faculty practices and student-faculty interactions		
Frequency of student-faculty contact	−0.01 (0.02)	−0.02 (0.02)
Quality of student-faculty contact	0.02 (0.01)	0.02 (0.02)
Worked on a research project with a faculty member	0.01 (0.02)	0.02 (0.02)
Discussed a personal problem/concern with a faculty member	−0.02 (0.02)	−0.02 (0.02)
Faculty willingness to spend time outside of class	0.00 (0.02)	−0.02 (0.02)
Faculty interest in teaching and student development	0.05 (0.02)**	0.02 (0.02)
Frequency of discussions with faculty whose political, social, or religious opinions were different from their own	0.04 (0.01)**	0.02 (0.01)
Faculty engaged students in cooperative learning activities	0.04 (0.02)**	0.03 (0.01)**
Courses have helped the student see connections between their intended career and how it affects society	0.03 (0.01)**	0.03 (0.01)**
Courses have helped the student understand historical, political, and social connections of past events	0.08 (0.01)***	0.04 (0.01)**
R^2	0.20	0.10

$***p < 0.001$, $**p < 0.01$, $*p < 0.05$; All continuous variables are standardized; Model I: Openness to diversity and challenge (ODC), Model II: Universal-diverse orientation (Miville-Guzman Universality-Diversity Scale or UDO). Reference group for Worked on a Research Project with a Faculty Member is Did Not Work on a Research Project with a Faculty Member; reference group for Discussed a Personal Problem/Concern with a Faculty Member is Did Not Discuss a Personal Problem/Concern with a Faculty Member; All control variables were included in both models

intercultural sensitivity among students. Effective programming that goes beyond customary workshops or meetings (e.g., standard office hours) are vital for engaging students in interaction and experiences with faculty that can promote learning. For example, student affairs professionals might facilitate these difficult dialogues between faculty and students that promote student learning about diversity and difference.

The role of faculty in promoting positive diversity attitudes among students requires additional research, however, the authors argue that faculty should have a distinct role in fostering positive and constructive diversity attitudes inside and outside of the classroom. Faculty should first engage in self-reflection of their own diversity attitudes and how those attitudes are reflected in their classroom approaches and interactions with students. This could be achieved by participating in culturally-minded teaching and pedagogical development experiences. Further, faculty might also consider partnerships with student affairs professionals to foster opportunities to engage with students outside the classroom.

Directions for Future Research and Conclusions

The findings of this study also suggest several promising directions for future research. First, it is important for researchers to further examine the relationship between student-faculty interactions and faculty teaching practices and students' diversity attitudes. Researchers should consider innovative research designs that empirically investigate the impact of these collegiate experiences on diversity outcomes. These research designs might represent varying and comprehensive student and institutional samples or studies that examine nuanced conceptions of student-faculty interactions. Furthermore, one might question the degree to which student-faculty interactions are impactful in students. Is time a moderator? That is, does having more classes with faculty members promote a more significant change (or swing in attitudes) or is it simply the quality of the interactions. These are further explorations that might inform the higher education community about students' experiences with faculty.

Second, students at varying institutional types might have differing experiences related to their interactions with faculty and their resulting diversity attitudes. Ostensibly, this claim might be more pronounced at special serving institutions, such as minority-serving colleges and universities. Accordingly, the social and demographic identity of the faculty member may also be a salient factor. There might exist differential influences of students' diversity attitudes that correlate with faculty members' own diversity experiences. Thus, researchers should examine these student encounters based on the background and experiences of the students' faculty. Similarly, additional research should focus on the quality of students' interactions with faculty. Particularly, how do positive (or negative) interactions influence students' diversity attitudes?

Finally, researchers may also want to employ more nuanced methodological approaches to examine the association between students' experiences with their faculty and their diversity attitudes. For instance, qualitative research designs may provide rich and robust findings through the lens of current students that might reveal the nature of how those interactions impact their attitudes. Further, analyzing their students' narratives about their experiences with faculty may help to inform our understanding of quality of those experiences.

In sum, findings from this study suggest that some faculty teaching practices and student-faculty interactions are positively associated with students' fourth-year diversity

attitudes and changes in diversity attitudes during college. Faculty have an important role to play both inside and outside of the classroom in supporting student outcomes, and this study's findings suggest several faculty practices and interactions that may be helpful in supporting students' development of positive attitudes toward diversity in college. While these findings support a growing body of literature on student-faculty engagement and diversity outcomes in higher education, additional research is needed to further explicate the moderating effects of race on college student outcomes, particularly psychosocial outcomes embodying students' diversity related perceptions.

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