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Andrew J. Ryder, Robert D. Reason, Joshua J. Mitchell, Kathleen Gillon, and Kevin M. Hemer

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Climate for Learning and Students' Openness to Diversity and Challenge: A Critical Role for Faculty

Andrew J. Ryder
University of North Carolina Wilmington

Robert D. Reason, Joshua J. Mitchell,
Kathleen Gillon, and Kevin M. Hemer
Iowa State University

Utilizing data from 15 institutions that participated in the 2013 and 2014 administrations of the Personal and Social Responsibility Inventory (PSRI), this study employed a multilevel modeling approach to examine the relationship of students' perceptions of their climate for learning to their scores on the Openness to Diversity and Challenge Scale (ODC). Guided by Bronfenbrenner's process-person-context-time (PPCT) model of student environments, we found that a climate for learning perceived as valuing a wide range of ideas and perspectives and including faculty advocacy for the respect of diverse ideas and points of view is positively related to students' openness to diversity and challenge.

Keywords: climate for learning, openness to diversity and challenge, Personal and Social Responsibility Inventory, multilevel modeling

For nearly 40 years, institutional leaders and scholars have challenged higher education to reinvigorate its civic mission (Boyer, 1987; Thomas & Levine, 2011) and to prepare students for active citizenship in a diverse society (Dey & Associates, 2010; Gutmann, 1987; Hamrick, 1998; Hurtado, 2007). Although diversity remains unevenly distributed across individual institutions of higher education (Colby, Ehrlich, Beaumont, & Stephens, 2003), a pluralistic society awaits most college graduates. Non-Hispanic Whites comprise less than two thirds of the U.S. population (U.S. Census Bureau, 2011) and demographic models predict that no single racial or ethnic group will constitute a majority of the total population by mid-century (U.S. Census Bureau, 2012). Our diverse identities frequently intersect with social, economic, and political issues revealing myriad values and points of view (Colby, Beaumont, Ehrlich, & Corngold, 2007).

Developing openness to this breadth of diversity and willingness to engage with diverse perspectives (Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1996; Whitt, Edison, Pascarella, Terenzini, & Nora, 2001) is among the most important civic outcomes of college if higher education is to successfully prepare students for active citizenship in our society. Faculty members have long been considered primary socializing agents in higher education (Endo & Harpel, 1982; Pascarella & Terenzini, 2005) as they set and deliver the curriculum, advance knowledge through research and scholarship, and engage the campus and community through service. Through this intellectual leadership, faculty members influence student learning and development, including students' openness to diversity and challenge (Pascarella et al., 1996; Pascarella & Terenzini, 2005; Reason, Cox, McIntosh, & Terenzini, 2010; Whitt et al., 2001). We suggest that faculty members influence this important outcome not only by what and how they teach, but through the climate for learning they create in their classrooms and across campus, and how students perceive this

Andrew J. Ryder, Department of Educational Leadership, Watson College of Education, University of North Carolina Wilmington; Robert D. Reason, School of Education, Higher Education Program, Iowa State University; Joshua J. Mitchell, School of Education, Research Institute for Studies in Education, Iowa State University; Kathleen Gillon, Iowa State University; Kevin M. Hemer, School of Education, Higher Education Program, Iowa State University.

Correspondence concerning this article should be addressed to Andrew J. Ryder, Department of Educational Leadership, Watson College of Education, University of North Carolina Wilmington, 601 South College Road, Wilmington, NC 28403. E-mail: rydera@uncw.edu

climate. Unfortunately, the relationship between the climate for learning and this important outcome is not well understood. The purpose of our study, therefore, is to explore the relationship between students' perceptions of the climate for learning and their openness to diversity and challenge.

To do so, we used a modified version of the ODC scale created by Pascarella and colleagues (1996) for the National Survey of Student Learning as our outcome measure. Controlling for a series of demographic variables, we examined the influence of the climate for learning operationalized by perceptions of the climate as supportive of exploration of diversity and diverse perspectives and encouraging of respect for diverse people and ideas. We also included variables related to students' exposure to high impact practices (Kuh, 2008).

Literature Review

Three strands of literature provide the foundation for our study. In this section, we explain the types of diversity featured in studies of higher education and their demonstrated effects on student learning, highlighting the importance of curricular diversity. Next, we review literature related to our outcome variable, the ODC scale (Pascarella et al., 1996; Whitt et al., 2001). Finally, we discuss the important role of faculty members in creating a climate for learning that supports students' development of ODC.

Diversity in Higher Education and Associated Outcomes

Three types of diversity have been identified in higher education: structural diversity, interactions with diverse others, and curricular or classroom diversity (Gurin, Dey, Hurtado, & Gurin, 2002; Hurtado, Milem, Clayton-Petersen, & Allen, 1999). Studies of diversity and related educational outcomes within higher education typically focus on one or a combination of these three categories. Each category of diversity has been linked to outcomes related to overall student learning (Bowman, 2010; Gurin et al., 2002; Nelson Laird, 2005), commitment to tolerance and understanding of difference (Antonio, 2001; Chang, 2002; Denson, 2009; Zuniga, Williams, & Berger, 2005), and democratic outcomes of college, which include the

ability to work in and contribute to a diverse community (Engberg, 2007; Gurin et al., 2002; Jayakumar, 2008).

Structural diversity is defined as the presence of diversity on campus as indicated by student demographic data (Hurtado et al., 1999). Structural diversity also includes socioeconomic strata that may be less apparent among demographic data, but brings students together across class lines (Park, Denson, & Bowman, 2013). Studies of structural diversity focus on the benefits of the presence of diversity on college campuses; without structural diversity, interactions with diverse others—the second category of diversity in higher education scholarship—become difficult to achieve (Gurin, 1999; Gurin et al., 2002; Reason, Cox, Quaye, & Terenzini, 2010). Structural diversity often leads to interactional diversity that can result in increases in students' self-reported growth in acceptance of people of different races and cultures, tolerance of different beliefs, overall leadership abilities, and long-term cultural competencies for majority students working and living in integrated communities (Chang, Denson, Sáenz, & Misa, 2006; Hurtado, 2001; Jayakumar, 2008).

Interactions with diverse others include both formal and informal associations (e.g., as part of friendship groups, on residence hall floors, in the classroom). Positive interactions with diverse peers, in both social and intellectually related settings (e.g., studying, discussing issues of race), were demonstrated to contribute to the sense of belonging on campus for both students of color and White students (Locks, Hurtado, Bowman, & Oseguera, 2008). Interactions with diverse others have been demonstrated to positively affect students' gains in cultural awareness and commitment to racial understanding (Antonio, 2001), challenge their own prejudice, advocate more for inclusion and social justice (Zuniga et al., 2005), and contribute to increased levels of self-reported academic self-confidence, social agency, and critical thinking (Nelson Laird, 2005). Bowman's (2010) meta-analysis of 17 diversity studies showed students' interactions with diverse peers were related to increased cognitive growth. Sustained cross-racial interactions, such as diverse friendships or friendship groups, demonstrated the greatest significant cognitive benefits and openness to diversity (Bowman, 2012; Chang et al., 2006).

Curricular diversity—formal opportunities to expose students to different people, perspectives, and ideas—was the third type of diversity (Denson, 2009; Hurtado et al., 1999). Denson's definition of curricular diversity as "intentionally structured and purposeful programmatic efforts to help students engage in diversity in the form of both ideas and people" (p. 806) includes service learning, required diversity courses, and other pedagogical practices that introduce diverse perspectives and explore controversial issues.

Curricular diversity prepares students for the diverse people and ideas that comprise the U.S. democracy and the global community by reducing prejudice and increasing intergroup racial understanding (Antony, 1993; Chang, 2002). Specifically, participation in required or optional diversity-related courses motivated students to advocate for inclusion and social justice (Zuniga et al., 2005), increased students' pluralistic orientation through the exploration of diverse identity groups (Engberg, 2007), and enhanced their academic self-confidence, critical thinking, and sense of social agency (Nelson Laird, 2005). Bowman's (2009) study using data from the Wabash National Study of Liberal Arts Education collected at the beginning and end of students' first year of college indicated that completing a single diversity-related course increased students' interest in understanding diversity issues; additional diversity-related courses did not improve upon these results. Based on their experience with curricular diversity at one large research institution, White students affirmed difference as compatible with democracy and democratic ideals (Gurin et al., 2002).

Openness to Diversity and Challenge

The ODC scale was created by Pascarella and colleagues (1996) for the National Survey of Student Learning. The scale included eight items concerned with students' openness to diverse cultures, races, ethnicities, and values as well as individuals' willingness and enjoyment of having their ideas challenged by different values and perspectives (Pascarella et al., 1996; Whitt et al., 2001). Enrollment in diversity-related courses, discussing controversial topics that challenged students' perspectives, interactions with diverse peers, a positive campus climate for diversity, and living on campus were all associated with students' increased ODC at the end of the first year of college (Pascarella et al., 1996).

A subsequent longitudinal study tracked students' reported ODC from the start of their second year to the end of their third year of college (Whitt et al., 2001). The study identified a perception of a nondiscriminatory campus climate, institutional emphasis on critical and analytical thinking, living on campus, participation in racial/cultural awareness workshops, and participating in conversations emphasizing different perspectives and ways of thinking as key factors for positive change between the beginning and end of the second year. Factors predicting increased ODC from the end of the second year to the end of the third year were students' perception of a nondiscriminatory campus climate, completion of courses in the arts and humanities, increased interactions with faculty, participation in racial/cultural awareness workshops, and participating in peer conversations emphasizing different perspectives and ways of thinking. Overall, women and older students reported higher levels of ODC, while a nondiscriminatory campus climate resulted in greater gains in ODC for non-White than White students.

Faculty Practices and the Climate for Learning

As demonstrated above, there is substantial research on specific teaching and pedagogical practices that promote ODC and other diversity-related learning outcomes. The many positive effects of curricular diversity have been almost fully explained by students' engagement with diverse people and differing points of view in academic settings (Denson, 2009; Engberg, 2007; Sáenz, Ngai, & Hurtado, 2007); intergroup interactions that were sustained over time were found to be especially beneficial (Bowman, 2012; Chang et al., 2006). Many of the most effective strategies related to increasing students' ODC identified in the research can be characterized as cooperative learning strategies (Cabrera et al., 2002) aligned with "high impact educational practices" (Kuh, 2008, p. 1). These strategies include collaborative and discussion-based learning, community service and service-learning, reflection, and diversity courses. Sim-

ilarly, active teaching and assessment practices, such as student presentations and in-class discussions, as well as community service activities, were found to be more likely to encourage student encounters with difference (Reason, Cox, McIntosh, et al., 2010).

Faculty members almost exclusively determine whether and how to pursue these sorts of educational practices, given their primary responsibility for institutional academic policies, curricula, and what occurs in classrooms. When faculty members engage students over intellectual topics and disciplinary values, provide formal feedback on academic work, and interact informally with students, faculty members communicate preferred behaviors and dispositions (Bragg, 1976) and hold considerable sway over students' intellectual and personal development (Pascarella & Terenzini, 2005). Such influence has established faculty members as the primary socializing agents for student learning and development (Endo & Harpel, 1982; Pascarella & Terenzini, 2005; Reason, Cox, Quaye, et al., 2010).

Interest in campus climates originated in the 1980s as an outgrowth of research in organizational behavior (Peterson & Spencer, 1990). Today, race and other aspects of diversity are featured most prominently in the campus climate literature (Hurtado, Griffin, Arellano, & Cuellar, 2008; Victorino, Nylund-Gibson, & Conley, 2013), but the breadth of studies has included personal and social responsibility (O'Neill, 2012; Ryder & Mitchell, 2013), spirituality (Rockenbach & Mayhew, 2014), learning (e.g., Treagust & Fraser, 1986), and other climate-related topics. A number of contextual and behavioral factors both on- and off-campus impinge on the overall campus climate (e.g., legislative and institutional policies, campus environments, group and individual behaviors), confounding efforts at direct measurement (Hurtado et al., 2008; Rankin & Reason, 2008). Consequently, educational researchers have designed a number of valid, reliable surveys to understand campus climates by examining individuals' perceptions, attitudes, and experiences of the climate (Hart & Fellabaum, 2008).

Faculty members' broad range of academic and socializing responsibilities invests them with unrivalled influence in determining the campus climate for learning (Reason, 2013). In setting academic policies, structuring the curriculum, and deciding what to teach and how to design opportunities for learning faculty members operate in increasingly closer proximity to student learning (Bronfenbrenner, 2005; Longerbeam, 2010). We contend that the campus climate for learning plays a critical role in the development of ODC. Specifically, when faculty foster a climate for learning that students perceive as valuing the exploration of diversity and diverse perspectives and advocating for the respect of people and issues of difference, the climate for learning will be positively related to students' ODC.

Theoretical Framework

The current study draws upon ecological theories of student learning and development that suggest learning must be understood within students' environments (Bronfenbrenner, 1979, 1993, 2005; Renn & Arnold, 2003). The most recent version of Bronfenbrenner's theory (2005), referred to as the PPCT model, considered four components integral to development: process, person, context, and time. For the current study, this model assisted us in exploring how the climate for learning within the undergraduate college experience promotes developmental outcomes, specifically openness to diversity and challenge.

Process can be defined as the interaction between a person and their environment, understanding that each can influence the other. Bronfenbrenner's model focuses on proximal processes or interactions that are closest to individual students' experiences. Renn and Arnold (2003) expanded on this model suggesting that these processes should be of increasing complexity. In this study, we were specifically interested in the influence of the perceived climate for learning, as shaped by faculty members and the value they placed on exploration of diversity and advocacy for respective diverse peoples and ideas. The climate for learning exists in close proximity to students' intellectual endeavors and such closeness contributes to increasingly complex outcomes, such as openness to diversity and challenge (Bronfenbrenner, 2005; Longerbeam, 2010).

In theorizing the role of the person within environment, Bronfenbrenner (1979, 1993, 2005) focused on the role of demographics and abilities and how these factors influence stu-

dents' engagement with their environments. Bronfenbrenner posited that how a person engages with their environment is informed by specific attributes, which he referred to as developmentally instigative characteristics. Renn and Arnold (2003) applied these characteristics to college students, illustrating how their characteristics can inform decisions and actions resulting in a variety of developmental outcomes. For this specific study, we considered students' race, gender, and class year as well as two developmentally instigative characteristics—living on campus and participation in Greek life—which allowed us to consider how students engage in complex activities such as those related to development of openness to diversity and challenge.

In Bronfenbrenner's (1979, 1993, 2005) ecological theory, context is intricately linked to process and is defined as the place in which development occurs. Renn and Arnold (2003) built upon Bronfenbrenner's (1993) assumption that development takes place primarily in immediate, face-to-face contexts, arguing that researchers should incorporate student subcultures into studies of student learning. According to Renn and Arnold, these subcultures, or what Bronfenbrenner referred to as *microsystems*, would include various environments in which students exists, such as close peer groups, roommate and residence hall floor relationships, and, in the case of this study, classrooms and other learning environments.

Finally, within Bronfenbrenner's model, process, person, and context must be considered within a framework of time. Often, time in relation to human development is studied longitudinally from one specific point to another, such as from the beginning of a student's college career to the end. However, Bronfenbrenner's ecological theory allows for the consideration of time as specific snapshots in an individual's life span. In the case of this study, time is qualified as the point in time in which students are engaged in the undergraduate college experience.

Research Method

To further understand the influence of the climate for learning on students' development of openness to diversity and challenge, we used student-level data collected from 15 higher education institutions that administered the PSRI in 2013 or 2014. Selection of predictor variables was guided by our theoretical framework (Bronfenbrenner, 2005) and reviewed literature. We used multilevel modeling techniques to account for the nested nature of our data—students nested within institutions.

Data Sources

Data for this study came from 15 institutions in the 2013 and 2014 administrations of the PSRI that included the ODC scale, an optional outcome scale. The PSRI arose from the Core Commitments Initiative of the Association of American Colleges and Universities. The instrument assesses students' behaviors and perceptions of institutional climate along five dimensions: striving for excellence, cultivating academic integrity, contributing to a larger community, taking seriously the perspectives of others, and developing competence in ethical and moral reasoning and action (Dey & Associates, 2010). Prior to any analysis, and in keeping with good survey data methods (Cox, McIntosh, Reason, & Terenzini, 2014), missing data were imputed using expectation-maximization to account for item nonresponse and weighted by sex, class year, and race to account for survey nonresponse. The final dataset included a weighted sample of 11,216 students from 15 institutions. The sample is mostly female ($n = 7,329$, 65.3%) and White ($n = 6,354$, 56.7%); the largest categories of non-White respondents were Asian ($n = 1,574$, 14.0%), Hispanic of any race ($n = 1465$, 13.1%), two or more races ($n = 977$, 8.7%) and Black or African American ($n = 554$, 4.9%). By class year, seniors comprised the largest proportion of the sample ($n = 3,945$, 35.2%) with juniors, sophomores, and first year students representing successively smaller percentages. Table 1 summarizes the demographic characteristics of our sample.

Criterion Variable: ODC

For our current study the criterion variable was a modified version of the eight-item ODC scale (Pascarella et al., 1996). Our version of the scale included seven items previously used by Reason, Cox, McIntosh, et al. (2010) following a confirmatory factor analysis that suggested one item should be removed. ODC is believed to assess "a student's openness to cul-

Table 1
Demographic Characteristics

	n	*%*		*n*	*%*
Sex			Race		
Male	3,755	33.5	White	6,354	56.7
Female	7,329	65.3	Hispanic of any race	1,465	13.1
Transgender/gender					
nonconforming	87	.8	Asian	1,574	14.0
Missing	45	.4	Black or African American	554	4.9
Total	11,216	100.0	Native Hawaiian or other Pacific Islander	66	.6
Class year			American Indian or Alaska Native	48	.4
First year	1,907	17.0	Two or more races	977	8.7
Sophomore	2,042	18.2	Nonresident (international)	146	1.3
Junior	3,285	29.3	Missing	32	.3
Senior	3,945	35.2	Total	11,216	100.0
Missing	37	.3			
Total	11,216	100.0			

Note. Data were imputed and weighted during analysis to account for item and survey nonresponse.

tural, racial, and value diversity . . . as well as the extent to which a student enjoys being challenged by different perspectives, values, and ideas" (Whitt et al., 2001, p. 178). The ODC scale used in this study had a Cronbach's alpha of .954 as determined by a separate confirmatory factor analysis. Factor loadings for the seven scale items in this study are provided in Table 2.

Predictor Variables of Primary Interest

Based on the literature reviewed, the predictor variables of primary interest were related to students' perceptions of the climate for learning created by classroom environments. These variables are drawn specifically from the dimension of the PSRI that measures perceived institutional climate for taking seriously the perspectives of others. We included variables related to students' participation in required diversity courses and service learning activities required as part of a class (Pascarella et al., 1996; Whitt et al., 2001), as well as other high impact educational practices (Kuh, 2008). We also included students' perceptions of the importance their coursework and faculty members placed on engaging with difference (Reason, Cox, Quaye, et al., 2010). We controlled for the institution the student attended as well as students' sex, race, and year in school (Pike, 2000). Table 3 provides a full explanation of each of these predictor and control variables.

Analytical Methods

The nested nature of our data—students within institutions—suggested that a multilevel

Table 2
Factor Loadings for the Openness to Diversity and Challenge Scale

Item	Factor loading
I enjoy having discussions with people whose ideas and values are different from my own.	.856
The real value of a college education lies in being introduced to different values.	.868
I enjoy talking with people who have values different from mine because it helps me understand myself and my values better.	.859
Learning about people from different cultures is a very important part of my college education.	.916
I enjoy taking courses that challenge my beliefs and values.	.907
The courses I enjoy the most are those that make me think about things from a different perspective.	.889
Contact with individuals whose background (e.g., race, national origin, sexual orientation) is different from my own is an essential part of my college education.	.777

α = .954.

Table 3
Description of Variables

Criterion variable
  Openness to Diversity and Challenge (ODC) is a 7-item scale. Students rated level of agreement (1 = *strongly disagree*, 2 = *disagree somewhat,* 3 = *neutral*, 4 = *agree somewhat*, 5 = *strongly agree*) to the following items:
    I enjoy having discussions with people whose ideas and values are different from my own.
    The real value of a college education lies in being introduced ot different values.
    I enjoy talking with people who have values different from mine because it helps me understand myself and my values better.
    Learning about people from different cultures is a very important part of my college education.
    I enjoy taking courses that challenge my beliefs and values.
    The courses I enjoy the most are those that make me think about things from a different perspective.
    Contacts with individuals whose background (e.g., race, national origin, sexual orientation) is different from my own is an essential part of my college education.
Control variables
  Class year: Students are asked to indicate their class year (1 = first year, 2 = second year, 3 = third year, 4 = senior).
  Sex: Students indicate the category with which they identify (0 = male, 1 = female).
  Race: Students are asked to "mark all that apply" to a list of possible racial identities. Because of sample sizes for this study, race was collapsed into a dichotomous variable (0 = White, 1 = non-White).
  Greek participation*:* Students indicate their level of engagement with fraternity and sorority activities. "In a typical week, how many hours do you spend on fraternity/sorority life activities. (0 = none through 7 = more than 30 hr/week).
  On-campus residence: Students report their current residence (0 = off-campus, 1 = on-campus).
High impact practices
  Students indicate their level of participation since entering college in a series of activities known to improve learning and development (0 = never, 1 = once, 2 = twice, 3 = three or more times). These high-impact practices include:
    "Core" courses in general education taken by all students
    Learning community
    Internship
    Original research with a faculty member
    Study abroad
    Capstone course/senior thesis/culminating project
    Community service as part of a course (i.e., service learning)
    Required diversity/global course/program
Climate for learning
  Students were asked to indicate either their level of agreement or engagement with the following climate for learning measures, drawn from the perspective-taking dimension of the PSRI. Both the agreement and engagement scales were 5-point Likert-type scales as indicated below.
    Classes help explore diverse perspectives, cultures, and world views (1 = *almost never*, 2 = *not very often*, 3 = *occasionally*, 4 = *often*, 5 = *almost always*)
    Classes encourage students to research ideas and explore controversial issues with various perspectives using evidence-based claims (1 = *almost never*, 2 = *not very often*, 3 = *occasionally*, 4 = *often*, 5 = *almost always*)
    Faculty at this institution teach about the importance of considering diverse intellectual viewpoints (1 = *strongly disagree*, 2 = *disagree somewhat*, 3 = *neutral*, 4 = *agree somewhat*, 5 = *strongly agree*)
    Faculty at this institution help students think through new and challenging ideas or perspectives (1 = *strongly disagree*, 2 = *disagree somewhat*, 3 = *neutral*, 4 = *agree somewhat*, 5 = *strongly agree*)
    Faculty members advocate the need for students to respect perspectives different from their own (1 = *almost never*, 2 = *not very often*, 3 = *occasionally*, 4 = *often*, 5 = *almost always*)

approach was appropriate (Raudenbush & Bryk, 2002). Multilevel modeling (MLM) permits comparison of the within-institution and between-institution effects, allowing unique estimations of the influence of the institutional-level variables and the influence of the individual-level variables on the criterion variable. Beginning with a fully unconditional model (i.e., one with no level one or level two predictors), we tested the assumption that at least some of the variance in the criterion variable was attributable to institutional differences.

Results of the unconditional model on these data indicated individual-level variables accounted for over 97% of the variance in the students' scores on the ODC scale. Although less than 3%, the variance associated with institutional-level variables was statistically significant ($p < .05$), which forced us to make a decision about how best to proceed analytically (Astin & Denson, 2009; Hox, 1998; Niehaus, Campbell, & Inkelas, 2014). Astin and Denson argued that MLM is not necessary, nor appropriate, in an instance when the Level 2 variance is so small; Niehaus and her colleagues offered a compelling argument for continuing with a multilevel approach.

Niehaus and colleagues (2014) addressed the costs and benefits to using a MLM approach with nested variables when only a small portion of the variance is attributable to the institutional-level variables. They assert that a multilevel approach is more parsimonious and limits concerns about making a Type I error. On the contrary, MLM increases the possibility of committing a Type II error and limits researchers' ability to use effect sizes as a measure of the substantive significance of any single predictor variable.

Based on our reading of the methodological literature (Astin & Denson, 2009; Niehaus et al., 2014), we chose to proceed with our analysis in what we believe to be a conservative fashion: we conducted MLM using only Level 1 predictor variables. The multilevel approach accounts for the nested nature of our variables and limits the possibility of committing a Type I error (Niehaus et al.), which we believed to be a more serious threat to our analysis than the possibility of Type II errors. By not including any Level 2 predictor variables, we avoid implying any substantive significance at the institutional level. Finally, in order to increase our own confidence in our decision to use MLM, we compared the results of our analysis with results from the same analysis using ordinary least squares regression. No substantive differences were found that would suggest we should have proceeded in a different manner.

As with all multilevel analyses, we began with the results of our fully unconditional model as a baseline understanding of how the variance was parsed between- and within-institutions. We entered groups of individual-level variables into three separate blocks in order to isolate the effects of the predictor variables in each block. Block 1 included demographic variables (sex, class year, and race [White/non-White]), student residence (on vs. off campus), and the amount of participation in Greek life activities. Block 2 included variables related to students' participation in specific curricular activities identified as high-impact educational practices (Kuh, 2008). The perceived climate for learning variables in block three included students' perceptions of coursework and faculty roles in teaching about and advocating for considering diverse cultures, intellectual viewpoints, and perspectives (Reason, Cox, Quaye, et al., 2010).

Limitations

Like all research studies, the study presented here has noteworthy limitations. First, the study is cross-sectional without a pretest measure of ODC and the relationships we have identified should not be interpreted as causal. The PSRI and the ODC ask students to report their perceptions of the campus climate and their openness to diversity. Although both instruments have been used widely and the ODC scale, in particular, has been validated through several previous studies, self-reported data warrants caution. Institutions self-selected to participate as part of an assessment initiative related to personal and social responsibility; similarly, student respondents chose to participate in the PSRI. Weighting procedures described above should mitigate self-selection bias at both the institutional- and individual level, but this cannot be assured.

Finally, and importantly, survey design necessitated collapsing students' racial identity variables into a dichotomous coding of "White/non-White." The PSRI allows students to choose among numerous racial and ethnic identities, including the option of selecting multiple identities. Any respondent who selected multiple identities, including respondents who selected White as one of their identities, were coded as non-White. Allowing such a range of identities assists institutions in the assessment process, but creates difficulty in interpreting our results since we are not able to capture fully the nuances of individual students' racial and ethnic identities. These are ongoing methodological and philosophical concerns for quantitative re-

searchers and highlights the importance of qualitative and mixed-methods approaches to further understand any findings from this and other large database studies.

Results

Model 1 included only demographic variables and accounted for less than 1% of the variance in ODC. All demographic variables were statistically significant in Model 1, although their individual and overall influence on ODC was trivial. Model 2, which introduced the high-impact educational practices, did not account for any additional variance, although two variables were statistically significant. Partici-

pating in a capstone course, a senior thesis, or a culminating project was statistically significantly negatively related to ODC. Participating in required diversity courses or programs, however, was significantly positively related to ODC (Table 4).

Model 3, which included all previous variables and introduced variables related to students' perceived climate for learning, accounted for about 7% more variance than the first two models. Interestingly, among the variables related to the climate for learning, the inclusion of students' perceptions about the emphasis on diversity in courses and by faculty members changed the relationships between several high

Table 4
Parameter Estimates

	Baseline model: Unconditional model	Model 1: Demographics	Model 2: High impact practice	Model 3: Students perceptions	Model 4: Parsimonious model
Intercept	3.950***	3.820***	3.802***	3.904***	3.975***
Class year		.026*	.028*	.036**	.032**
Sex		.081***	.075***	.025	
Race		−.116***	−.118***	−.105***	−.100***
Greek participation		−.030**	−.029**	−.023*	−.023*
On-campus residence		.108**	.103**	.084*	.084*
General education courses			.012	.017	
Learning community participation			−.021	−.040***	−.038***
Internships			.021	.029	
Original research			−.036	−.057**	−.063**
Study abroad			−.043	−.027	
Capstone course			−.056*	−.044	
Community service			.015	−.010	
Required diversity courses			.039*	.007	
Classes help explore diverse perspectives, cultures, and world views				.117***	.119***
Classes encourage students to research ideas and explore controversial issues using evidence				.134***	.132***
Faculty teach about the importance of considering diverse intellectual viewpoints				.002	
Faculty help students think through new and challenging ideas and perspectives				.066***	.070***
Faculty members advocate for students to respect diverse viewpoints				.047**	.049**
Sigma-square	1.549***	1.542***	1.540***	1.442***	1.443***
Tau	.047*	.052*	.047*	.052*	.053*
Interclass correlation	.029				
Level 1 variance explained (%)		.05	.05	6.92	6.90

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

impact practices and ODC. Specifically, participation in a capstone course, senior thesis or culminating project, and participation in diversity-related courses are no longer significantly related to ODC. Further, participation in a learning community and in original research, both of which were nonsignificant in the previous model, became significantly negatively related to ODC. These findings are indicative of some level of collinearity between the high impact practices and student's perceptions of the climate for learning and the emphasis on diversity. That is to say, students who perceived that the climate for learning encourages engagement with diverse others and ideas were also likely engaged in several high impact practices.

Students' perceptions of how much the climate for learning supported the exploration of diverse perspectives, cultures, and worldviews and encouraged research of controversial ideas were positively related to ODC. So too were students' perceptions of how the climate for learning valued thinking through new and challenging ideas and advocating for respect of diverse viewpoints.

The final step was to estimate a parsimonious model that contained only those variables previously identified as statistically significantly related to ODC. Ten variables significantly contributed to the overall model. No substantive differences emerged when the parsimonious model was compared to Model 3. As would be predicted by Bronfenbrenner (2005), the two items related to students' perceptions of the classroom climate for learning were most strongly related to ODC: "Classes encourage students to research ideas and explore controversial issues using evidence" and "Classes help explore diverse perspectives, cultures, and world views."

Discussion

This study examined the relationship between students' perceptions of the climate for learning, including participation in high impact educational practices, and openness to diversity and challenge. Our final model accounts for only 7% of the 97% of the individual level-variance in the model. Although the model has relatively low predictive abilities, it reveals several relationships between variables that have been previously unexplored. We were specifi-

cally interested in whether a climate for learning perceived as valuing diverse people, perspectives, and ideas was positively related to students' ODC. We applied Bronfenbrenner's (2005) theoretical framework that suggests student learning, including learning related to ODC, must be understood within specific contexts proximal to students' experiences, such as a classroom, and affected by students' perceptions of the climate for learning. As such, we built upon previous studies that have found that curricular diversity and faculty members' pedagogical practices such as cooperative learning, conversations among diverse students, reflection, and active teaching and assessment enhance students' preparation for living in a broadly diverse society (Cabrera et al., 2002; Denson, 2009; Engberg, 2007; Gurin, Nagda, & Lopez, 2004; Mayhew & Fernandez, 2007; Reason, Cox, Quaye, et al., 2010).

Our findings take these previous studies of faculty teaching practices a step further, substantiating, as Bronfenbrenner's (2005) theory would predict, that the climate for learning in which teaching occurs is also important for increasing students' ODC. Students' perceptions of a climate for learning that places importance upon being open to new ideas and perspectives account for almost all of the variance we were able to explain in our models. Perceived support for exploring diverse perspectives, cultures, and worldviews contributed to increasing students' ODC. We argue that faculty members are largely responsible for how students perceive the climate for learning. Faculty members influence the climate for learning through multiple mechanisms at multiple levels: setting institutional academic policies, structuring curricula, and decide what to teach and how to design opportunities for learning in the classroom. Bronfenbrenner (2005) suggests that all of these mechanisms influence learning, but the proximity of the classroom environment to student learning is likely to be most powerful.

If we accept previous research findings (Pascarella & Terenzini, 2005) that faculty members are the most important socialization agents on a college campus, our findings suggest that faculty members should indeed be trained and encouraged to create climates for learning that support ODC. To foster such a climate for learning, faculty members should engage students in the exploration of diverse worldviews

both inside the classroom and in their more informal interactions with students. Notably, perceived climates for learning that expected evidence to support new and controversial ideas were significantly related to students' ODC. This finding suggests that climates for learning should both encourage students to explore new ideas and provide evidence to support their claims and perspectives.

Other studies have found that required diversity courses may increase students' sense of social agency and advocacy for inclusion (Nelson Laird, 2005; Zuniga et al., 2005) and that courses that promote the exploration of diverse identity groups can increase students' pluralistic orientation (Engberg, 2007). Our results lend credence to continuing to offer courses that explore diverse cultures and worldviews as part of students' undergraduate curricula or otherwise encouraging students to take these kinds of courses; such courses, in and of themselves, however, may not be enough. Our results suggest that integrating different cultural perspectives across the curriculum, a practice that might have a greater effect on creating campus climates that support ODC (Reason, Cox, McIntosh, et al., 2010), would be more likely to influence students' ODC even in the absence of required diversity courses. These practices contribute to a climate for learning that values diverse people and perspectives and that supports ODC.

Faculty members facilitate learning new ideas and perspectives across difference by bringing diverse students together (Gurin et al., 2004), particularly through sustained interactions (Bowman, 2012; Chang et al., 2006). Within these diverse groups, discussions of controversial topics can increase students' ODC (Pascarella et al., 1996). Our study found that a climate for learning that encourages students to research and explore controversial issues using evidence-based claims and where students perceive faculty as helpful in thinking through new and challenging perspectives and ideas was also positively related to students' ODC. This climate for learning can be cultivated through faculty practice of corresponding pedagogical approaches. Such practices can be integrated into faculty teaching without becoming yet another add-on and ought to be encouraged by faculty development programs typically found in centers for teaching and learning or teaching excel-

lence. These programs could draw upon faculty members skilled in facilitating research, exploration, and conversation around controversial issues to mentor their colleagues or as part of new faculty orientation or recurring faculty development workshops. While contributing to a climate for learning that is positively related to ODC, we also believe helping students consider new and challenging perspectives and engage in purposeful discussion of "hot" topics in college prepares them to engage both with their campus community and the society that awaits them upon graduation.

Lastly, our results indicated that both class year and race (non-White) contributed to students' increased openness to diversity and challenge. Whitt et al. (2001) also found that openness to diversity and challenge increased with year in school and we argue that this finding helps affirm the success of exposing students to structural and curricular diversity in college, along with interactions with diverse others (Gurin et al., 2002; Hurtado et al., 1999). Being a student of color was significantly related to higher ODC until Model 3, when the students' perceptions of the climate for learning were introduced, indicating that students' ODC can be influenced by the climate for learning regardless of student's race. White students, who report lower levels of ODC in the absence of a supportive climate for learning, can be influenced through good pedagogical practices and strong faculty advocacy for respecting diverse ideas.

Conclusion

Our findings have important implications for the role faculty members, their pedagogy, and the content and nature of the curriculum play in shaping the climate for learning and increasing students' ODC. Faculty members are the intellectual leaders of campus, who, by encouraging the exploration of different cultures and perspectives and teaching about diverse perspectives can significantly increase students' ODC. Our findings reinforce the assertion that faculty members are important socialization agents on a college campus, showing faculty members who encourage the exploration of diverse perspectives and worldviews in the classroom and challenge students to wrestle with new ideas in their

teaching and advising help increase students' openness to diversity and challenge.

ODC is an essential civic skill, required for thriving in our increasingly diverse, democratic society (Gutmann, 1987; Hamrick, 1998; Hurtado, 2007). Providing for the intentional development of this skill is no longer optional and must become part of the curricular policies and pedagogical practices of faculty members and higher education leaders in the 21st century. Fortunately, the results of our study suggest that faculty members do have influence over the development of these 21st century skills, not only through particular pedagogical practices they might infuse into the classroom, but—perhaps equally importantly—through the creation and maintenance of a campus climate for learning that values ODC.

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