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As students' precollege environments (e.g., schools, neighborhoods) become increasingly segregated along racial and socioeconomic lines, the college years can provide a meaningful—and perhaps first—opportunity for students to interact with diverse peers. Existing research has established that attending more racially and ethnically diverse institutions can facilitate increased cross-racial interactions, which in turn can yield a variety of educational benefits for students (Antonio, 2001; Chang, 1999; Chang, Denson, Saenz, & Misa, 2006; Gurin, 1999; Hurtado, 2003; Saenz, Ngai, & Hurtado, 2007). In light of the ongoing judicial debates over desegregation and affirmative action policies, understanding how students can derive benefits from integrated educational settings continues to be a salient empirical goal.

This study explores how students' precollege racial environments shape their diversity experiences in college. It also tests whether diverse college experiences could interrupt the cyclical effects of segregation (Braddock, 1980). Braddock's (1980, 1985) research on the "perpetuation hypothesis" found that desegregation practices that resulted in more integrated educational

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environments prior to college were an efficient strategy for breaking down the cycle of segregation that can accompany segregated racial contexts, as segregation has the tendency to become self-perpetuating. Braddock's "perpetuation hypothesis" is becoming more relevant in light of a trend toward resegregation in America's schools and neighborhoods (Frankenberg, Lee, & Orfield, 2003; Reardon, Yun, & Kurlaender, 2006) coupled with the high-stakes political discourse over the educational benefits of racial and ethnic diversity in higher education. As more and more students come to college with few or no experiences with racially or ethnically diverse peers, diverse college campuses serve an increasingly prominent role in preparing students to interact with diverse peers in preparation for a pluralistic society.

Research on the effects of racial and ethnic diversity on student outcomes has established some important main effects of the college experience on diversity outcomes, yet it has mostly neglected the potential influence of precollege measures that could indirectly influence such outcomes. Scholars who study the effects of racial and ethnic diversity in higher education settings often examine specific forms of diversity for the sake of operationalizing the topic for their inquiry. Generally, these forms of inquiry include (Gurin, Dey, Hurtado, & Gurin, 2002; Milem & Hakuta, 2000; Umbach & Kuh, 2003): (a) structural diversity, or the numerical representation or composition of a racially or ethnically diverse campus; (b) informal interactional diversity, or the frequency and quality of intergroup interaction, mostly occurring outside formal contexts such as in dorms, at campus events, and other social activities; and (c) content knowledge/classroom diversity, or learning and gaining experiences with diverse peers in the formal environment of a classroom. In this article, I argue for another form of diversity that has emerged for study, namely, precollege diversity experiences and environments that can serve as important factors for weighing the effects of diversity outcomes. That is, the effects of students' college experiences are different for groups with varying degrees of precollege exposure to racial or ethnic diversity.

The existing body of diversity research has perhaps underestimated the true effects of college experiences on diversity outcomes because it has not consistently accounted for students' varying levels of precollege exposure to diversity. This study finds that precollege experiences do in fact predispose students toward seeking out specific diversity-related activities. If the effects of diversity on students have been systematically underestimated, this finding suggests that the true educational benefits for students are, in fact, stronger and more compelling than have been established. Such a finding could potentially wield significant influence on the current legal, empirical, and policy debates on diversity in higher education.

This study is also unique in its employment of a dataset from the Preparing College Students for a Diverse Democracy (Diverse Democracy Project or DDP) project, a multi-faceted research project that collected college student

survey data from 10 public universities throughout the country (Hurtado, 2003). These data provide a unique longitudinal approach to studying the effects of students' precollege environments on diversity-related college outcomes in the contested terrain of public universities, and they further allow the investigation of the effects of predominantly White and predominantly minority precollege contexts—yet another new contribution. In addition, this study employs a unique combination of established theoretical frameworks that have assessed the long-term effects of racial segregation on students (Braddock, 1980; Feldman & Newcomb, 1969) as well as emerging diversity frameworks that have been employed in recent diversity research in higher education (Dovidio, Gaertner, Stewart, Esses, Vergert, & Hodson, 2004; Hurtado, Dey, Gurin, & Gurin, 2003). Together, these frameworks offer a rationale for study that is sensitive to the heightened political climate around diversity issues while also being responsive to the emerging trend toward resegregation in America's schools and communities.

In sum, this study examines two critical processes: (a) how precollege environments and experiences can shape college diversity outcomes, and (b) how college diversity experiences can serve to interrupt the cycle of segregation that Braddock (1980, 1985) has posited. The key hypotheses under investigation are whether students' precollege racial environments and experiences have significant effects on their college experiences with diverse peers, and whether diversity experiences in college can have a positive effect on student behaviors related to interactional diversity. Accordingly, this study focused on the effects of students' precollege and college experiences on the diversity outcome of positive interactions with diverse peers, a college outcome that assessed students' frequency of interactions with diverse peers that were positive in nature (see also Saenz et al., 2007). This outcome measure serves as a proxy for testing the cyclical effects of segregation posited by Braddock's (1980, 1985) perpetuation hypothesis.

The "Resegregation" of America's Schools

The testing of the perpetuation hypothesis among college students is especially relevant in light of the ongoing shift toward racial and ethnic resegregation in America. Noted scholars and observers (Kozol, 2006; Orfield & Gordon, 2001; Massey, Charles, Lundy, & Fischer, 2003; Reardon, Yun, & Kurlaender, 2006; Sugrue, 1999) have increasingly argued that racial segregation has become the norm in K-12 schools, as most students today are less likely to encounter members of other racial groups in their respective classrooms, schools, or neighborhoods. Almost all of the largest cities in America have predominantly minority school districts, with most of them surrounded by overwhelmingly White suburban school districts (Orfield & Gordon, 2001; Reardon et al., 2006; Sugrue, 1999). Massey et al. (2003) argue that schools

are increasingly segregated along socio-economic distinctions, raising more research questions about the dynamics of interaction along both racial and class lines. Sugrue (1999) notes that today's primary and secondary schools are about as segregated as schools were prior to the 1954 Brown decision.

In their examination of resegregation trends across the United States, Frankenberg et al. (2003) found that advances in desegregation from the 1950s to the 1990s had now begun to recede to levels not seen in 30 years. The authors first noted that the school-age population in general was becoming more racially and ethnically diverse, as minority student enrollment accounted for close to 40% of all U.S. public school students, nearly twice the share of minority school students during the 1960s. Despite this increasing racial and ethnic diversity in the student pool, the authors found that schools in general had become increasingly segregated across the country. White students were the most segregated group in the nation's public and private schools, attending schools that were on average 80% White. Asian students lived in the nation's most integrated communities and were the least segregated in schools among all student groups.

More than 70% of the nation's Black students attend predominantly minority schools (Frankenberg et al., 2003). During the 1990s, the proportion of Black students in majority White schools decreased by 13%, the lowest level since 1968 (Frankenberg et al., 2003; Orfield & Gordon, 2001). Meanwhile, Latino students are the most segregated minority group in schools, segregated by race, poverty, and more recently, linguistic and immigrant characteristics. On average, Blacks and Latinos attended schools where more than half of the students are of their own group. Latinos attend schools with far higher average Black populations than Whites do, and Blacks attend schools with much higher average Latino enrollments.

These trends toward the resegregation of America's schools are astounding and pervasive, and they have significant policy implications. One important implication is that the schools in which minority students are increasingly concentrated are among the most underresourced, most understaffed, most poverty-stricken, and most neglected schools in the country. In his review of data from the National Longitudinal Survey of Youth, Trent (1997) found that African American students were much more likely than any other group to be enrolled in schools with high concentrations of poverty. The visions of equality of opportunity and educational experiences offered by the *Brown* decision have been usurped by harsh demographic and educational realities.

Another important implication of this resegregation trend is that students are increasingly less likely to live in diverse communities or attend diverse schools, curtailing their opportunities for meaningful diversity experiences prior to college. Students coming to college are increasingly less likely to have had a wide variety of precollege exposure to diverse neighborhoods, schools, and peers. This exposure or lack thereof can potentially affect student de-

velopment in complex ways. Sugrue (1999) observes that racial separation, especially in the adolescent years, could potentially foster negative effects, allowing stereotypes and myths about other racial and ethnic groups to flourish because students lack direct experiences that can contradict or challenge their misinformed opinions. Braddock (1985) notes that high school desegregation efforts that have sought to integrate educational environments could help to ameliorate the "avoidance learning" that more racially segregated contexts often create. In investigating the "perpetuation hypothesis," he found that desegregation practices in schools were an efficient strategy for breaking down the cycle of segregation that can operate at cognitive, affective, and behavioral levels for students. Massey et al. (2003) argue that it is crucially important to understand the educational and environmental settings in which students grow up and mature, as such settings are strongly influenced by school segregation.

The conclusion reached by these scholars is significant: students' precollege environments and experiences can shape attitudes and behaviors after high school in significant ways. As racial, ethnic, and class divisions are increasingly reinforced by our segregated educational systems, the college environment increasingly becomes the first meaningful opportunity that many students have to interact with racial/ethnic diverse peers. This pattern, in turn, raises the importance of empirically understanding students' precollege environments and experiences with diversity. In light of the resegregation of schools and neighborhoods, as well as the policy need to understand all facets of the educational benefits of diversity in college, investigating the precollege diversity environments and experiences of students is becoming even more relevant. As Braddock (1980) asked: Is racial/ethnic segregation a perpetuating force for students' postsecondary experiences? Or can diverse college environments and experiences begin to interrupt and perhaps even break the cycle of segregation?

Frameworks for Segregation and Diversity

Various conceptual frameworks address these key questions, including: the perpetuation hypothesis framework focused on the long-term effects of segregation (Braddock, 1980); the accentuation effects framework focused on the lingering effects of college students' predispositions (Feldman & Newcomb, 1969); and the diversity frameworks of more contemporary researchers focused on understanding the educational benefits that can be derived from racially/ethnically diverse environments (Dovidio et al., 2004; Gurin, Dey, Hurtado, & Gurin, 2002; Hurtado et al., 2003).

The key conceptual framework for this study is Braddock's (1980, 1985) notion of a cycle of segregation, which describes the tendency of racially segregated educational and residential environments to become perpetual

(i.e., the perpetuation hypothesis). Feldman and Newcomb's (1969) accentuation framework is complementary in operationalizing the "perpetual effects" of segregated precollege racial environments, as it suggests that students' initial predispositions in behaviors and attitudes tend to be accentuated or reinforced by the college experience. Both theories posit that precollege patterns of cross-racial interactions will predominate and are the determining factors in observations of campus segregation. That is, I hypothesize that observable patterns of cross-racial interactions in the early college years are largely a product of students' prior socialization in homogenous precollege contexts, reinforcing the notion of a perpetuation effect.

This study also tests an alternative hypothesis, namely, the potential of college diversity experiences to interrupt such perpetuation effects. Accordingly, I use a theoretical framework offered by Hurtado et al. (2003) that establishes the impact of diverse college environments on college student learning and democratic outcomes (see also Gurin et al., 2002). Dovidio et al. (2004) have further expanded on this framework by making conceptual links between racial/ethnic diversity as an educational intervention and the resultant cognitive and affective processes that can result for students. Together, these two frameworks offer a rationale for studying racial and ethnic diversity that is sensitive to the heightened political climate. They respond to the policy debate over the benefits of diverse learning environments by outlining a set of key educational outcomes that can be empirically assessed. These frameworks—about how precollege racialized contexts can have long-term effects on student behaviors and about how diverse college environments and experiences can contribute to mediating such student behaviors—served as the foundational rationale for the present study and helped to guide the choice of key measures for analysis.

Studying issues of racial and ethnic diversity among college students requires careful consideration of the myriad ways one can conceive of diversity, define diversity, measure experiences with diversity, and assess the educational benefits of diversity. For instance, in studying how diversity affects a given student, we would need to operationalize what type of diversity was being studied (i.e., structural, interactional, precollege experiences), we would need to account for appropriate control measures (i.e., demographic characteristics, precollege measures, high school type, frequency of interactions with diverse peers), and then identify theory-based outcome measures (i.e., learning outcomes, frequency of positive cross-racial interactions) to assess the educational benefits of diversity. Taken together, these frameworks offer a roadmap with which to investigate both the hypothesized perpetuation effects of precollege racial environments as well as the alternative hypothesis of interruption effects that can result from diverse college environments and experiences.

Perpetuation and Accentuation Effects of Precollege Environments

One of the first scholars to address the impact of precollege diversity experiences on college outcomes was Jomills Braddock (1980, 1985), whose work examined the consequences of racial integration efforts across the educational pipeline. He tested the hypothesis that Black students who attended racially integrated high schools were more likely to attend more racially/ethnically diverse colleges compared to their peers who attended racially segregated high schools. His main assumption was that racial segregation in America, across various contexts, had the tendency to become self-perpetuating—hence the phrase "perpetuation hypothesis." His analyses employed structural equation modeling to construct a causal model that included academic indicators, college inducements, academic reputation/quality, and a measure of high school segregation (1980, 1985). More importantly, his work reinforced the finding that precollege diversity experiences have the potential to positively affect college outcomes, a key rationale in this study. On the other hand, his work also asserted that racially segregated precollege settings do not nurture environments that provide opportunities for meaningful student interactions across race.

A more recent study by Milem and Umbach (2002) explored how students' expectations for involvement in diversity-related activities in college varied by racial background and how their exposure to racial/ethnic diversity prior to college affected these expectations. The researchers used survey data about first-year students at the University of Maryland, and their dependent measure was a factor item that assessed students' "plans to engage in a diversity-related activity in college." They found that White students' precollege exposure to diversity was a key predictor for their plans to engage in a diverse activity in college, suggesting that White students were least likely to be prepared to engage with diversity in college. My study helps to confirm that precollege diversity measures are critical indicators for assessing college diversity experiences, and its findings further imply that precollege measures do offer an additional level of insight not otherwise available in prior research.

Continuing on the issue of precollege experiences, Feldman and Newcomb (1969) found that student predispositions in behaviors and attitudes tend to be accentuated or reinforced by the college experience. Students are predisposed toward attending particular colleges, joining specific types of peer groups in college, and enrolling in courses aligned with their interests, which results in the accentuation of particular attitudes, beliefs, and experiences. Nonetheless, accentuation effects do not apply unilaterally to every college student in every setting, as students' attitudes and behaviors can be "interrupted" or altered by a set of factors in the college environment. Feldman and Newcomb (1969) corroborate this point, as the accentuation

of incoming attitudes or behaviors must be stated conditionally, based on students' initial characteristics and predispositions. Laird, Engberg, and Hurtado (2005) suggest that diversity coursework and other co-curricular activities are settings in which student behaviors are either interrupted or accentuated based on their entering characteristics or predispositions. Accordingly, the phenomenon of accentuation theory serves as an important complementary framework with which to investigate whether specific college experiences can interrupt or perpetuate the effects of segregated precollege environments on student diversity outcomes.

Diversity Frameworks in the College Environment

On the topic of diversity outcomes in college, Hurtado et al. (2003) have explored the interplay among individuals, their diverse collegiate environments, and how these experiences are related to educational benefits for students. The key question they address is whether racial and ethnic diversity in the college environment is a critical factor contributing to student learning and development. The theoretical rationale for their inquiry invokes the works of developmental and cognitive theorists such as Erickson, Newcomb, Piaget, Ruble, and Allport, among others. The authors (Hurtado et al., 2003) argue that a racially and ethnically diverse college environment provides the discontinuity and disequilibrium needed to challenge students' views of the world and thus improve their capacity both to look at multiple perspectives and to change their behavior. In short, the fusion of the theorists that they employ offers a clear rationale for the educational benefits that can be derived in racially and ethnically diverse college environments.

Two types of student outcomes in particular—learning and democratic outcomes—have received a fair amount of theoretical attention in the research literature on diversity (Gurin, 1999; Gurin et al., 2002). These two outcomes are targeted because they speak directly to the "compelling educational interests" dictum of the diversity rationale as supported by the U.S. Supreme Court ruling in *Grutter v. Bollinger*. No longer can the idealistic aims of diversity efforts be taken for granted, as the diversity framework (Gurin et al., 2002; Hurtado et al., 2003) offers a significant paradigm with which to investigate the educational benefits of diversity. While the research that examined the effects of diversity on education was of critical legal significance, the construction of a theoretical foundation was an essential strategy in enhancing the rigor of the empirical evidence for diversity.

The diversity frameworks of Hurtado et al. (2003) and Gurin et al. (2002) have been extended by some social psychologists who have made conceptual links between diversity as an educational intervention and the resultant cognitive and affective processes that are engendered. For instance, Dovidio et al. (2004) propose that exposure to diverse curricular content and interactions with diverse peers are both key ingredients in developing positive

or changed attitudes about others, ultimately leading to reductions in bias. These scholars argue that, while knowledge of others and contact with others can have direct effects on reducing bias, other mediating processes also work to shape this outcome. Increased knowledge of and contact with others can lead students to reconsider or change their behaviors and attitudes by reshaping their perceptions of and empathy for other groups. Dovidio et al. (2004) contend that diverse college environments in which students are actively learning from and interacting with each other can quell the anxiety and discomfort that often lead to avoidance and hostility—or what Braddock (1980) would term "avoidance learning."

In this way, these theoretical frameworks serve not to contradict but rather to complement the Braddock (1980) and Feldman and Newcomb (1969) frameworks. Together, they work to test both the perpetuation effects of racial segregation and also the interrupting effects that can be engendered by racially and ethnically diverse environments and experiences in the early college years. Given the policy-relevance of the study, this confluence of frameworks and outcome measures served as important lenses with which to investigate the effects of both precollege and college diversity experiences for students. The empirical benefits of diversity are more contested than ever, especially at public universities; and any work that can employ proven frameworks to assess relevant student diversity outcomes is increasingly important.

Methodology

The two main hypotheses under investigation in this study were: (a) Precollege racial experiences have persistent effects on students' interactions with diverse peers in college; and (b) Students' diverse college experiences can help to enhance their positive interactions with diverse peers and thus serve to interrupt the cyclical and negative effects of segregation. These hypotheses necessitated a quantitative research design that could untangle a plethora of precollege, background, and college experience variables. Thus, the analytic framework for the present study was based partly on the notion that precollege and college measures as well as college environments represent important predictors of students' diversity outcomes such as positive cross-racial interaction (CRI).

Data

The dataset that this study employs was collected as part of the project on Preparing College Students for a Diverse Democracy (DDP) at the University of Michigan. The DDP offers a recent (2000–2002) longitudinal data collection design that includes a rich set of precollege data, including information on students' precollege and college experiences with diversity. Specifically, the longitudinal data collection effort surveyed students at college entry

(administered in the fall of 2000) and again at the end of their second year (administered in the spring of 2002). Survey participation was restricted to students who matriculated in fall 2000 to one of the 10 participating public universities.

The 2000 survey of first-year students was designed to assess how students' exposure to diversity through formal and informal interactions influenced their cognitive, social-cognitive, and democratic learning and development (Hurtado, 2003). It focused primarily on students' precollege experiences with diversity. The first-year survey was administered to students during orientation sessions, and additional waves were distributed in courses that attracted a large number of first-year students. The follow-up survey was administered to students at the end of their second year of college using multiple waves of both paper and web-based surveys. It assessed the broad impact of college diversity experiences, including questions about students' interactions with diverse peers.

Sample

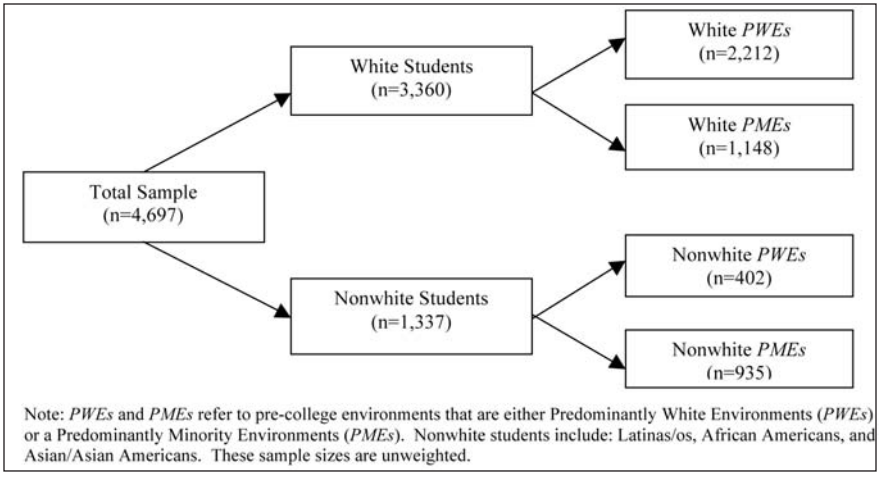
After one of the participating campuses was dropped from the longitudinal study due to an extremely low follow-up survey response rate, the remaining nine campuses had a total response rate for the first survey of about 36% (n = 13,520) of all first-time full-time students. A second survey followed up with respondents to the first survey; this second survey had a response rate of 35% (n = 4,757) (Hurtado, 2003), resulting in a longitudinal response rate of about 12.7% based on the population of all first-time full-time students at these nine institutions. To correct for the low response rates and generalize their results to the original sample population, statistical weights were created to account for response bias in each survey (Hurtado, 2003).

In addition, a review of missing values revealed a small range of missing data (0% to 10%) across all variables in this study. Missing values were replaced using the EM algorithm, a general method for obtaining maximum likelihood (ML) estimates when a small proportion of the data is missing (Allison, 2002). The EM algorithm consists of an expectation step and a maximization step, repeated many times in an iterative process that eventually converges to the ML estimates. Unlike conventional regression imputation, in which decisions must be made on which variables to use as predictors, the EM algorithm starts with a full covariance matrix and uses all available variables as predictors for imputing missing data (Allison, 2002). Finally, while Native American students were included in the DDP study, they were excluded from this study due to their low representation in the sample.

The final longitudinal dataset contained 4,697 college students from nine public research universities from across the country that completed both the first- and second-year surveys. The sample consisted of 1,509 men (32.1%) and 3,188 women (67.9%) as well as students from four racial or

ethnic groups as follows: African American/Blacks (n = 220, 4.7%); Asian American/Pacific Islander (n = 747, 15.0%); Hispanic/Latino (n = 370, 7.9%); and White/Caucasian (n = 3,088, 71.5%). Their median age at college entry in the fall of 2000 was 18, and their median combined SAT score was 1200. Their parents' median income in 2000 was approximately $60,000 per year. Over 88% of the students in this sample graduated from public high schools, and just over half (55.6%) came from neighborhoods and schools that were all or mostly all White (precollege racial environments).

The precollege racial environments were defined as predominantly White (PWEs) or predominantly minority (PMEs), and students were further classified into White and non-White categories. Figure 1 describes the total sample as well as the disaggregations used to identify these four subgroups based on background characteristics and precollege racial environments. The four subgroups were: (a) White students from PWEs (n = 2,212), (b) White students from PMEs (n = 1,148), (c) non-White students from PWEs (n = 402), and (d) non-White students from PMEs (n = 935).



Note: *PWEs* and *PMEs* refer to pre-college environments that are either Predominantly White Environments (*PWEs*) or a Predominantly Minority Environments (*PMEs*). Nonwhite students include: Latinas/os, African Americans, and Asian/Asian Americans. These sample sizes are unweighted.

Figure 1. Study Sample

Measures

Outcome Measure

This study employed the student diversity outcome of frequency of positive cross-racial interactions (CRI) with diverse peers, an outcome measure that has already been documented in prior research (Saenz et al., 2007). Positive

TABLE 1

FACTOR LOADINGS AND RELIABILITIES FOR POSITIVE CRI ACROSS THE FOUR SUBGROUPS

	White/ PWEs	*White/ PMEs*	*Non-White/ PWEs*	*Non-White/ PMEs*
Positive Cross-Racial Interactions	**α=.88**	**α=.88**	**α=.87**	**α=.88**
Dined or shared a meal	.72	.75	.72	.74
Had meaningful and honest discussions about race/ethnic relations outside of class	.70	.70	.76	.71
Shared personal feelings and problems	.80	.79	.72	.79
Studied or prepared for class	.68	.67	.63	.63
Socialized or partied	.74	.74	.70	.75
Had intellectual discussions outside of class	.87	.83	.87	.80

Note: "PWEs" and "PME*s*" are acronyms for "predominantly White" or "predominantly minority pre-college" environments. Non-White students include African Americans, Asian/Asian Americans, Hispanics/Latinos.
Source: This outcome measure was used from the Diverse Democracy Longitudinal Dataset (Hurtado, 2003a).

CRI is a six-item behavioral factor scale that assesses students' levels of cross-racial interactions that are positive in nature, measuring the frequency and quality of students' interactions with diverse others. I identified the Positive CRI factor through exploratory factor analyses run on the entire sample using principal axis factoring and varimax rotation. The results from these factor analyses yielded a factor reliability that indicated an acceptable internal consistency (alpha = .88) for this factor scale (Tabachnick & Fidell, 2001). I ran confirmatory factor analyses across the four student subgroups (see Table 1), and the Cronbach alphas ranged from 0.87 to 0.88, indicating a strong construct consistency across each subgroup of interest. The Positive CRI scale did not have an exact pretest measure available, and instead I controlled for the frequency and variety of cross-racial interactions using the same pre-test measure as with the Interactions with Diverse Peers outcome.

The outcome measure in this study represents a theoretically informed and tested measure to assess the potential benefits that can lead from diverse experiences and environments. Many scholars (Antonio, 1998; Chang, 1996; Chang, Astin, & Kim, 2004; Saenz et al., 2007) have employed cross-racial interaction outcomes because they speak directly to the "compelling educational interests" dictum of the diversity rationale. Namely, as students

increase their frequency of interactions with diverse peers, there is a stronger likelihood of additional benefits flowing from such experiences. Examining the conditions that contribute to cross-racial interactions that are positive in nature (Positive CRI outcome) offers a new level of understanding about diversity experiences for students.

Independent Measures

The primary independent variables for this study consisted of both students' precollege experiences and expectations and also their key early college experiences and views. The DDP longitudinal data explicitly assessed how students' experiences with diverse peers, through formal and informal interactions, influenced their cognitive, social-cognitive, and democratic learning and development; thus, these survey data were most useful in offering appropriate precollege and early college experience measures for the analyses. A majority of these survey items utilized Likert scales with 3 to 5 categories. Appendix A offers a summary of the precollege and background measures that this study employed, while Appendix B lists college experiences, attitudes, and environments. I thoroughly tested each of the independent measures through a bi-variate correlation matrix and through tests of normality, and I also tested factor measures through confirmatory factor analysis and reliability analysis, taking careful note of the analytic limitations of two-item factors employed in the study.

Identifying appropriate student background and precollege measures was important in ascertaining a proper model specification for the statistical analyses performed in this study. Because student input variables are often related to both environmental and outcome variables, it is critical to first account for them in any analyses. Background characteristics in this study included gender, socioeconomic status (as defined by family income and parental involvement), and high school type (public or private). I used race variables (e.g., White, African American, etc.) only to identify the four subgroups for the regression analyses. This study also employed various precollege measures that assessed students' interactions with diverse others, students' anxieties over interacting with diverse others, students' expectations for getting to know diverse others, and even a measure on how often students studied with diverse peers in high school. Including these measures allowed me to explore the net effects of diversity experiences in college after accounting for critical precollege inputs that may have exerted much greater influence on students' experiences in college than originally thought.

Analysis

The analytic framework for this study required data that described the student at the point of entry into college, environmental data that described

institutional characteristics and students' college experiences, and outcome data that described the student after exposure to the college environment. I therefore performed the quantitative analyses for this study in two stages. I designed these two phases to be complementary, as descriptive analyses often raise causal questions, while causal analyses are greatly informed by descriptive results (Astin, 1991). The first phase featured a descriptive approach that employed t-tests, ANOVAs, and post-hoc tests to explore the dataset and establish key relationships and differences among the four subgroups on the outcome measure of Positive CRI.

The second phase of the analyses employed hierarchical multiple regression to build a multivariate model that could test the hypotheses under investigation. Hierarchical multiple regressions, also known as sequential regression models, allow the researcher to control the regression process by ordering independent variables in accordance with a theoretical framework or a hypothesis under investigation. Ultimately, hierarchical multiple regression allows the researcher to examine the amount of variance in the outcome measure that is accounted for by a set of temporally ordered independent variables, above and beyond that accounted for by an earlier block of variables.

I first conducted a multivariate regression for the total sample and then for each subgroup for a total of five regression models. I ran all regressions using the forced entry method, which forcibly entered each input measure into the regression model in a predetermined order. Further, all regression models utilized a total of seven blocks (or groups of variables).

For the regression model that employed the total sample (unweighted n = 4,697), I summarized results by displaying the simple correlations (r), the standardized regression coefficients once all the precollege variables were controlled (B_{pc}), and the standardized regression coefficients once the model accounted for all of the variables (B_f). I summarized the results of the regression analyses on the four subgroups by displaying the simple correlations (r) and unstandardized regression coefficients (*b*) once I had forcibly entered all of the variables into the model. It should be noted that the regression models were run with the same set and order of variables to facilitate comparisons from one subgroup to another. I used unstandardized regression coefficients (*b*) for comparison purposes here to evaluate beta coefficients across each of the four subgroups.

Comparing unstandardized regression coefficients (*b*) allowed me to make conjectures about how one specific precollege or college experience showed a greater predictive strength for White students from PWEs as compared to the other three subgroups on the outcome of Positive CRI. I compared some of the *b* coefficients across each of the four subgroups using two-tailed t-tests (Jaeger, 1990) to determine whether the effect of a measure on one group was significantly different than its effect on another. I set the critical

p-value to determine t-test significance at $p < .005$. I conducted the t-tests (suggested by Sax, Bryant, & Harper, 2005) as follows: (b = beta coefficient; S_B = standard error of B; 1 = first subgroup; 2 = second subgroup):

$$t = \frac{b_1 - b_2}{\sqrt{S_{b1}^2 + S_{b2}^2}}$$

In the end, the total sample and subgroup regressions allowed me to examine a myriad of direct and indirect paths (or effects) available among the variables of interest by examining differences in *b* coefficients.

Results

Post-Hoc Tests

Frst, I investigated specific between-group differences on the outcome measure of Positive CRI among the four subgroups using Scheffe's post-hoc test of mean difference. This test is useful for comparing mean differences across independent samples when the sample sizes are not equal (SPSS, 2003). White students from PWEs reported the lowest mean score on the Positive CRI scale ($\mu = 2.33$, $p < .001$) at the end of the second year of college as compared to all other subgroups. White students from PMEs ($\mu = 2.47$) also reported significantly lower scores on this measure as compared to non-White students from PWEs ($p < .001$) and PMEs ($p < .05$).

Non-White students from PWEs ($\mu = 2.68$) and PMEs ($\mu = 2.56$) showed a significant between-group difference on the measure for Positive CRI ($p < .05$). Nonetheless, the two non-White student subgroups scored significantly higher on this factor scale than their White counterparts, indicating a strong inclination toward greater interactions of a positive quality with diverse peers in the college environment. Having scored highest of all subgroups on this critical outcome measure, non-White students from PWEs seem to be most prepared to engage in Positive CRI, perhaps as a direct result of precollege experiences with diversity that may have exposed them to more opportunities for interacting with diverse racial/ethnic peers. I examine this conjecture more carefully in the multivariate modeling to follow.

Regression Results for the Total Sample

The model regressed students' frequency of positive cross-racial interactions (Positive CRI) at the end of the second college year on students' precollege and college experiences. The six-item factor scale for Positive CRI offers a unique perspective into the types of precollege and college measures that contribute to this important college diversity outcome. The

TABLE 2

SCHEFFE'S POST-HOC TEST OF MEAN DIFFERENCE: POSITIVE CROSS-RACIAL INTERACTION (FOLLOW-UP SURVEY)

Student Groups	*Mean (μ) [sd]*	*White Students*		*Non-White Students*	
		PWEs (n=2,212)	*PMEs (n=1,148)*	*PWEs (n=402)*	*PMEs (n=935)*
White/PWEs	2.33 [.71]				
White/PMEs	2.47 [.72]	***			
Nonwhite/PWEs	2.68 [.68]	***	***		
Nonwhite/PMEs	2.56 [.69]	***	*	*	

Scale: Low positive CRI (0.75) to High positive CRI (3.75).
Note: "PWEs" and "PME*s*" are acronyms for "predominantly White" or "predominantly minority pre-college" environments.
Non-White students include African Americans, Asian/Asian Americans, Hispanics/Latinos.
Significance: **p<.01; ***p<.001. Data are weighted. [sd]: [standard deviation]

full regression model accounts for 30% of the variance in the outcome (Adj. $R^2 = .30$), a relatively high value considering the lack of a direct pre-test measure for Positive CRI. Indeed, the most relevant pre-test measure available is the frequency of students' precollege Interactions with Diverse Peers. This precollege measure has a high simple correlation ($r = .26$, $p < .001$) and a strong final relationship ($B_f = .11$, $p < .001$) with Positive CRI. These correlations establish that a student's frequency of interactions with different racial or ethnic groups prior to college is highly related to the positive quality of interactions that students will have with diverse peers in college. (See Table 3 for full results.)

In other findings for background characteristics (Block I), females ($B_{pc} = .05$, $p < .001$) appear more likely than males to report higher levels of Positive CRI, although this significant relationship is mostly explained by the final block ($B_f = .02$, $p < .10$). Non-White students from PWEs ($B_f = .06$, $p < .001$) are significantly more likely than their White counterparts from PWEs to report increased scores on the factor. White students from PMEs have an initial positive correlation with the outcome factor ($B_f = .02$, $p < .10$), although this relationship is revealed as negative ($B_f = -.03$, $p < .10$) when compared with their White counterparts from PWEs once the model has accounted for students' precollege Interactions with Diverse Peers. These

Table 3

Regression, Positive Cross- Racial Interactions

Total sample (n = 4,697)

VARIABLE	*r*	*II (Bpc)*	*IV (Bf)*
I. Pre-Test & Background Characteristics			
Interactions with diverse peers (Time 1)	.26***	.13***	.11***
Gender (female)	.07***	.05***	.02+
Family SES level (parents' ed. and income)	.06***	.04**	.01
High school type (public)	-.03*	-.01	.01
SAT (math + verbal)	.07***	.07***	.03+
Whites at PMEs (Whites/PWEs)	.02+	-.02	-.03+
Nonwhites at PWEs (Whites/PWEs)	.10***	.06***	.06***
Nonwhites at PMEs (Whites/PWEs)	.09***	.03	.00
			Adjusted R^2=.10
II. Pre-College Environment and Experiences			
Racial composition of friends (all White)	-.12***	.02	.00
Discussed racial/ethnic issues in HS	.23***	.10***	.06***
Studied with other racial/ethnic groups in HS	.31***	.18***	.14***
Freq: Encountered racial discrimination in HS	.07***	.01	.00
Freq: Encountered economic discrimination in HS	.03*	.00	.00
Expect to take a diversity course in college	.13***	.02	-.01
Expect to know diverse others in college	.25***	.14***	.09***
Anxiety about interactions w/different races	-.10***	-.06***	-.05***
			Adjusted R^2=.17
III. Structural Diversity			
Percent non-White	.13***	.07***	
			Adjusted R^2=.17
IV. College Environments			
Live on campus	.05***		-.02
Major: Engineer	-.05***		.01
Participated in academic support services	.16***		.08***
Participated in leadership training	.13***		.00
Hours per week working for pay	.03*		.03*
Hours per week socializing	.23***		.17***
			Adjusted R^2=.23
V. College Experiences (segregated contexts)			
Participated in Greek org.	.05***		-.03*
Joined an org. reflecting my own cultural heritage	.11***		-.02
Lived in a culturally-themed residence	.06***		-.01
			Adjusted R^2=.24
VI. College Experiences (diversity curricular/ co-curricular activities)			
Lived w/people from different backgrounds	.32***		.19***
Joined an org. that promotes cultural diversity	.15***		.02
Participated in diversity co-curricular activities	.26***		.11***

Table 3, cont.

VARIABLE	*r*	*II (Bpc)*	*IV (Bf)*
Attended a class/seminar related to Sept. 11	.08***		.01
Enrolled in diversity courses	.17***		.02
Opportunities for classroom engagement with diverse peers	.20***		.05**
			Adjusted R^2=.29
VII. College Attitudes/Views			
Agree: At least one faculty member has taken an interest in my development.	.14***		.03*
Sense of belonging on campus	.20***		.08***
Agree: Heard faculty express stereotypes about racial/ethnic groups in class	.04**		-.02
I have been singled out because of race/gender/sex.	.08***		-.01
There is a lot of racial tension on the university campus.	.09***		.01
			Final Adjusted R^2=.30

Note: Significance: *p<.05; **p<.01; ***p<.001. B_{pc} (pc = pre-college) refers to the beta coefficients after all pre-college variables are accounted for in the model, and B_f (f = final) refers to the coefficients after all variables are accounted for in the model. Data are weighted.

findings indicate that, even after controlling for an array of precollege and college measures, students from differing precollege racial environments show mixed results on their levels of Positive CRI, regardless of their racial background. The mixed findings for White and non-White students from PWEs as well as between White students from PWEs and PMEs highlight the necessity to closely explore the subgroup regression models that may offer insights into how students within a similar precollege environment can show such disparate outcomes. These subgroup regressions are reviewed in the following section.

An interesting finding related to the racial composition of students' high school friends ($r = -.12$, $p < .001$) shows this measure (i.e., having predominantly White friends) initially having a negative correlation with Positive CRI. In essence, this finding indicates a negative association between students with all or mostly all White friends and the outcome measure. However, after the model accounts for students with all White friends, the beta is no longer significant in the final block ($B_f = .03$). Such a finding warrants more investigation, and I take it up again later in this section in the set of subgroup regression models, which reveal important group differences on this measure. In all, the first block accounts for almost a third of all the observed variance in the full regression model (Adj. $R^2 = .30$).

Among the precollege activities (Block II) of this regression model, students who reported a high frequency of studying with diverse peers (B_f = .14, $p < .001$) are significantly likely to score high on the Positive CRI scale in college, even after controlling for a wide assortment of college measures. This control measure retains the highest final beta of all the precollege variables. Discussing issues of race/ethnicity in high school ($B_f = .06$, $p < .001$) is a strong positive predictor of the outcome measure, as is having had high expectations of getting to know diverse peers in college ($B_f = .09$, $p < .001$). In contrast, students who reported increased anxiety about interacting with diverse peers in high school continue to have lower Positive CRI scores through their second college year ($B_f = -.05$, $p < .001$).

In short, several of the precollege measures show distinct effects on students' positive cross-racial interactions, confirming the saliency of the precollege experience. Each of these precollege measures offers important insights into the types of contexts that can generate or inhibit positive interactions across race during the college years. Most pertinently, the significant association between studying with diverse peers in high school and high levels of Positive CRI in college should serve as a resounding indicator of the efficacy of such high school practices in promoting such outcomes in subsequent environments. Educational institutions at every level need to look no further than this evidence to inform their intercultural practices, curricula, and programming in better preparing students for a diverse and democratic society. Simply stated, students who talk about issues of race and who study with diverse peers in high school are likely to be best prepared to positively engage diverse peers in college and perhaps beyond.

Another important finding from the full regression model is the positive predictive strength of structural diversity ($B_f = .07$, $p < .001$) on Positive CRI. As in the previous model, more racially and ethnically diverse institutions not only enhance opportunities for interactions generally (Chang, 1996; Chang, Astin, & Kim, 2004), but also generate more positive contexts in which such interactions occur. This result offers compelling new evidence for the positive effects of diverse institutional environments. This finding is a strong challenge to the belief that increased diversity leads to conflict on campus (Bloom, 1986; D'Souza, 1991; Thernstrom & Thernstrom, 1997; Rothman, Lipset, & Nevitte, 2003). Instead, this evidence suggests that increasing diversity in the student body is associated with increased positive cross-racial interactions among students. It reaffirms the important link between more diverse institutional settings and positive outcomes for students, and it also serves to reconfirm the continuing resonance of the college environment in disrupting the cycle of segregation for students. If diverse institutions do indeed promote greater positive interactions across race, then it is correct to deduce that many other educational benefits may be derived for students in such settings.

Several important college activities (Block IV) enter the model as significant predictors of Positive CRI, and they also contribute a significant increase in the variance explained (Adj. R2 grows from .17 to .23, $p < .001$). Students who spend more hours per week socializing with peers ($B_f = .17$, $p < .001$), who spend more hours per week working for pay ($B_f = .03$, $p < .05$), and who participate in academic support services ($B_f = .08$, $p < .001$) are more likely to report higher Positive CRI. Students who spend more time socializing perhaps have enhanced interpersonal skills that help to facilitate increased positive interactions with diverse peers. Students who spend more time working for pay perhaps have more opportunities to engage with diverse peers in settings that often call for positive interactions as part of their work assignments. Academic support programs tend to be positive and supportive college environments, perhaps explaining the positive relationship they have with this outcome measure. Each of these college environments offers students a myriad of opportunities to engage with diverse others in meaningful interactions, yielding a positive set of results.

Among segregated college environments (Block V), joining a sorority or fraternity ($B_f = -.03$, $p < .05$) yields a significant negative affect on Positive CRI, but only after the model controls for students who report high amounts of socializing. In other words, students in Greek organizations and who are therefore more predisposed to socializing are more likely to report higher levels of Positive CRI than their peers who are less inclined to socialize. To be sure, all three peer environment measures in this block have an initial positive correlation with the outcome measure, although they are each explained by other measures in the model, with the Greek participation measure reversing effects (once the socializing measure is accounted for). Sign reversals are observed for the other two measures within the block as well, although their final betas are not statistically significant. Nonetheless, it is worth noting that the beta coefficient for joining a same-culture organization reverses from positive to negative only after students who also participate in academic support programs are accounted for. It is also worth noting that this block of variables yields a significant increase in the variance explained by the model, increasing from 23 to 24% ($p < .001$). The results presented in this block offer important initial insights for the subsequent subgroup regression models.

Among the college diversity experiences (Block VI), several enter as significant predictors of Positive CRI including: living with students from different backgrounds ($B_f = .19$, $p < .001$), engaging in diverse co-curricular activities ($B_f = .11$, $p < .001$), and opportunities for classroom engagement with diverse peers ($B_f = .05$, $p < .01$). Each of these various college activities has a unique positive effect on the outcome measure, even after controlling for a variety of other potentially confounding precollege and college activ-

ities—thus affirming their saliency in interrupting the cycle of segregation. In particular, students who live with others from different backgrounds are extremely likely to report greater levels of Positive CRI. This finding alone offers unambiguous proof of the utility of this institutional practice in promoting this crucial diversity outcome. In fact, due to the strength of each of these final significant betas, these findings offer pertinent insights into the types of institutional and programmatic settings that can contribute to increased Positive CRI. In sum, each of these college activities represents an important institutional context for promoting Positive CRI. Further, this block of variables also contributes a significant increase in the total variance explained by the model as it grows from 24 to 29% ($p < .001$).

Amid the final set of attitudinal items (Block VII), a few important measures prove to be strong predictors of Positive CRI. Students who agree that faculty take an interest in their development ($B_f = .03, p < .05$) are significantly likely to report higher scores on the outcome scale. Students who agree that there is a strong sense of belonging on campus ($B_f = .08, p < .001$) are also likely to report higher scores on Positive CRI. Here again, this finding suggests that students who feel supported by faculty in the classroom and who feel a sense of belonging in the institutional community are likely to report more frequent Positive CRI.

Most prior research on cross-racial interactions did not have the capability to fully explore the qualitative nature of student exchanges across institutions due to lack of appropriate data (Saenz et al., 2007). Therefore, my findings lend further justification to the continual empirical need to address this deficit, the exception being the more recent studies that utilize the DDP dataset. Most pertinent is the continual significance of precollege measures in shaping students' college behaviors as well as the capacity of college diversity experiences to interrupt these effects in positive ways. The various conditions that enhance or inhibit Positive Cross-Racial Interactions among students from distinct racial backgrounds offers a new level of understanding the ways in which institutions can create the conditions for increased educational benefits.

Regression Results: Four Subgroups

Table 4 summarizes the regression results for the outcome measure Positive Cross-Racial Interactions (CRI) across the four subgroups. The Adjusted R^2 values for the four subgroups indicate that each of the models includes an appropriate collection of control measures. The equation for non-White students from PWEs displays the highest adjusted R^2 value (.36) suggesting a strong model fit for this subgroup, while the equation for White students from PWEs displays the lowest adjusted R^2 value (.26).

TABLE 4

REGRESSION RESULTS FOR POSITIVE CROSS-RACIAL INTERACTIONS: FOUR SUBGROUPS

	Whites/PWEs (n=2,212)		*Whites/PMEs (n=1,148)*		*Nonwhites/PWEs (n=402)*		*Nonwhites/PMEs (n=935)*	
Constant		*1.25****		*.87****		*1.15***		*.65**
	r	b_f	*r*	b_f	*r*	b_f	*r*	b_f
I. Pre-Test & Background Characteristics								
Interactions with diverse peers (Time 1)	.19***	.07*	.31***	.20***	.12**	.03	.28***	.18***
Gender (female)	.06**	.00	.09***	.08*	.03	-.07	.11***	.10**
Family SES level (parents' ed. and income)	.06**	-.01	.06*	.01	.07+	-.02	.18***	.02
High school type (public)	.00	.06	-.04	-.05	-.06	-.02	-.08**	-.06
		.00		.00		.00		.00
SAT (math + verbal)	.06**	B=-.01	.09**	B=.01	.14**	B=.06	.16***	B=.11***
Adjusted R^2 =	*.04*			*.11*		*.03*		*.13*
II. Pre-College Environment and Experiences								
Racial composition of friends (all White)	-.18***	-.05*	-.13***	-.02	.05	.03	.18***	.04+
Discussed racial/ethnic issues in HS	.20***	.05***	.22***	.00	.18***	.06+	.24***	.07**
Studied with other racial/ethnic groups in HS	.24***	.05***	.34***	.08***	.34***	.14***	.29***	.06***
Freq: Encountered racial discrimination in HS	.06**	.06	.08**	.05	.06	.05	-.06*	-.14***
Freq: Encountered economic discrimination in HS	.01	-.05+	.13***	.08*	-.04	-.02	.00	.04
Expect to take a diversity course in college	.10***	-.02	.12***	-.01	.18***	-.01	.14***	.03
Expect to know diverse others in college	.19***	.08***	.29***	.09***	.29***	.09+	.24***	.04
Anxiety of interactions w/different races	-.08***	-.06**	-.09***	-.03	-.22***	-.20***	-.12***	-.01
Adjusted R^2 =		*.11*		*.19*		*.20*		*.20*

III. Structural Diversity								
	.01		.01		.00		.00	
Percent non-White	.12***	B=.07***	.10***	B=.11***	.04	B=.00	.05+	B=.01
Adjusted R^2 =		*.11*		*.20*		*.20*		*.20*
IV. College Environments								
Live on campus	.02	-.06+	.13***	.04	.04	.04	.11***	-.06
Major: Engineer	-.02	.07	-.02	.03	-.16***	-.25*	-.09**	.03
Participated in academic support services	.15***	.07***	.23***	.10***	.11*	.06	.08**	.05*
Participated in leadership training	.10***	-.01	.12***	-.07	.17***	.03	.18***	.06
Hours per week working for pay	.05*	.02**	-.03	.00	.01	.01	.01	.00
Hours per week socializing	.21***	.08***	.26***	.07***	.37***	.11***	.33***	.10***
Adjusted R^2 =		*.17*		*.27*		*.29*		*.28*
V. College Experiences (segregated contexts)								
Participated in Greek org.	.02	-.11**	.08**	.00	.09*	.01	.09**	-.06
Joined an org. reflecting my own cultural heritage	.06**	-.02	.12***	-.05	-.02	-.10	.07*	-.07
Lived in a culturally themed residence	.07***	.03	.08**	.01	-.15**	-.33***	.07*	.03
Adjusted R^2 =		*.17*		*.27*		*.32*		*.28*
VI. College Experiences (diversity curricular/co-curricular activities)								
Lived w/people from different backgrounds	.35***	.35***	.29***	.21***	.20***	.21**	.30***	.18**
Joined an org. that promotes cultural diversity	.09***	-.08	.20***	.21**	.07+	-.01	.15***	.06
Participated in diversity co-curricular activities	.26***	.12***	.26***	.09***	.23***	.05	.23***	.07**
Attended a class/seminar related to Sept. 11	.09***	.05	.10***	.00	.08+	.07	.07*	-.07
Enrolled in diversity courses	.14***	.03	.21***	.02	.11*	-.11*	.25***	-.01
Opportunities for classroom engagement with diverse peers	.15***	.02	.25***	.07*	.20***	.14**	.29***	.08*
Adjusted R^2 =		*.26*		*.32*		*.36*		*.32*

Table 4, cont.

	Whites/PWEs (n=2,212)		*Whites/PMEs (n=1,148)*		*Nonwhites/PWEs (n=402)*		*Nonwhites/PMEs (n=935)*	
Constant		*1.25****		*.87****		*1.15***		*.65**
	r	b_f	*r*	b_f	*r*	b_f	*r*	b_f
VII. College Attitudes/Views								
Agree: At least one faculty member has taken an interest in my development.	.13***	.03+	.18***	.02	.12*	.00	.15***	.03+
Sense of belonging on campus	.18***	.05***	.24***	.05*	.14**	.04	.23***	.07**
Agree: Heard faculty express stereotypes about racial/ethnic groups in class	.04*	-.01	.07*	.01	.00	.00	-.06*	-.04+
I have been singled out because of race/ gender/sex.	.10***	.01	.04	-.04	.14**	.11*	-.01	-.02
There is a lot of racial tension on the university campus.	.08***	.03+	.08**	-.04	.03	-.03	.07*	.04
Final Adjusted R^2 =		*.26*		*.32*		*.36*		*.33*

Significance: +p<.10; *p<.05; **p<.01; ***p<.001. Data are weighted.
B = standardized regression coefficient.

While no direct pre-test measure is available for Positive CRI, I used the proxy measure of frequency of precollege interactions with different racial or ethnic groups. This precollege measure enters as a significant predictor of Positive CRI for White students from PWEs ($b_f = .07$, $p < .05$), White students from PMEs ($b_f = .20$, $p < .001$), and non-White students ($b_f = .18$, $p < .001$) from PMEs, suggesting that students who have high precollege interactions with diverse others are likely to also have increased positive experiences with diverse others in the college years. In this way, precollege diversity experiences can have important implications for students' diversity experiences in college.

In other results among background characteristics (Block I), White ($b_f = .08$, $p < .05$) and non-White ($b_f = .10$, $p < .01$) female students at PMEs are more likely than their respective male counterparts to report higher levels of Positive CRI, representing an important distinction when compared to the other two subgroups, which do not exhibit significant coefficients for this measure. Of special note, non-White female students from PWEs show a reversal in direction on this measure, although this change is revealed once the model controls for students' precollege anxieties with diverse interactions and for students majoring in engineering. SAT scores (math plus verbal) enter as a significant predictor of Positive CRI in college, but only for non-White students from PMEs ($b_f = .00$, $p < .001$) with a standardized beta coefficient of B = .11. For this subgroup, students with higher SAT scores seem more inclined to positively interact with diverse peers in college.

Among the precollege diversity experiences/environments variables (Block II), having an all-White peer group is a negative predictor of Positive CRI in college for White students from PWEs ($b_f = -.05$, $p < .05$) but this measure is a positive predictor for non-White students from PMEs ($b_f = .04$, $p < .10$). This measure does not result in a significant final b coefficient for the remaining subgroups. These divergent results reveal the existence of a strong interaction effect at work and offer important evidence that precollege friendship groups can have disparate affects on students' levels of positive diversity experiences in college. Antonio (1998) found similar disparate trends across White and non-White student groups based on the racial composition of their close friends. On their friendship groups alone, non-White students from PMEs who reported having all or mostly all White friends in high school have more exposure to interacting with diverse others prior to coming to college and thus are perhaps better prepared to engage students in positive diversity experiences once they arrive in college. In contrast, White students from PWEs have limited exposure to diverse peers to begin with, and those who report having all or mostly all White friends in high school limit their opportunities for engagement even further. The divergent findings presented are not surprising, as they merely confirm the saliency of students' precollege environments and experiences in shaping their college behaviors.

Another precollege measure that enters as a significant predictor for these same two subgroups—as well as for non-White students from PWEs (b_f = .06, $p < .10$)—is discussing racial/ethnic issues in high school. Both White students from PWEs ($b_f = .05$, $p < .001$) and non-White students from PMEs ($b_f = .07$, $p < .01$) were more likely to show increases in Positive CRI when they had more discussions related to racial or ethnic issues before college. One precollege measure that proves to be a positive predictor of Positive CRI for all student subgroups is studying with diverse peers in high school. This final b coefficient is highest for non-White students from PWEs ($b_f = .14$, $p < .001$) and weakest for White students from PWEs ($b_f = .05$, $p < .001$), although no significant b coefficient differences appeared at the $p < .005$ level. Conversely, White ($b_f = -.06$, $p < .01$) and non-White students ($b_f = -.20$, $p < .001$) from PWEs who report high levels of anxiety in their precollege interactions with diverse others are likely to have lower Positive CRI in college. This result signifies that students who come to college with negative experiences in interacting with diverse others are likely to report an enduring effect through the second college year, affirming yet again the importance of accounting for precollege measures. Importantly, on this same measure, White ($r = -.09$, $p < .001$) and non-White students ($r = -.12$, $p < .001$) from PMEs report an initial negative correlation with Positive CRI, although this negative relationship is effectively weakened once the model accounts for students who are predisposed by having extensive precollege interactions with diverse peers.

The results for the last few precollege measures highlight important trends for students in PWEs. Students who frequently engage with diverse peers in study groups or in discussions on racial issues show an enhanced likelihood of increased positive diversity experiences in college, while students who report negative or anxious interactions with diverse others prior to college are likely to show decreased positive diversity experiences. In sum, the precollege experiences of students from PWEs, either White or non-White, have important influences on their college diversity experiences, which in turn have important implications for how the educational benefits of diversity can be conferred on students. The mixed results presented throughout this study indicate a truly complex portrait of the long-term effects of segregated environments on students' diversity experiences in college.

The structural diversity measure (Block III) proves to be a strong positive predictor of the outcome measure for the total sample, and the subgroup analyses show that this relationship continues to hold significantly for White students from PWEs ($b_f = .01$, $b = .07$, $p < .001$) and PMEs ($b_f = .01$, $b = .11$, $p < .001$). For the two non-White student subgroups, the measure does not remain statistically significant throughout the model. As with the prior set of subgroup regressions, rescaling the beta values into standardized regression coefficients reveals some important differences, as White students

from PWEs (B = .07) and PMEs (B = .11) exhibit significantly higher beta coefficients when compared to non-White students from PWEs (B = .00) and PMEs (B = .01).

Comparing b coefficients for structural diversity uncovers significant differences ($p < .05$) between White students from both PWEs and PMEs and the two non-White student groups ($p < .05$), although these results are offered with caution since they do not satisfy the $p < .05$ threshold. Nonetheless, these results, coupled with similar racial differences noted in the prior regression model, demonstrate that racially diverse institutional environments affect White students more prominently than non-White students on the behavioral college outcome of Positive CRI. It is especially important that students who come from the most segregated of precollege environments (e.g., White students from PWEs) are likely to benefit significantly from attending diverse institutions. These results offer additional evidence of the efficacy of diverse college environments in facilitating greater student interactions, which in turn may lead to additional educational benefits for students and institutions.

In comparing the effects of college environments (Block IV), some important subgroup trends emerge among the final b coefficients. White students from PWEs who live on campus ($b_f = -.06$, $p < .10$) are likely to report decreased Positive CRI, although this relationship is revealed as a sign reversal once the model controls for students living with diverse peers. This finding yields interesting implications for institutions, as White students from PWEs who live on campus seem inclined to report fewer positive interactions unless they live in racially diverse campus settings. Non-White students from PMEs show a similar sign reversal on this measure as a result of the model's controlling for students living with diverse peers, although the final b coefficient is not significant. These findings serve to endorse the efficacy of structuring living environments on campus in ways that maximize the racial and ethnic diversity within such settings. Students who live on campus and who live in less diverse settings are more likely to report less Positive CRI, a trend that can ultimately impede even the most meaningful diversity efforts.

A college environmental measure that positively affects Positive CRI is participating in academic support services, as three of the four subgroups report significant final b coefficients on this measure; the one exception is non-White students from PWEs. Similarly, for all four subgroups, students who report more hours per week socializing are likely to report higher Positive CRI. Among other measures in this block, one that stands out is majoring in engineering for non-White students from PWEs ($b_f = -.25$, $p < .05$). Such students are significantly more likely to report a negative effect on Positive CRI than their counterparts who do not major in engineering. This finding extends prior research on this group (Engberg, 2004; Milem, 1994) by revealing an interaction effect between race and majoring in engineer-

ing for students' interactions on campus (Engberg, 2004). Future research should consider elaborating on this point by examining these interaction and indirect effects more closely.

Moving to the college environment variables (Block V), White students from PWEs who join a Greek organization ($b_f = -.11, p < .01$) are significantly less likely to engage in Positive CRI, signifying yet another point of concern for institutions and one validated by prior research (Chang & DeAngelo, 2003). Students from these precollege settings arrive in college with the lowest levels of interactions with diverse peers, and joining a sorority or fraternity only reinforces this trend, thus resulting in fewer positive diversity experiences. On the other end, only non-White students from PWEs who live in culturally themed residences ($b_f = -.33, p < .001$) are likely to report lower Positive CRI scores, yielding a similar result (as reported in the interactions subgroup regression models). This finding suggests that college experiences work differently for non-White students who come from different precollege racial environments. In other words, each of these college environments had a suppressor effect on its respective subgroup once the model accounted for the suppressor variable: students' precollege levels of interactions with diverse peers. In short, each of these findings discloses important insights about settings that perpetuate, rather than interrupt, the ill effects of segregated environments.

The results for White students from PWEs who join Greek organizations and for non-White students from PWEs living in culturally themed residences warrant careful review. Some may be quick to charge that culturally themed residences are prime examples of the overexuberance and overreaching of affirmative action policies in higher education institutions, but they should also notice the negative effects that Greek organizations can engender for White participants from PWEs. As discussed in prior research, non-White or minority students often choose such living arrangements as a coping strategy to account for perceived hostile or unwelcoming college environments (Loo & Rolison, 1986; Tatum, 1997). In addition, due to their status as a numerical minority on most college campuses, some students may seek opportunities for cultural enrichment and support through such living arrangements (Duster, 1993; Villalpando, 2003). According to the Gurin et al. (2002) diversity framework, students tend to revert to their comfort zones during the college years, especially when faced with alienating or stressful college settings (Villalpando, 2003). White students who join Greek organizations are perhaps also seeking similar comfort zones, as such environments tend to be supportive social and academic refuges for these students. There is certainly a need for more empirical research in this area. Ultimately, it is important to consider these results within the broader context of the institutional climate for diversity rather than as stand-alone critiques of specific institutional practices. It is likely that neither of these practices (i.e., Greek

organizations and culturally themed residence) will be going away anytime soon, so it is incumbent on institutions to be proactive in addressing these trends.

Turning to diverse college experiences (Block VI), one living arrangement that yields consistent results for all four subgroups is living with people from different racial or ethnic backgrounds. The effect of this living arrangement is significantly stronger for White students from PWEs ($b_f = .35$, $p < .001$) as compared to the other three subgroups ($p < .005$), suggesting the importance of this college setting in enhancing students' positive diversity experiences in college. Similarly, the effects of participating in diverse co-curricular activities is positive for White students from PWEs ($b_f = .12$, $p < .001$) as well as for White ($b_f = .09$, $p < .001$) and non-White students ($b_f = .07$, $p < .01$) from PMEs. White students from PMEs who join an organization that promotes cultural diversity ($b_f = .21$, $p < .01$) are more likely than their counterparts who do not join such groups to report increased Positive CRI. The precollege racial environments for these students may be rich with opportunities for meaningful engagement with diverse peers, which could influence these students to participate in organizations that promise such interactions.

Also within this block of variables, non-White students from PWEs who enroll in diversity courses ($b_f = -.11$, $p < .05$) are less likely to report higher Positive CRI scores, although this peculiar relationship is revealed as a sign reversal once the model controls for students who report many opportunities for classroom engagement with diverse peers. Indeed, this measure has an initial positive correlation ($r = .11$, $p < .05$) with the outcome that is eventually explained by the model. Reporting increased opportunities for classroom engagement with diverse peers proves to be a strong positive predictor of the outcome measure for White students from PMEs ($b_f = .07$, $p < .05$) and for non-White students from PWEs ($b_f = .14$, $p < .01$). Of special note, this block of measures also shows a significant increase in the variance explained for all four subgroups, offering strong evidence of the saliency of college diversity experiences in affecting students' college behaviors.

Finally, for the attitudinal measures (Block VII) across the four subgroups, White students from PWEs ($b_f = .03$, $p < .10$) and non-White students from PMEs ($b_f = .03$, $p < .10$) who report that a faculty member has taken an interest in their development are likely to show a marginally significant Positive CRI score in college. Similarly, White students from PWEs ($b_f = .05$, $p < .001$) and PMEs ($b_f = .05$, $p < .05$) as well as non-White students from PMEs ($b_f = .07$, $p < .01$) who report a strong sense of belonging on campus are likely to show modest upward gains on Positive CRI. These findings suggest that, for students who come to college from the most segregated backgrounds (Whites from PWEs and non-Whites from PMEs), having a strong sense of belonging on campus and feeling supported by faculty are both important influences on positive diversity experiences in college. Interestingly, non-

White students from PWEs who report that they have been singled out in class ($b_f = .11$, $p < .05$) because of their race, gender, or sexuality are likely to show an increase in Positive CRI.

The subgroup regression results presented in Table 4 display important differences in how some precollege and college measures affect students on their positive cross-racial interactions. In general, the precollege interactions measure is the most important predictor of future Positive CRI. Nonetheless, other key precollege measures prove critical in shaping students' college behaviors. Similarly, various college environments and experiences interrupt the perpetuation effects of precollege factors. The findings once again affirm that college curricular and co-curricular experiences are critical in shaping students' positive cross-racial interactions. If one of the primary goals of institutions is to promote greater positive interactions among diverse peers, then the findings presented here offer relevant and empirically driven strategies that could serve both to effectively inform their efforts.

DISCUSSION AND CONCLUSION

This study's main conclusion is two-fold: (a) Students' precollege racial environments and experiences indeed have notable perpetuation effects on college diversity outcomes such as cross-racial interactions and students' attitudes about racial discrimination; (b) Nonetheless, the multivariate results unmistakably show that racially and ethnically diverse college settings, as well as students' college diversity experiences, significantly mediate or interrupt these perpetuation effects. In spite of students' segregated precollege environments and experiences, public universities that are more structurally diverse and that foster more diverse curricular and co-curricular activities can positively affect students' levels of interactions with diverse peers.

For the Positive CRI outcome, the post-hoc tests reveal important subgroup differences that reinforce the utility of disaggregating students by distinct precollege racial environments. White students from PWEs report the lowest score on positive interactions of all other subgroups. Having scored highest of all subgroups on this critical outcome measure, non-White students from PWEs seem best prepared to engage in Positive CRI, perhaps as a direct result of precollege experiences with diversity that may have exposed them to more opportunities for interacting with diverse peers. Students' precollege racial environments have varying and significant influences on their opportunities and on the nature of interactions with diverse others. In short, perpetuation effects are indeed present across each of the four subgroups, suggesting that students' precollege environment and experiences have lingering effects on their levels of interactions with diverse peers in the early college years.

Even after controlling for a variety of college measures, students' precollege experiences (e.g., precollege interactions with diverse peers, studying with diverse peers, anxieties over interacting with diverse peers) and precollege expectations (e.g., expecting to get to know diverse peers, expecting to enroll in a diversity course) continue to show significant perpetuation effects. Ultimately, the most important finding among a variety of precollege diversity experiences is their continual strong effect on students in the second year of college. This finding suggests the urgency of improving intergroup relations in college.

One of the more important findings of the regression results is the significant positive influence of the structural diversity measure on students' interactions in college. Prior research has established the importance of structural diversity in enhancing student interactions across race (e.g., Antonio, 1998; Chang, 1996; Chang, Astin, & Kim, 2004), yet the important distinction offered by this study's results is the continuing prominence of a racially and ethnically diverse college environment even after controlling for precollege measures that were not available in most prior research. Students who come from the most segregated of precollege environments (e.g., White students from PWEs) are likely to benefit significantly from attending diverse institutions. Also, students' college experiences—such as participating in diverse co-curricular activities, enrolling in diversity courses, living with diverse peers, living in culturally themed residences for White students from PWEs, or joining organizations that promote cultural diversity for White students from PMEs—do enhance students' quality of interactions with diverse peers.

These results offer important evidence for how diverse college environments can facilitate greater student interactions. They suggest that more diverse college settings offer an added benefit for students in terms of the enhanced possibility of more positive interactions with diverse peers, which in turn could lead to a variety of other educational benefits for students. This finding is a strong challenge to the belief that increased diversity leads to conflict on campus (Bloom, 1986; D'Souza, 1991; Thernstrom & Thernstrom, 1997; Rothman et al., 2003). Further, it reaffirms the important link between more diverse institutional settings and positive outcomes for students and reconfirms the continuing importance of the college environment in disrupting the cycle of segregation for students.

The compelling findings from this study represent a new discourse with which to discuss and defend institutional diversity efforts and the educational benefits that can flow from diverse contexts. Specifically, this discourse should now include a discussion of the educational benefits of racial and ethnic diversity that is rooted in diversity's capacity to interrupt and perhaps undo the pervasive perpetuation effects of increasingly segregated precollege environ-

ments. This approach represents a significant new viewpoint for discussions on diversity in higher education because it addresses a largely unexplored, yet critical, gap in the study of the educational benefits of diversity.

The findings of this study also validate and perhaps further illuminate the many languishing desegregation efforts across the country at the K-12 level, as precollege environments that are more racially and ethnically integrated show more positive effects for student diversity outcomes in the early college years. The implication for students' diversity college experiences is that they can disrupt the cycle of segregation. This conclusion is a key factor in discussions of the educational benefits of diverse college environments, a renewed perspective that may reinvigorate the ongoing debate over affirmative action in higher education.

APPENDIX A

INDEPENDENT VARIABLES: PRE-COLLEGE AND STUDENT BACKGROUND MEASURES

Items	*Scale and Range*
Block I: Background Characteristics	
Gender (female)	1-no; 2-yes
Race (4 dichotomous variables: African Am., Asian Am., Latino, & White)	1-no; 2-yes
Socio-economic Status (SES) (3-item factor)	1-some high school; 6-profes-
—Parental education (mother and father)	sional/PhD; 1-less than $10K;
—Family income	8-more than $150K
High school type (public)	1-no; 2-yes
SAT (math + verbal)	400-1600 range
Block II: Pre-College Diversity Experiences/Environments	
Pre-test: Interactions with diverse peers	1-no interaction; 4-substantial interaction
Racial composition: peer group	1-all/nearly all people of color
5-all/nearly all White	
Freq: Discussed racial/ethnic issues	1-never; 5-daily
Freq: Studied with someone from a different racial or ethnic group	1-never; 5-daily
Freq: Encountered racial discrimination in high school	1-never; 3-frequently
Freq: Encountered economic discrimination in high school	
Expect to take a course devoted to diversity issues in first year of college	1-very unlikely; 4-very likely
Expect to make efforts to get to know individuals from diverse backgrounds	1-very unlikely; 4-very likely
How often did you feel uncomfortable in a situation with a person or a group of people from diverse backgrounds?	1-never; 4-often

Note: These variables are available in the Diverse Democracy Longitudinal Dataset (Hurtado, 2003a).

APPENDIX B

INDEPENDENT VARIABLES: COLLEGE ENVIRONMENTS, EXPERIENCES, AND VIEWS

Items	*Scale and Range*
Block III: Institutional Characteristics	
Structural Diversity: Percent non-White population	% African American; % Latino; % Asian, undergrad
Block IV: College Environments/General Activities	
Lived on campus	0-no; 1-yes
Major: Engineering	0-no; 1-yes
Participated in academic support services (2-item factor scale) —participated in tutoring sessions —participated in support programs	1-never; 5 very often
Participated in leadership training	0-no; 1-yes
Hours per week working for pay	1-no hours; 6-20 or more hours
Hours per week socializing	1-no hours; 6-20 or more hours
Block V: College Experiences (segregated contexts)	
Joined a sorority or fraternity	0-no; 1-yes
Joined an organization reflecting my own cultural heritage	0-no; 1-yes
Lived in a culturally themed residence/hall/house	0-no; 1-yes
Block VI: College Experiences (curricular/co-curricular activities)	
Lived with people with cultural background different than mine	0-no; 1-yes
Joined an organization that promotes cultural diversity	0-no; 1-yes
Participated in diversity co-curricular activities (2-item factor) —Campus organized discussions on racial/ethnic issues —Diversity awareness workshops	1-never; 5 very often
Attended a class, seminar, campus panel, workshop, or information session related to September 11	0-no; 1-yes

Appendix B, Cont.

Items	*Scale and Range*
Enrolled in diversity courses (3-item factor)	
—Courses included materials/readings on issues of gender	
—Courses included materials/readings on issues of oppression	
—Courses included materials/readings on issues of race and ethnicity	1-none; 4- three or more
Opportunities for classroom engagement with diverse peers (2-items)	
—Courses where faculty created opportunities for class discussions/interactions with other students	
—Courses where faculty created opportunities for intensive dialogue between students with different backgrounds and beliefs	1-none; 4- three or more
Block VII: College Attitudes/Views	
At least one faculty member has taken an interest in my development.	1-strongly disagree; 4-strongly agree
Sense of belonging on campus (3-item factor scale)	
—I see myself as part of the university community.	
—I feel a sense of belonging to this university.	
—I feel that I am a member of the university community.	1-strongly disagree; 4-strongly agree
I have heard faculty express stereotypes about racial/ethnic groups in class.	1-strongly disagree; 4-strongly agree
I have been singled out in class because of my race/ethnicity, gender, or sexual orientation.	1-strongly disagree; 4-strongly agree
There is a lot of racial tension on the university campus.	1-strongly disagree; 4-strongly agree

Note: These variables are available in the Diverse Democracy Longitudinal Dataset (Hurtado, 2003a).

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