Objective and Subjective Measures of Diversity: How They Relate to One Another and Climate Perceptions

By Jessica Mislevy
Institutional Research, Planning, and Assessment

Abstract

The Supreme Court rulings in the "Michigan" cases recommend that institutions of higher education periodically assess both the contributions of diversity to educational outcomes and levels of diversity among campus populations. One way the University of Maryland (UM) examines the educational benefits of diversity at the institution is through student surveys. Using institutional, survey, and U.S. Census data, the current study investigates the relationship between objective and subjective measures of racial diversity in the pre-college environments of incoming freshmen. Furthermore, it explores how both objective and subjective diversity measures relate to perceptions of the climate. Results show, on average, freshmen are coming to UM from environments that are less heterogeneous than the undergraduate population. The objective diversity measure based on U.S. Census data and the subjective measure based on self-report survey data yield similar results for certain groups of respondents yet divergent results for others. Both measures of diversity, however, relate to climate perceptions similarly; individuals from more heterogeneous environments report a greater value for diversity and higher racial understanding skills. The most positive climate perceptions are reported by individuals coming from areas with no clear majority group, supporting UM's goal to maintain and increase the racial diversity on campus.

Introduction

The Supreme Court rulings in the "Michigan" cases recommend that institutions of higher education periodically assess both the contributions of diversity to educational outcomes and levels of diversity among campus populations. A series of studies prompted by this recent litigation have linked heterogeneity of experience to benefits in mental processes; exposure to individuals with varying perspectives and engaging with individuals different from oneself leads to improvements in critical thinking, moral reasoning, and cognitive development (e.g., Gurin, Dey, Hurtado, & Gurin, 2002; Hurtado, Mayhew, & Engberg, 2003; Killen, Crystal, & Rock, 2005). Racial diversity in an environment, such as a campus community, contributes to heterogeneity of perspectives. Interracial interaction helps individuals understand the world from someone else's perspective, tolerate differences, and accept one's views being challenged (Engberg, Meader, & Hurtado, 2003). Contributions of racial diversity, however, require a "critical mass" of minority individuals within an environment to allow for sufficient opportunities for interracial interaction (Hurtado, Dey, & Trevinno, 1994).

One way the University of Maryland (UM) investigates the educational benefits of diversity at the institution is through surveys of various campus populations. These surveys include items about attitudes regarding diversity, exposure to diverse others, and perceptions of the climate for diversity in one's environment. Using this survey data, the relationship between self-reported exposure to diversity and climate perceptions and outcome measures, such as self-reported racial understanding, can be examined (Ostroff, 2007). Such investigations have been carried out for incoming freshmen regarding their pre-college experiences, new freshman regarding their early college experiences, and upperclassmen regarding their later college experiences.

A limitation of these institutional surveys, however, is that they utilize self-reported diversity measures to explain climate perceptions and educational outcomes. Objective measures based on structural diversity, or numerical representation of individuals from different racial and ethnic groups of one's environment, have also been proposed (e.g., Frey & Meyers, 2002; Meyer & McIntosh, 1992; White, 1986). The availability of such measures begs questions such as, "How do subjective, or self-reported, measures of diversity relate to objective measures of structural diversity?," and "Are subjective measures or objective measures of diversity better predictors of climate perceptions and educational outcomes?"

Aims

Using institutional, survey, and U.S. Census data, the current study seeks to determine the relationship between objective and subjective measures of diversity in the pre-college environments of incoming freshmen. Furthermore, it aims to explore how both objective and subjective diversity measures relate to perceptions of the climate. Specifically, the first stage of the analysis examines descriptive results for diversity measures. The research questions are as follows:

> 1a) What kinds of pre-college environments are incoming freshmen coming from in terms of their racial/ethnic composition? Are these environments more or less diverse than the UM campus?

1b) Does the racial/ethnic heterogeneity of one's pre-college environment differ, on average, by the race/ethnicity of the individual?

1c) Are incoming freshmen coming from environments in which they belong to the racial/ethnic majority group or a minority group in the area?

The second stage of the analysis compares objective and subjective measures of diversity in one's pre-college environment. The following questions are examined:

2a) How does an objective measure of diversity based on U.S. Census data relate to a subjective measure of diversity based on self-reported exposure to diverse others?

2b) Does the form of this relationship differ for racial/ethnic majority and minority students?

Lastly, the third stage of the analysis examines the relationship between measures of diversity – both objective and subjective – and climate perceptions. The following questions are explored:

3a) How are climate perceptions related to the racial/ethnic heterogeneity of one's pre-college environment? Is an objective measure or subjective measure of diversity more strongly related to climate perceptions?

3b) Do average climate perceptions vary across racial/ethnic subgroups?

3c) Do climate perceptions in one's pre-college environment differ for those who belong to the racial/ethnic majority group in their area and those who do not?

Method

The Instrument

As part of an ongoing program of collection of longitudinal survey data, UM gathers data annually on a wide range of attitudinal, behavioral, and demographic characteristics of incoming freshmen. The University New Student Census (UNSC) survey was initially developed for that purpose by the Counseling Center. The survey provides one of the few sources of pre-enrollment information about UM entering students including their pre-college experiences, attitudes, beliefs and expectations.

Participants and Procedure

A total of 4237 first-time, full-time freshmen were invited to complete the UNSC online in the summer of 2007, prior to their matriculation. After they attended orientation, an e-mail announcing the survey was sent to incoming freshman using the account Admissions had on file. Two reminder messages were sent to individuals who had not completed the survey or opted out. Students were informed that their participation was voluntary and responses were confidential. Respondents provided identification numbers, thereby enabling access to their institutional demographic information.

Complete, usable data was available for 2432 participants. Of these, 48% were male and 53% were female. Additionally, 64% were White, 13% were Asian American, 12% were Black/African American, 6% were Hispanic, 1% was Foreign, <1% was American Indian, and 4% were of an unknown race/citizenship. The mean age was 18 (SD = .503).

Measures of Diversity

Three measures of diversity are considered in this investigation: the diversity index, a prior environment scale, and a majority/minority indicator.

Diversity Index

An index developed by Meyer and McIntosh (1992) was selected to measure the racial/ethnic variation or heterogeneity of a population. The diversity index represents the probability that two individuals, selected at random, will differ along the dimension of race/ethnicity. To calculate the diversity index, the proportion of the population represented by each racial group is first squared and then summed across subgroups; this value represents the likelihood that two people in a pool have a similar characteristic. This quantity is then subtracted from unity to determine the probability that two people randomly selected from the population will be of a different race/ethnicity.

The diversity index varies as a function of the number of categories or subgroups within a population and the proportional representation of each subgroup in the population. That is, the index is maximized when there are equal proportions of each racial subcategory within the population. Additionally, the greater the number of subpopulations, the higher the maximum value of the index.

The diversity index was calculated for two populations in which five racial/ethnic subgroups were considered (Asian, African American/Black, Hispanic, Native American, and White). Using institutional data, the first measure was created for the Fall 2007 UM undergraduate population. Using data from the U. S. Census Bureau's 2000 Census (2002), the second measure was calculated for the population in the zip code of the permanent address filed with Admissions for each of the UNSC'07 respondents. Thus, each respondent had a diversity index for his or her zip code attached to their survey responses and institutional records. Note that Foreign students and students of an unknown race/ethnicity were excluded for analyses utilizing this variable, as U.S. Census data for these racial/ethnic groups are not offered.

Prior Environment Scale

The UNSC'07 included a series of four items asking respondents about the racial/ethnic composition of their environment prior to attending UM. Specifically, they were asked to describe the racial/ethnic composition of the neighborhood where they grew up, the high school they graduated from, their friends in high school, and their friends in the neighborhood where they grew up. Respondents were asked to rate their prior environments using a five-point scale (1 = *all or nearly all people of color*, 5 = *all or nearly all white*). Instructions indicated that people of color include African Americans, Hispanics, Asian Americans and American Indians. Responses were averaged across the four items to form a prior environment scale ($\alpha = .864$).

Higher scale scores indicate one's pre-college environment consisted primarily of White individuals.

Majority/Minority Indicator

Using the U.S. Census data and institutional data, a variable was created to identify respondents as belonging to the racial/ethnic majority group in their zip code, belonging to a racial/ethnic minority group in their zip code, or coming from an area with no overwhelming majority group. For this analysis, zip codes were identified as having a racial/ethnic majority group if one of the subgroups represented 65% or more of the population. Zip codes in which no racial/ethnic group made up at least 65% of the population were considered to have no majority group. Foreign students and students of an unknown race/ethnicity were again excluded for analyses utilizing this variable, as U.S. Census data for these racial/ethnic groups are not offered.

A 65% threshold was selected for this analysis based on literature addressing the phenomenon of a "critical mass." Researchers posit that a "critical mass" of individuals from a minority group influences the number of opportunities for interracial interaction, discussion of race issues, and interracial friendships, and limits the incidence of "tokenism" (Chang, 1996; Hurtado, Dey, & Trevinno, 1994; Kanter, 1977; Springer, 1995). Expressed as a percentage of minorities, Kanter (1977) suggested a threshold of critical mass of about 35% based on her work in small group dynamics. Therefore, zip codes in which minority groups represented over 35% of the population were assumed to meet the criteria for a "critical mass," and were considered to have no overwhelming majority group.

Across the 32,125 unique zip code tabulation areas included in the U.S. Census, 83% have a White majority, 2% have a Black majority, 2% have a Hispanic majority, 1% have a Native American majority, <1% have an Asian majority, and 12% have no racial ethnic majority group according to the criterion described above.

Climate Measures

Three measures of climate perceptions are considered in this investigation: value of diversity, tolerance for discrimination, and racial understanding. See the Appendix for a complete list of survey items and associated response scales used to develop these climate measures.

Value of Diversity

The UNSC'07 included a series of six items measuring perceptions of the extent to which respondents' high schools valued and promoted diversity. A sample item was "The different perspectives that students from diverse backgrounds bring to my high school were valued." Respondents were asked to rate their pre-college environments using a five-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Responses were averaged across the six items to form a value of diversity scale ($\alpha = .828$). Higher scale scores are associated with more positive perceptions of the climate.

Tolerance for Discrimination

The UNSC'07 included a series of three items measuring perceptions of the extent to which discrimination existed and was tolerated in the respondents' high schools. A sample item was "My high school did not tolerate discrimination." Respondents were asked to rate their prior environments using a five-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Negatively-worded items were reverse coded and responses were averaged across the three items to form a tolerance for scale (α = .778). Higher scale scores are associated with less perceived discrimination, or more positive perceptions of the climate.

Racial Understanding

The UNSC'07 included a series of five items measuring respondents' learning about different cultural backgrounds and interactions with others from different backgrounds. A sample item was "In my high school, I was able to gain a better understanding and appreciation of other cultures." Respondents were asked to rate their learning and interactions using a five-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Responses were averaged across the five items to form a racial understanding scale (α = .800). Higher scale scores are associated with greater self-reported racial understanding.

Results

Descriptive Results for the Diversity Measures

Diversity Index

Table 1 displays the average diversity index for the UNSC'07 respondents' zip code by race/ethnicity and overall. Note, Foreign respondents and respondents of an unknown race/ethnicity have been excluded from the analysis.

Table 1.

Respondent Race/Ethnicity	**N**	**Diversity Index** Mean (SD)
American Indian	4	.32 (.232)
Black/African American	296	.43 (.168)
Asian	308	.43 (.166)
Hispanic	143	.45 (.183)
White	1520	.29 (.179)
Total	**2271**	**.34 (.189)**

Overall, the average diversity index associated with the zip codes of UNSC'07 respondents is .34. White respondents tend to come from more homogenous areas, with an average diversity

index of .29. In contrast, Black/African American, Asian, and Hispanic respondents, on average, come from zip codes with indices above .40. In other words, the ethnic minority students come from more racially heterogeneous areas than the White respondents. In fact, a comparison of means across racial groups indicated that the average diversity index for White respondents is statistically significantly lower than that of Black/African American, Asian, and Hispanic respondents ($p < .05$)

The diversity index for the UM undergraduate population in the Fall of 2007 was .55. These results indicate that, selecting two undergraduates at random, there is about an even chance that they would not be of the same race/ethnicity. The diversity index of the undergraduate population is higher than the average value for the zip codes of the UNSC'07 respondents (.55 vs. .34, respectively). Furthermore, the UM diversity index is greater than the average diversity index for any of the racial/ethnic subgroups. Thus, on average, UM contains more racial heterogeneity than that found in the incoming freshmen's prior environments.

Prior Environment Scale

Table 2 displays the average self-reported prior diversity of one's pre-college environment for the UNSC'07 respondents by race/ethnicity and overall. Note, Foreign respondents and respondents of an unknown race/ethnicity have been excluded from the analysis.

Table 2.

Respondent Race/Ethnicity	**N**	**Prior Environment Scale** Mean (SD)
American Indian	3	3.83 (.764)
Black/African American	241	2.64 (.890)
Asian	268	3.17 (.769)
Hispanic	115	3.13 (1.005)
White	1306	4.07 (.670)
Total	**1933**	**3.71 (.914)**

A mean score of 3.71 on the prior environment scale indicates respondents tend to report coming from environments consisting of more White individuals than people of color. This finding is particularly true for the White respondents, as the prior environment scale mean for this racial/ethnic group is 4.07. Asian and Hispanic respondents tend to report approximately equal exposure to Whites and people of color, with scale means equal to 3.17 and 3.13, respectively. The scale mean for the Black/African American respondents is the only subgroup mean below 3, or the response scale midpoint; thus, on average, these individuals report being exposed to slightly more people of color than White individuals in their pre-college environment.

A comparison of means on the prior environment scale revealed significant differences across racial/ethnic groups ($p < .05$). Post hoc tests show that the scale mean for Black/African

American respondents is statistically significantly lower than those of Asian, Hispanic, and White respondents. Furthermore, the scale means for both Asian respondents and Hispanic respondents are significantly lower than that of White respondents. These results are fairly consistent with the comparison of diversity indices across racial/ethnic groups, in that White respondents come from significantly less heterogeneous areas and report less exposure to people of color than their minority counterparts. The comparisons on this subjective measure of diversity also revealed differences in reported exposure across minority groups, a result not obtained in the comparisons on the objective measure. That is, there are statistically significant mean differences among racial/ethnic minority groups in self-reported exposure to diversity but not the diversity index.

Majority/Minority Indicator

Table 3 below displays the results of the analysis based on the majority/minority indicator. Note, a 65% threshold was used to determine if a zip code had a racial/ethnic majority group. Results are displayed by the race/ethnicity of respondents and for the group as a whole. Again, Foreign respondents and respondents of an unknown race/ethnicity were excluded.

Table 3.

Respondent Race/Ethnicity	**N**	**Racial/Ethnic Majority in Permanent Address Zip Code** Row Percents				
		No Majority	**White Majority**	**Asian Majority**	**Black Majority**	**Hispanic Majority**
American Indian	4	25	50	0	25	0
Black/African American	296	40	36	0	24	0
Asian	308	40	59	0	1	0
Hispanic	143	41	54	0	4	1
White	1520	15	84	0	1	<1
Total	**2271**	**23**	**72**	**0**	**4**	**<1**

Overall, nearly three-quarters of respondents (72%) come to UM from zip codes with a White majority. Just under a fourth (23%) come from zip codes with no overwhelming majority group, and few students come from zip codes with a Black majority or Hispanic majority (4% and <1%, respectively). No respondents (0%) come from zip codes with an Asian majority; this result is not too surprising considering less than 1% of U.S. zip codes are comprised of 65% or more Asian citizens.

Most White respondents (84%) come from zip codes with a White majority. Respondents from racial/ethnic minority groups tend to be almost evenly split across zip codes with a White majority or no overwhelming majority group. Unlike Asian and Hispanic respondents, however,

almost a quarter (24%) of Black/African American respondents have permanent addresses in zip codes where their race/ethnicity matches that of the majority group.

Overall, 59% of respondents across racial/ethnic groups come from zip codes in which their group forms the majority. Nearly a quarter of respondents overall (23%) come from zip codes with no majority group. Just under one fifth (17%) of respondents come from a zip code in which their own race/ethnicity does not match that of the majority group.

Comparison of Objective and Subjective Diversity Measures

Relationship between Diversity Index and Prior Environment Scale

The next analysis examined the relationship between the diversity index of the respondents' zip code and self-reported diversity of one's prior environment. In other words, it examined the relationship between an objective measure of diversity and a subjective measure. Figure 1 shows a scatter plot of the respondents' diversity indices against their self-reported prior exposure to diversity.

Figure 1.

As depicted by Figure 1, the relationship between the two variables considered in this analysis is not perfectly linear, nor was it expected to be. Due to the response options accompanying the survey items, respondents at both the high end and low end of the prior environment scale may have been exposed to relatively homogenous racial groups. That is, respondents with scale scores close to 5 report their prior environment consisted of primarily White individuals and respondents with scale scores close to 1 report their prior environment consisted primarily of people of color. Environments consisting of mostly people of color may be comprised of

individuals from the same racial/ethnic minority group or they could consist of people of color from several different racial/ethnic minority groups.

The heaviest concentration of observations in Figure 1 is in the top left quadrant. Respondents indicating that their prior environment primarily consisted of White individuals also tend to have a lower diversity index associated with the zip code of their permanent residence. Observations in the bottom right quadrant are likely representing respondents from heterogeneous zip codes in which the people of color are from several different racial/ethnic minority groups. In contrast, observations in the bottom left quadrant are likely representing respondents from homogenous zip codes in which the people of color they report interacting with are from the same racial/ethnic minority group. Finally, observations in the top right quadrant represent respondents coming from diverse environments but indicating they interact with primarily White individuals. This apparent disconnect between the objective and subjective measure of diversity could be explained by perceptions that one's environment is more White than it actually is, or that one elects to interact primarily with White individuals (note, the prior environment scale included items asking about the composition of the respondent's group of high school and neighborhood friends).

Descriptions of the four quadrants can be roughly summarized using Figure 2. To reiterate, the description of the environment is based on the objective diversity index, whereas the description of interaction is based on subjective self-report data.

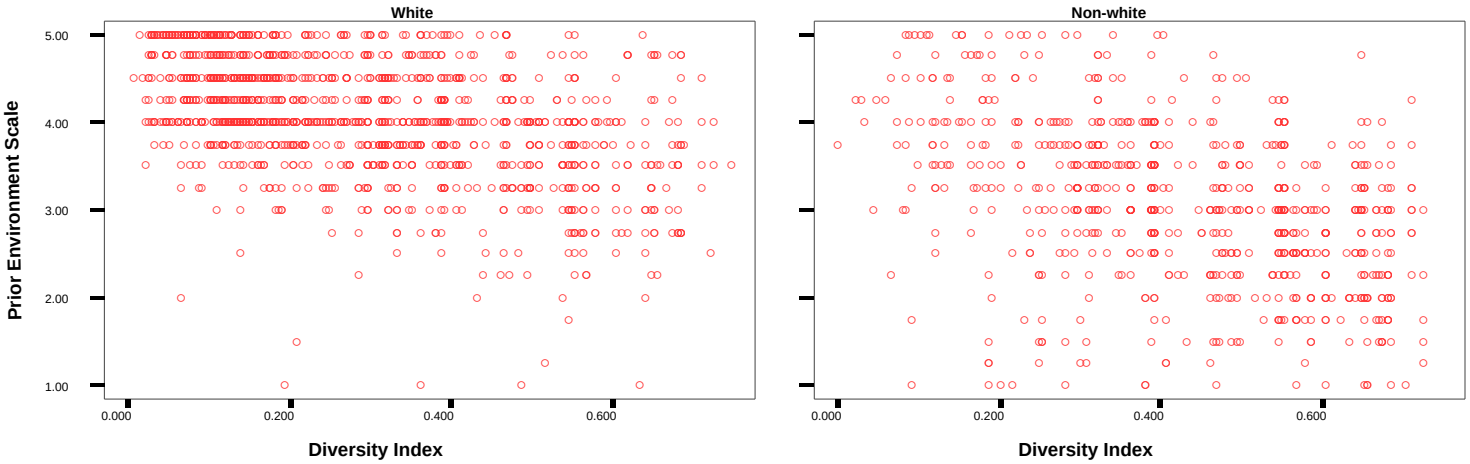
Figure 2.

Homogenous environment **Mostly white interaction**	**Heterogeneous environment** **Mostly white interaction**
Homogeneous environment **Mostly single-group, non-white interaction**	**Heterogeneous environment** **Mostly multiple-group, non-white interaction**

Form of Relationship by Race/Ethnicity

For this analysis, Figure 1 was recreated separately for White and non-white respondents. This was done in order to determine whether the relationship between the diversity of one's pre-college environment and interaction with diverse others differs by race/ethnicity. See Figure 3.

Figure 3.



As depicted in Figure 3, the concentration of observations across the four quadrants differs for White respondents and non-white respondents. The vast majority of White respondents fall in the top left quadrant; that is, they come from relatively homogenous areas and report interacting primarily with other white individuals. Additionally, even those respondents in the top right quadrant who come from heterogeneous areas reporting interacting with primarily white individuals. In contrast, non-white respondents are more evenly spread across the four quadrants, with somewhat of a concentration in the bottom right quadrant; that is, non-white respondents tend to come from more heterogeneous areas and interact more with people of color than their White counterparts.

Relationship between Measures of Diversity and Climate Perceptions

Climate Perceptions with Diversity Measures

Table 4 below displays the bivariate correlations between the two diversity measures and the three climate perception measures.

Table 4.

	Correlation		
	Value of Diversity	**Tolerance for Discrimination**	**Racial Understanding**
Diversity Index	.176*	.018	.294*
Prior Environment	-.176*	-.003	-.338*

* Correlation is significant at the .05 level

Roughly speaking, these results indicate the diversity index and the prior environment scale are equally related (or non-related) to the three climate measures. These results do not show a relationship between perceived tolerance for discrimination and the diversity of one's pre-college environment as measured by the diversity index or the prior environment scale. Both diversity measures, however, are related to perceptions regarding the value of diversity and racial understanding.

The diversity index is positively correlated with the value for diversity scale, indicating that as the environment becomes more heterogeneous, so does the perceived value for diversity. A similar relationship emerges between the prior environment scale and the value for diversity scale. The negative correlation indicates that, as the environment consists more heavily of White individuals, the perceived value of diversity decreases. Put differently, as the environment consists more heavily of people of color, the perceived value of diversity increases.

Similar correlations, although even larger in magnitude, are observed between the diversity measures and the racial understanding scale. The diversity index is positively correlated with the racial understanding scale, indicating that as the environment becomes more heterogeneous, self-reported racial understanding increases. The negative correlation between the prior environment scale and racial understanding scale indicates that, as the environment consists more heavily of White individuals, perceived racial understanding decreases.

Climate Perceptions by Race/Ethnicity

The first analysis examines self-reported climate perceptions of respondents by race/ethnicity and overall. See Table 5. Note, Foreign Respondents and respondents of an unknown race/ethnicity have been excluded from the analysis.

Table 5.

Respondent Race/Ethnicity	N*	Scale Mean (SD)		
		Value of Diversity	Tolerance for Discrimination	Racial Understanding
American Indian	4	4.00 (.624)	4.17 (.962)	3.95 (.619)
Black/African American	299	3.74 (.749)	3.89 (.850)	3.87 (.668)
Asian	311	3.85 (.701)	3.72 (.799)	3.85 (.669)
Hispanic	144	3.81 (.720)	3.72 (.921)	3.81 (.751)
White	1546	3.75 (.648)	3.92 (.804)	3.65 (.735)
Total	**2304**	**3.77 (.674)**	**3.87 (.820)**	**3.72 (.724)**

* Total subgroup N's are reported, although the N's for each scale vary slightly from the total

A comparison of means did not reveal any significant differences in perceptions of the value for diversity across the racial/ethnic subgroups ($p > .05$). That is, average perceptions of the value

of diversity in one's pre-college environment are quite stable across the various subgroups. Significant differences did emerge, however, for the other two climate measures ($p < .05$). For the discrimination scale, Asian respondents reported significantly less positive perceptions on average than White respondents. Although the mean for the Hispanic respondents also appears lower than the mean of the White respondents, the difference is not statistically significant, perhaps due in part to the Hispanic subgroup's smaller size. For the racial understanding scale, a series of post hoc comparisons reveal Black and Asian respondents report significantly higher skills, on average, than White respondents.

Climate Perceptions by Majority/Minority Indicator

The last analysis considers differences in climate perceptions based on whether the respondent belongs to the racial/ethnic majority group in their pre-college zip code, does not belong to the majority group, or comes from an area without a majority group. See Table 6.

Table 6.

Majority/Minority Indicator for Respondent	N*	Scale Mean (SD)		
		Value of Diversity	Tolerance for Discrimination	Racial Understanding
No majority group	530	3.92 (.680)	3.89 (.814)	3.97 (.681)
Belongs to majority group	1345	3.73 (.645)	3.92 (.792)	3.61 (.721)
Does not belong to majority group	396	3.69 (.737)	3.69 (.889)	3.76 (.710)
Total	**2271**	**3.77 (.675)**	**3.87 (.819)**	**3.72 (.726)**

* Total subgroup N's are reported, although the N's for each scale vary slightly from the total

For the value of diversity scale, respondents coming from areas without a clear racial/ethnic majority group report the most positive climate perceptions (3.92). Respondents coming from areas in which they do not belong to the majority group report the least value for diversity (3.69). A comparison of means reveals the average self-reported value of diversity of respondents coming from areas with no majority group is statistically significantly higher than that of the other two groups ($p < .05$).

For the tolerance for discrimination scale, respondents who belong to the majority racial/ethnic group report most positive climate perceptions, or least perceived discrimination (3.92). In contrast, respondents coming from areas in which they do not belong to the majority group report the least positive climate perceptions, or most perceived tolerance for discrimination (3.69). A comparison of means reveals the climate perceptions of respondents coming from areas in which they are minorities are significantly lower than those of the other two groups ($p < .05$).

Lastly, for the racial understanding scale, respondents coming from areas without a majority group report the highest skills (3.97), followed by respondents who belong to a minority group in their area (3.76), and lastly respondents who belong to the majority group in their area (3.61). A comparison of means reveals the scale average for the no majority group is statistically

significantly higher than that of the other two groups, and that the scale average for respondents belonging to an area minority group is higher than that of respondents belonging to the area's majority group ($p < .05$).

Discussion and Recommendations

The current investigation has produced results in support of UM's goal to maintain and increase the racial/ethnic diversity of the institution. On average, UM contains more racial heterogeneity than that found in the incoming freshmen's pre-college environments. Given the contributions of heterogeneity of stimuli, UM can offer an environment that is more diverse – and thus more conducive to the development of critical complex thinking skills – than that from which its students originate. Furthermore, the UM diversity index is greater than the average diversity index for any of the racial/ethnic subgroups. This suggests that, regardless of their race/ethnicity, students are benefiting from an increase in diversity by coming to UM.

The moderate correlations between measures of diversity and climate measures also suggest the importance of structural diversity to a college campus. That is, being in a heterogeneous environment and interacting with diverse others increases the value for diversity and self-reported racial understanding skills. Results also showed the highest reported value for diversity and racial understanding are obtained from respondents living in areas with no clear racial/ethnic majority group. This group achieves greater benefits in terms of these climate measures than individuals living in areas dominated by a single race, regardless of their own race or the particular race representing the majority in the area. These results suggest UM can best foster a value for diversity and increase racial understanding skills if the institution maintains at least a "critical mass" of minority students.

The current investigation has also helped to shed light on the usefulness of objective and subjective measures of diversity. It was shown that the relationship between the two measures is not perfectly linear; the measure based on U.S. Census data and the measure based on self-report survey data yield similar results for certain groups of respondents yet divergent results for others. The two measures tended to agree for respondents in the top left quadrant of Figure 1. Those individuals came from homogeneous environments and interacted with mostly White individuals. The same was true for respondents in the bottom right quadrant coming from heterogeneous environments and interacting with mostly people of color from various racial/ethnic groups.

The objective and subjective measures do not yield the same conclusions, however, for respondents in the remaining two quadrants. That is, for respondents in the bottom left quadrant, the subjective measure suggests individuals come from heterogeneous environments because they report interacting with mostly people of color. The low diversity indices for these individuals, however, show they are actually coming from relatively homogenous areas. For respondents in the top right quadrant, the objective measure indicates they come from heterogeneous environments with high diversity indices. The subjective measure, however, indicates they still interact primarily with White individuals, despite the structural diversity of their environment.

The fact that the two diversity measures do not produce similar results for all respondents suggests the importance of considering both measures in future research. Self-reported diversity,

as currently measured by the prior environment scale, is not a perfect proxy for structural diversity. Furthermore, the assumption that one is exposed to and interacts with diverse others because they come from a structurally diverse area is not always appropriate. Future iterations of the survey could include an item asking about the racial/ethnic majority in the area to better align the subjective measures with the diversity index. Such a measure could help tease apart the racial heterogeneity of environments consisting of mostly people of color (i.e., if there is one group or multiple groups).

Lastly, there were several surprising or unanticipated findings in the current investigation. Neither the diversity index nor the prior environment scale was significantly correlated with the tolerance for discrimination scale, while both measures of diversity were significantly correlated with the other two climate measures. This result prompted a closer examination of the items included in the scale and raised questions regarding their dimensionality. It appears the items could be addressing two distinct aspects of discrimination in one's pre-college environment: existence of discrimination and reactions to discriminatory acts. That is, tolerance for discrimination may be low because discriminatory acts do not occur or because discrimination is prevalent but offenders are severely reprimanded. Future surveys should include questions designed to measure both aspects and the dimensionality of the expanded item set should be explored.

Another unanticipated finding related to the average perceptions of tolerance for discrimination across racial/ethnic subgroups. The scale means for Asian and Hispanic respondents were notably lower than that of White respondents. The scale mean of Black respondents was only slightly lower than that of White respondents, a surprising finding given the documented persistence of discrimination in the life experiences of middle and upper income Blacks (Cose, 1993; Feagin, 1991; Feagin & Sikes, 1994). A possible explanation for this result is that the least positive climate perceptions were reported by respondents who were of a different race/ethnicity that the majority of individuals in the area. Less than half of the Black respondents actually belong to a minority group in their pre-college area; a notable proportion came from areas with no clear majority group, or even from an area in which Black individuals formed the majority group. The same is not true of Asian and Hispanic respondents; more than half the respondents in these two subgroups came from areas in which their race/ethnicity did not match that of the majority group. Regardless, the particularly negative climate perceptions of Asian respondents should be investigated further, as their perceptions were the only ones statistically significantly lower than White respondents.

Acknowledgements

The author wishes to thank Kyland Howard, Senior Research and Policy Analyst in Institutional Research, Planning, and Assessment for his work with the U.S. Census dataset and diversity index, as well as feedback on the analysis plan and an earlier version of this paper.

References

Chang, M. J. (1996). *Racial diversity in higher education: Does a racially mixed student population affect educational outcomes?* Unpublished doctoral dissertation, University of California, Los Angeles.

Cose, E. (1993) *The rage of a privileged class*. New York: Harper-Collins.

Engberg, M. E., Meader, E. W. & Hurtado, S. (2003, April) *Developing a Pluralistic Orientation: A Comparison of Ethnic Minority and White College Students*. Unpublished paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Feagin, J. R. (1991). The Continuing Significance of Race: Antiblack Discrimination in Public Places. *American Sociological Review*, 56, 101-116.

Feagin, J. R., Sikes, M. P. (1994) *Living with racism*. Boston, MA: Beacon

Frey, W.H. and D. Myers. 2002. *"Neighborhood Segregation in Single-Race and Multirace America: A Census 2000 Study in Cities and Metropolitan Areas."* Working paper. Fannie Mae Foundation, Washington, DC.

Gurin, P., Dey, E. L., Hurtado, S., Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. *Harvard Educational Review*, *72(3)*, 330-367.

Hurtado, S., Mayhew, J. M., Engberg, M. (2003, November). *Diversity in the Classroom and Students' Moral Reasoning*. Paper presented at the Association for the Study of Higher Education, Portland, OR.

Hurtado, S., Dey, E. L., & Trevinno J.G. (1994, April). *Exclusion or self-segregation? Interaction across racial/ethnic groups on campus*. American Educational Research Association. New Orleans, LA.

Kanter, R. M. (1977). Some effects of proportions on group life: Skewed sex ratios and responses to token women. *American Journal of Sociology*, *82* (5), 965-990.

Killen, M., Crystal, D., & Ruck, M. (2005) The social developmental benefits of heterogeneous school environments. In Frankenberg, E., & Orfield, G. (ed.), *Can we make a rainbow?: from segregation to integration*. Charlottesville, VA: University of Virginia Press.

Meyer, P., McIntosh, S. (1992) The USA Today Index of Ethnic Diversity. *International Journal of Public Opinion Research*, Spring, 56.

Ostroff, C. (2007). *Diversity climate and its relationship to student outcomes.* Prepared for the Office of Institutional Research and Planning, University of Maryland.

Springer, L. (1995, April). *Do white students perceive racism toward minority students on predominantly white campuses?* Presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

U.S. Census Bureau. (2002) Census 2000 Zip Code Tabulation Area data using American Factfinder. Available at: http://factfinder.census.gov. Accessed December 2, 2008.

White, M. J. (1986). Segregation and Diversity Measures in Population Distribution, *Population Index*, 52, 198–221.

Appendix

Prior Environment Scale Items

1	2	3	4	5
All or nearly all people of color	Mostly people of color	Half white and half people of color	Mostly white	All or nearly all white

How would you compare the racial/ethnic composition of the following: (People of color include African Americans, Hispanics, Asian Americans and American Indians)

Neighborhood where you grew up
High School that you graduated from
Your friends in high school
Your friends in the neighborhood where you grew up

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Value of Diversity Scale Items

The different perspectives that students from diverse backgrounds bring to my high school were valued.
Students were treated fairly in my high school regardless of their racial/ethnic background.
My high school fostered respect for cultural differences.
Students were encouraged to discuss a range of ideas and to explore diverse perspectives in their courses in my high school.
My high school made a special effort to help racial and ethnic minority students feel like they "belong" there.
My high school actively promoted appreciation for diversity through clubs and school wide events.

Tolerance for Discrimination Scale Items

There was a lot of racial conflict in my high school. (R)
Discrimination was a problem in my high school. (R)
My high school did not tolerate discrimination.

Racial Understanding Scale Items

In my high school, I was able to learn about different cultures.
In my high school, I was able to gain a better understanding and appreciation of other cultures.
In my high school, I was able to engage in discussions that bring in multiple perspectives.
In my high school, I was challenged to critically examine my own beliefs regarding race and ethnicity.
In my high school, I interacted with students from racial or ethnic backgrounds different from my own.