

Minority Stress and College Persistence Attitudes Among African American, Asian American, and Latino Students: Perception of University Environment as a Mediator

Meifen Wei, Tsun-Yao Ku, and Kelly Yu-Hsin Liao
Iowa State University

We examined whether perception of university environment mediated the association between minority status stress and college persistence attitudes after controlling for perceived general stress. Participants were 160 Asian American, African American, and Latino students who attended a predominantly White university. Results of a path model analysis showed that university environment was a significant mediator for the association between minority status stress and college persistence attitudes. Additionally, minority status stress was distinct from perceived general stress. Finally, the results from a multiple-group comparison indicated that the magnitude of the mediation effect was invariant across Asian American, African American, and Latino college students, thus supporting the generalizability of the mediation model.

Keywords: African American, Asian American, and Latino students; minority stress; perception of university environment; college persistence attitudes; predominantly White university

Even though most students find college or university life to be somewhat challenging, minority students experience additional stress because of their minority status. *Minority stress* refers to the unique stresses experienced by minority students that interfere with their college adjustment and integration into the university community (Smedley, Myers, & Harrell, 1993). For many minority students, entering college may be their first exposure to being a minority in a predominantly White environment (Alvarez, Blume, Cervantes, & Thomas, 2009). Indeed, there are often very few minority students in the classroom, and they may feel pressured to speak for their entire group (Maramba, 2008). The presence of few minority faculty members may limit opportunities for ethnic minority students to find faculty mentors or role models from their own group. Many ethnic minority students are often the first in their family to attend college (Zalaquett, 1999). Therefore, they may experience additional stress from striving to achieve academically and learning how to navigate a White academic culture (Lippincott & German, 2007). Moreover, minority students often experience stress because of their invisibility on and off campus, racial tension (Sue, Bucceri, Lin, Nadal, & Torino, 2007), racial segregation during in-class study groups, nonverbal racist actions (Solórzano, Ceja, & Yosso, 2000), being assumed to have no academic concerns because of the model minority myth (Maramba, 2008), low faculty expectations for them because of the

stereotype of low intelligence (Ancis, Sedlacek, & Mohr, 2000), peers' beliefs that their admissions were due to a racial quota, and the constant pressure from the need to prove that they can succeed in school.

When ethnic minority students experience such minority stress, they are likely to feel discouraged about staying in college. For example, being the only ethnic minority student in a class can isolate minority students on campus, and they may ultimately decide to leave college (L. Brown & Robinson-Kurpius, 1997). Constantly being perceived as inferior or low in intelligence is likely to result in minority students dropping out of college (Arbona & Nora, 2007). At a predominantly White college, a study showed that ethnic minority students were more likely than White students to experience discrimination and prejudice and that these perceptions affected adjustment to college and academic performance (Nora & Cabrera, 1996). Among African American students, minority stress was associated with low academic persistence (Neblett, Philip, Cogburn, & Sellers, 2006) and low graduation rates (A. R. Brown, Morning, & Watkins, 2005). In addition, Fry (2004) found that many Latino students did not complete college as a result of the discrimination they experienced at school. In a similar vein, Asian American students often cannot find mentors from their own ethnic group to dissuade them from leaving college (Okamura & Agbayani, 1997). From the literature reviewed here, minority stress appears likely to be negatively related to college persistence attitudes among minority students.

Meifen Wei and Kelly Yu-Hsin Liao, Department of Psychology, Iowa State University; Tsun-Yao Ku, Psychology in Education Research Lab, Department of Curriculum and Instruction, Iowa State University.

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Correspondence concerning this article should be addressed to Meifen Wei, Department of Psychology, W112 Lagomarcino Hall, Iowa State University, Ames, IA 50011-3180. E-mail: wei@iastate.edu

University Environment Mediating Minority Stress and College Persistence Attitudes

In the persistence literature, Tinto's (1993) integration theory is among the most widely cited on college students' persistence in school. Tinto proposed that persistence increases when students

are integrated into a college's academic community (e.g., good academic performance) and social community (e.g., students' interaction with college peers and faculty members). However, the applicability of Tinto's model to students from diverse backgrounds has been criticized by several scholars (e.g., Castillo et al., 2006). One criticism is that his model does not acknowledge that college persistence is complicated by a racially tense university environment for diverse students (Hurtado & Carter, 1997), who often experience stress related to minority status and tension created by interacting with others. Another criticism is that his model excluded environmental factors as central constructs in the persistence process (e.g., Castillo et al., 2006). Recently, Castillo et al. (2006) added a contextual environmental factor (i.e., perception of university environment) to Tinto's model of college persistence. In a sample of Latino students, they found that a positive perception of the university environment was positively related to college persistence attitudes and was a mediator between ethnic identity and college persistence attitudes. In this study, we planned to extend Castillo et al.'s (2006) study to examine whether the perception of university environment was a mediator between minority stress and persistence attitudes (see Figure 1).

When minority students experience minority stress, they are likely to perceive the university environment negatively. Studies have consistently found that compared with White students, ethnic minority students were more likely to view predominantly White campuses as hostile, unwelcoming, socially isolating (Ancis et al., 2000), and unresponsive to their needs and interests. Minority stress may generate feelings of alienation among Latino students (Oliver, Theony, & Mickelson, 1985). In predominantly White universities, positive diverse peer interactions and a sense of community have been found to be the strongest predictors of a positive campus racial climate among African American and Asian American students (Park, 2009). "Negative faculty attitudes, even if covertly expressed and communicated, may become evident to students and lead to perceptions of a less than welcoming training environment" (Rogers & Molina, 2006, p. 144). Thus, it seems clear that when students experience minority-stress-related factors, they are likely to have a negative perception of the university environment (see Path a in Figure 1).

For minority students, a positive university environment is central to their persistence in college (Bennett, 1995), particularly among those attending predominantly White institutions

(Hurtado & Ponjuan, 2005). When the university environment is perceived as unwelcoming, discouraging, or discriminating, it can give rise to students' failure in academic work and low persistence in staying at a university (Hurtado, Milem, Clayton-Pedersen, & Allen, 1999). The culture of a predominantly White university tends to promote values, norms, beliefs, and behaviors associated with White American culture (Castillo, Conoley, & Brossart, 2004). This type of university culture may be disadvantageous for minority students with different cultural heritages by hindering their adjustment to the university and decreasing their college persistence (Castillo et al., 2006). Research has consistently found that a positive perception of the university environment predicted college persistence attitudes across different ethnic minority students (for African Americans, see Gloria, Robinson-Kurpius, Hamilton, & Willson, 1999; for Asian Americans, see Gloria & Ho, 2003; for Latino students, see Castillo et al., 2006; Fry, 2004; Gloria, 1997; Gloria, Castellanos, Lopez, & Rosales, 2005; Gloria & Robinson-Kurpius, 1996). Therefore, we expected that a positive perception of the university environment would be positively related to college persistence (see Path b in Figure 1).

From the literature cited earlier and empirical evidence, we reasoned that those who experience minority stress would have a negative perception of university environment (e.g., Park, 2009; Path a in Figure 1). Also, we expected those who perceive the university environment negatively to have low college persistence attitudes (e.g., Gloria et al., 2005; Path b in Figure 1). Thus, we expected that the association between minority stress and college persistence attitudes would be fully mediated through the perception of university environment (see Figure 1). Additionally, minority stress, experienced by minorities, should be distinguished from general stress, which is experienced by everyone (Harrell, 2000; Smedley et al., 1993). Empirically, after controlling for general stress or negative life events, minority-related stress still significantly predicted depression among Asian American students (Wei, Heppner, Ku, & Liao, 2010) and psychological distress among African American (Pieterse & Carter, 2007) and Latino college students (Saldana, 1994). To investigate the unique contribution of minority stress to perception of university environment and college persistence, we controlled for the impact of general stress on college persistence (see Paths c and d in Figure 1). We

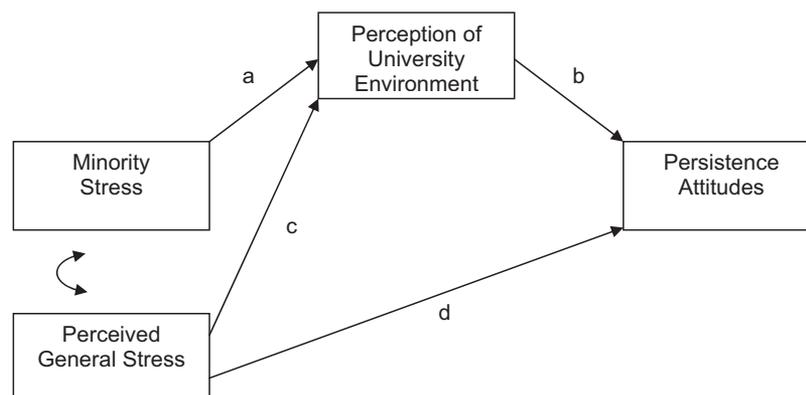


Figure 1. The hypothetical model.

hypothesized that the full mediation hypothesis would still hold after controlling for general stress (see Figure 1).

Inclusion of Three Ethnic Minority Groups

In this study, we examined the proposed mediation model (see Figure 1) among three ethnic groups (i.e., African American, Asian American, and Latino students) for two main reasons. First, these groups of students struggle with college persistence, but not all three groups have received equal research attention. In general, African American and Latino students received more attention in the college persistence research because a lower percentage of these students hold a bachelor's degree compared with their White peers (American Council on Education, 2007). Much less research has focused on Asian American students' persistence because of the model minority myth (Gloria & Ho, 2003; Yeh, 2004). Unfortunately, this stereotype obscures the reality faced by Asian Americans who "can [or] do not achieve model minority success" (Lee, 1996, p. 125). Filipinos, Pacific Islanders, and Southeast Asians have much lower levels of educational achievement in comparison to their Chinese, Japanese, and Korean counterparts (Wong, Lai, Nagasawa, & Lin, 1998). Bennett and Okinaka (1990) also found that Asian Americans reported a negative campus life and feelings of social alienation and dissatisfaction in college. As such, all three groups deserve investigation in this study.

Second, minority students from these three groups are likely to share both common and unique experiences in college. If each group was examined in a separate study, it would be difficult to discern whether the differences found across groups was the result of ethnic group or the use of different measures. Including all three groups can also increase the generalizability of the results to all three groups. Moreover, Museus, Nichols, and Lambert (2008) found that how satisfaction of campus racial climates affects persistence and degree completion varied among different ethnic minority groups. Therefore, comparing whether the associations among studied variables are invariant or variant across ethnic minority groups is critical. Invariance among the variables would increase confidence in the generalizability of the results. If invariance is not found, awareness of the differences across different ethnic groups would be needed. In this study, we planned to first examine the hypothesized mediation model (see Figure 1) with the whole sample and then examine whether the strength of the structural paths was invariant across the three ethnic groups.

Method

Participants

A total of 160 minority students (54 Asian Americans, 53 African Americans, and 53 Latino students) from a predominantly White university (more than 90% of students are White) participated in this study. Participants consisted of 74 (46%) male students and 86 (54%) female students with a mean age of 19.13 years ($SD = 2.05$, range = 18–39). One half were freshmen (55%), followed by sophomores (29%), juniors (10%), and seniors (6%). They were from different academic majors, such as liberal arts and

sciences (39%), business (16%), human sciences (15%), design (11%), engineering (9%), veterinary medicine (4%), and agriculture and life sciences (3%) (5[3%] persons had missing data). Almost one half reported their families were middle class (49%), followed by upper middle class (22%), lower middle class (22%), lower class (3%), and upper class (3%). Finally, 41% identified themselves as third generation or more, 35% as second generation (i.e., those who were born in the United States), 14% as 1.5 generation (i.e., those who were born in another country but moved to the United States as children or teenagers), and 6% as first generation (i.e., those who were born in another country) (4% did not report their generation status).

Instruments

Perceived general stress. We used the Perceived Stress Scale (Cohen et al., 1983) to measure general perception of stress in the past month. The 10 Perceived Stress Scale items are rated on a 5-point scale ranging from 0 (*never*) to 4 (*very often*). A higher score indicates a greater level of perceived general stress. A sample item is "How often have you felt difficulties were piling up so high that you could not overcome them?" The coefficient alpha was .76 for African Americans (Pieterse & Carter, 2007) and .86 for Asian Americans (Wei et al., 2010). The coefficient alphas in this study for the Perceived Stress Scale and other scales are reported in Table 1 for the total sample and for each of the ethnic groups. The construct validity was supported through a positive association with psychological distress among African Americans (Pieterse & Carter, 2007) and depression among Asian Americans (Wei et al., 2010).

Minority stress. We measured minority stress with the Minority Status Stress scale (Smedley et al., 1993). The Minority Status Stress scale (37 items) is a self-report measure of minority stress related to having a minority status. Items are rated on a 6-point scale ranging from 0 (*does not apply*) to 5 (*extremely stressful*), with higher scores indicating greater minority stress. It includes five subscales, but we used the total score of the scale in this study. A sample item is "Having to 'prove' my abilities to others (i.e., work twice as hard)." Coefficient alphas ranged from .76 to .93 for African American, Chicano, Latino, American Indian, and Filipino students (Smedley et al., 1993). Liang, Li, and Kim (2004) reported that the coefficient alpha was .93 for the Minority Status Stress scale, and the validity of the Minority Status Stress scale was supported by positive associations with racism-related stress and psychological distress for Asian American students.

Perception of university environment. We used the University Environment Scale (Gloria & Robinson Kurpius, 1996) to assess the perception of university environment. Items were rated on a 7-point scale ranging from 1 (*not at all true*) to 7 (*very true*), with higher scores indicating a more positive perception of the university environment. A sample item is "The university seems to value minority students." Coefficient alphas were .81 for African American students (Gloria et al., 1999), .82 for Asian American students (Gloria & Ho, 2003), and .84 for Latino students (Gloria & Robinson Kurpius, 1996). Scale validity was supported by a positive association with cultural congruity among African American students (Gloria et al., 1999), Asian American students (Glo-

Table 1
Means, Standard Deviations, Coefficient Alphas, Ranges, and Correlations Among the Variables

Variable	1	2	3	4	<i>M</i>	<i>SD</i>	α	Possible range	Sample range
Total (<i>N</i> = 160)									
1. Perceived general stress	—				1.74	0.65	.87	1–5	0.00–3.80
2. Minority stress	.33***	—			2.40	0.77	.92	0–5 ^a	1.03–4.33
3. Perception of university environment	-.25**	-.40***	—		5.42	0.95	.87	1–7	3.29–7.00
4. Persistence attitudes	-.31***	-.28***	.44***	—	3.59	0.44	.85	1–5	2.67–4.83
African American (<i>n</i> = 53)									
1. Perceived general stress	—				1.69	0.65	.85	1–5	0.60–3.40
2. Minority stress	.46**	—			2.75	0.73	.89	0–5 ^a	1.21–4.33
3. Perception of university environment	-.34*	-.41**	—		5.39	0.91	.81	1–7	3.57–7.00
4. Persistence attitudes	-.42**	-.39**	.53***	—	3.63	0.43	.84	1–5	2.73–4.53
Asian Americans (<i>n</i> = 54)									
1. Perceived general stress	—				1.77	0.70	.91	1–5	0.00–3.80
2. Minority stress	.46**	—			2.19	0.71	.94	0–5 ^a	1.03–3.91
3. Perception of university environment	-.35*	-.43**	—		5.33	0.89	.88	1–7	3.29–7.00
4. Persistence attitudes	-.36**	-.26 [†]	.54***	—	3.58	0.43	.85	1–5	2.77–4.84
Latino (<i>n</i> = 53)									
1. Perceived general stress	—				1.77	0.59	.83	1–5	0.60–3.10
2. Minority stress	.18	—			2.28	0.75	.92	0–5 ^a	1.12–4.03
3. Perception of university environment	-.09	-.43**	—		5.54	1.04	.91	1–7	3.29–7.00
4. Persistence attitudes	-.15	-.30*	.31*	—	3.57	0.46	.86	1–5	2.67–4.73

Note. Higher scores on perceived general stress, minority stress, perception of university environment, and persistence attitudes indicate a higher level of perceived general stress, minority stress, perception of university environment, and persistence attitudes. All means, standard deviations, possible ranges of scores, and sample ranges are based on the item level and not the sum of the items.

^a 0 = does not apply.

[†] $p < .06$. * $p < .05$. ** $p < .01$. *** $p < .001$.

ria & Ho, 2003), and Latino students (Gloria & Robinson Kurpius, 1996).

Persistence attitudes. Persistence/Voluntary Dropout Decisions Scale (Pascarella & Terenzini, 1980) measured college students' persistence attitudes. Items on the Persistence/Voluntary Dropout Decisions Scale (30) were rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores reflecting more positive college persistence attitudes. A sample item is "It is not important to me to graduate from this university." Coefficient alphas were .86 for African American students (Gloria et al., 1999), .71 for Asian American students (Gloria & Ho, 2003), and .83 for Latino students (Castillo et al., 2006). Validity was supported by a positive association with cultural congruity and a negative association with college stress for African American students (Gloria et al., 1999), Asian American students (Gloria & Ho, 2003), and Latino students (Gloria et al., 2005).

Procedure

Participants were students from different academic majors who took introductory courses in psychology, developmental psychology, or social psychology. Participants who voluntarily participated filled out questionnaires in a small group of less than 15 students during one of the several data collection times. Participants were informed that the purpose of this research was related to minority student adjustment. Participants took approximately 20–40 min to complete the questionnaires. No personal identify-

ing information was collected, and participants were assured of the anonymity of their responses. At the end of data collection, each participant received a debriefing form and research credits toward a course grade.

Results

Preliminary Analyses and Descriptive Statistics

We first examined whether the four main variables (i.e., perceived general stress, minority stress, perception of university environment, and persistence attitudes) differed according to participants' sex, generation status, socioeconomic status, and ethnic group. A multivariate analysis of variance analysis was conducted. We found no significant results, with the exception of ethnic group (Wilks's $\lambda = .87$, $p = .01$). In the follow-up analysis of variance, the mean score of minority status stress was significantly higher for African American students ($M = 2.75$) than for Asian American and Latino students ($M_s = 2.19$ and 2.28 , respectively). On the basis of J. Cohen's (1992) analysis of effect sizes, the magnitudes of difference in means between African Americans and Asian Americans ($d = 0.78$) and between African Americans and Latinos ($d = 0.64$) reflect a large effect size. In addition, age was not significantly related to any of the main variables (all $p_s > .05$). Because the dependent variable of persistence attitudes did not vary according to any of the demographic variables, none of these variables were used as covariates in the following analyses.

Means, standard deviations, alphas, ranges of scores, and zero-order intercorrelations for the total sample and three ethnic groups separately are presented in Table 1. With the total sample, the associations among all the variables were significant ($ps < .01$). Among three separate ethnic group samples, all variables were significantly associated with each other except for the associations between perceived general stress and all other variables (i.e., minority stress, perception of university environment, and persistence attitudes) for Latino students.

Path Analysis

We used the maximum likelihood method in the LISREL 8.80 program (Jöreskog & Sörbom, 2006) to conduct the path analysis. Because the maximum likelihood method assumes normality, we used the multivariate normality test developed by Mardia (Bollen, 1989) to examine whether the data met the normality assumption. The results indicated that the data were not significantly different from multivariate normality, $\chi^2(2, N = 160) = 2.08, p = .35$. Therefore, the normality assumption was met. In addition, as suggested by Hu and Bentler (1999), we used three fit indices to assess the models' goodness of fit: the comparative fit index (CFI; values of .95 or greater), the root-mean-square error of approximation (RMSEA; values of .06 or less), and the standardized root-mean-square residual (SRMR; values of .08 or less). However, it is important to note that our hypothesized path model (see Figure 1) is close to a saturated model and has a closer-to-perfect fit in the fit index values. Thus, the magnitude of parameter estimates is more important for evaluating the model than the fit index values.

For testing the mediation effect in the path model, we followed Holmbeck's (1997) three-step procedure. The first step is to test the direct-effect-only model (i.e., minority stress \rightarrow persistence attitudes) after controlling for perceived general stress (see Figure 2A). The direct effect (i.e., minority stress \rightarrow persistence attitudes) in this model must be significant to meet the requirement for testing the mediation effect. The second step is to test the fully mediated model (i.e., our hypothesized model; see Figure 1 or Figure 2B) after controlling for perceived general stress. The third step is to test the partially mediated model (see Figure 2C). In this model, we added to the fully mediated model a direct path from minority stress to persistence attitudes. Then, we compared these two nested models (i.e., the fully and partially mediated models) to select a better model.

The results from testing the direct-effect-only model indicated that the path coefficient for the direct effect (i.e., minority stress \rightarrow persistence attitudes) was significant ($\beta = -.20, p < .05$; see Figure 2A) after controlling for perceived general stress. The significant direct effect thus met the requirement for examining a mediation effect. Next, the result of the fully hypothesized mediated model (see Figure 2B) showed a good fit to the model, $\chi^2(1, N = 160) = 0.75, p = .39, CFI = 1.00, RMSEA = .00, 95\%$ confidence interval (CI) = $[-.00, .19], SRMR = .02$. As seen in Figure 2B, increased minority stress was associated with decreased positive perception of university environment ($\beta = -.36, p < .001$), and positive perception of university environment was related to persistence attitudes ($\beta = .39, p < .001$).

Finally, we tested the partially mediated model as an alternative model (see Figure 2C) by adding a direct path (i.e., minority

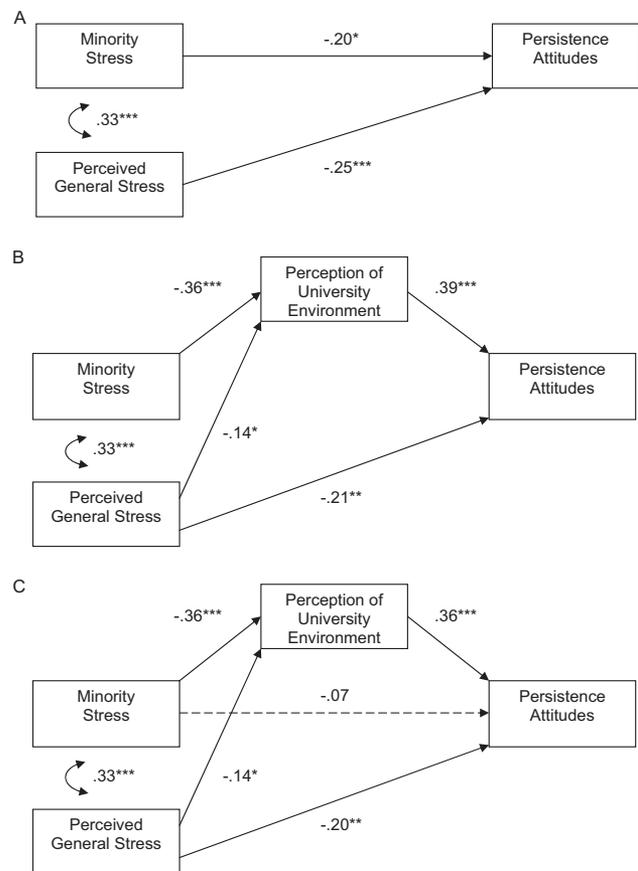


Figure 2. The direct-effect model (A), the final fully mediated model (B), and the alternative partially mediated model (C). * $p < .05$. ** $p < .01$. *** $p < .001$.

stress \rightarrow persistence attitudes) to the fully mediated model. Because the partially mediated model is a saturated model, the fit is perfect; for example, $\chi^2(1, N = 160) = 0.00, p = 1.0, CFI = 1.00$. However, when the partially mediated model was compared with the fully mediated model, the nonsignificant chi-square difference test, $\Delta\chi^2(1, N = 160) = 0.75, p = .39$, indicated no difference between the two models. On the basis of the parsimony principle, the hypothesized fully mediated model with no direct path from minority stress and persistent attitudes was the best model (see Figure 2B). This model was used to examine the significance level of the indirect effect and to conduct a multiple-group comparison analysis. In the final fully mediated model, 18% of the variance in perception of university environment was explained by minority stress and 24% of the variance in persistence attitudes was explained by the perception of university environment and perceived general stress.

We used the bootstrap method to examine the significance level of mediation or indirect effect through 1,000 bootstrap samples (Mallinckrodt, Abraham, Wei, & Russell, 2006; Shrout & Bolger, 2002). An indirect effect is significant at the .05 level if the 95% confidence interval does not include zero (Shrout & Bolger, 2002). In this study, the bootstrap results showed that the indirect effect of minority stress through the perception of university environ-

ment to persistence attitudes was significant ($b = -0.08$, 95% CI = $[-0.13, -0.03]$, $\beta = -.36 \times .39 = -.14$).

Multiple-Group Comparison

To examine whether the strengths of the structural paths were invariant across the three minority groups, we used the fully mediated model (see Figure 2B) to conduct a multiple group analysis.¹ We compared a constrained model (i.e., all four structural paths were constrained to be zero) with a freely estimated model (i.e., all four structural paths were freely estimated). The chi-square difference test was used to determine whether these four paths were invariant. The result for the constrained model was $\chi^2(11, N = 160) = 6.13$, $p = .84$, CFI = 1.00, RMSEA = .00, CI = $[.00, .07]$, SRMR = .08. The result for the freely estimated model was $\chi^2(3, N = 160) = 2.66$, $p = .45$, CFI = 1.0, RMSEA = .00, CI = $[.00, .21]$, SRMR = .05. When these two nested models were compared, the result from a chi-square difference test, $\Delta\chi^2(8, N = 160) = 3.47$, $p = .90$, indicated no significant difference between these two models. It suggests that the strengths of these four structural paths were not different across African American, Asian American, and Latino students. These four structural paths from the fully mediated model are presented separately for each of the three ethnic groups (see Table 2 and Figure 2B).

Moreover, we used the same bootstrap method as for the total sample to examine the significance level of the mediation effect separately for each of the three ethnic groups. Consistent with the result for the total sample, the results from the bootstrap method showed that the indirect effect of minority stress through the perception of university environment to persistence attitudes was significant for African Americans ($b = -0.08$, 95% CI = $[-0.16, -0.02]$, $\beta = -.31 \times .45 = -.14$), Asian Americans ($b = -0.10$, 95% CI = $[-0.22, -0.01]$, $\beta = -.32 \times .49 = -.16$), and Latinos ($b = -0.09$, 95% CI = $[-0.21, -0.01]$, $\beta = -.46 \times .28 = -.13$). Therefore, the significant pattern of the mediation effect was the same for all three ethnic groups.²

Discussion

These results provide at least two significant findings to the college persistence literature involving ethnic minority students. First, we hypothesized that the perception of university environment would mediate the association between minority stress and persistence attitudes. Our results support this mediation hypothesis. Specifically, the result of a negative association between minority stress and positive perceptions of university environment is consistent with previous studies (e.g., Park, 2009). The result that the positive perception of university environment was positively associated with college persistence attitudes is consistent with the previous persistence literature on African American students (Gloria et al., 1999), Asian American students (Gloria & Ho, 2003), and Latino students (Castillo et al., 2006; Gloria, 1997; Gloria et al., 2005; Gloria & Robinson-Kurpius, 1996). More important, this study went beyond this direct association and expanded the persistence literature by providing empirical evidence for the mediation role of the perception of university environment in the association between minority stress and persistence attitudes. With this finding, we joined Castillo et al.'s (2006) suggestion to extend Tinto's (1993) theory by adding an environ-

mental factor when studying minority students' college persistence. In particular, Tinto's theory simply assumed that students' increased involvement with the university would facilitate their integration into the university and thus did not take into account minority students' struggles with the White cultural norms and values embedded within a predominantly White university culture (Castillo et al., 2006). In contrast to his model, the mediating role of the perception of university environment in this study indicates that efforts should be made to create a diversity-friendly university environment (e.g., increasing minority faculty, staff, and student bodies) to improve minority students' retention (Museus et al., 2008).

Furthermore, even after controlling for perceived general stress, our results still support that the perception that university environment mediated the association between minority stress and persistence attitudes. Theoretically, these results support the notion that minority-related stress is distinct from general stress (Harrell, 2000; Smedley et al., 1993), and it calls one's attention to the importance of understanding minority students' adjustment and retention in colleges, particularly in predominantly White universities. Empirically, this result is similar to previous studies that demonstrated the uniqueness of minority-related stress over general stress in predicting depression in Asian American students (Wei et al., 2010) and psychological distress in African American (Pieterse & Carter, 2007) and Latino college students (Saldana, 1994).

Second, our results indicated that the significant pattern of the mediation effect was the same across African American, Asian American, and Latino students. This finding strongly increases the generalizability of our results to at least three ethnic minority student groups. These results underscore the importance of including different ethnic minority groups in one study and examining

¹ Regarding the number of participants needed for a path model in this study, Hatcher (1994) suggested that "there should be a ratio of at least 5 subjects for each parameter to be estimated" (p. 149). In LISREL, a path model has only one observed variable for a latent variable; therefore, the factor loading for each path will be fixed to 1 and the path for the error term will be fixed to zero. In our model (see Figure 1), the parameters to be estimated include variance for each of the latent variables (i.e., four variances for four latent variables) and paths among the latent variables (i.e., six paths among four latent variables). On the basis of this calculation, a maximum of 10 parameters should be estimated in our model. Because $5 \times 10 = 50$, this study's sample size meets the sample criterion on the basis of five observations per parameter to be estimated for each of three ethnic groups (i.e., 53 African Americans, 54 Asian Americans, and 53 Latinos).

² Some readers might be interested in knowing the results for the five subscales rather than the total score of the Minority Status Stress scale. However, in this study, the five subscales of the Minority Status Stress scale were highly correlated. For example, six out of 10 correlations have large effects (i.e., $r_s = .52-.75$). Therefore, multicollinearity among the predictors would be highly possible if the five subscales were used as predictors in our path model. Additionally, the size of our current samples from each ethnic group would be too small for analyzing a large model with five subscales (i.e., eight variables, 36 parameters [eight variances for eight latent variables and 28 paths among eight latent variables], 180 [$5 \times 36 = 180$] participants) but would be sufficient for our current path model (i.e., four variables, 10 parameters, 50 [$5 \times 10 = 50$] participants; see Figure 1 and footnote 1).

Table 2
Path Coefficients Across Three Ethnic Groups

Group and structural path	<i>b</i>	<i>SE</i>	β
African American (<i>n</i> = 53)			
1. Perceived general stress → perception of university environment	-0.26	0.18	-.18
2. Perceived general stress → persistence attitudes	-0.18	0.08	-.26*
3. Minority stress → perception of university environment	-0.40	0.14	-.31**
4. Perception of university environment → persistence attitudes	0.21	0.05	.45***
Asian Americans (<i>n</i> = 54)			
1. Perceived general stress → perception of university environment	-0.25	0.14	-.17
2. Perceived general stress → persistence attitudes	-0.12	0.06	-.18
3. Minority stress → perception of university environment	-0.42	0.18	-.32*
4. Perception of university environment → persistence attitudes	0.23	0.06	.49***
Latino (<i>n</i> = 53)			
1. Perceived general stress → perception of university environment	-0.02	0.20	-.02
2. Perceived general stress → persistence attitudes	-0.09	0.10	-.14
3. Minority stress → perception of university environment	-0.59	0.19	-.46***
4. Perception of university environment → persistence attitudes	0.13	0.07	.28*

Note. *N* = 160.

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

the invariance among the associations of the studied variables (Museus et al., 2008). Additionally, Museus et al. (2008) commented that inclusion of different ethnic groups in one study can also benefit researchers by allowing them to compare the mean score differences across the measures used in the study. This method helps researchers to determine whether the differences found across groups are due to ethnic group rather than to different operationalizations of measures. In this study, our results showed that the mean scores of the perception of university environment and persistence attitudes were not significantly different among these three minority student groups. As indicated by Gloria and Ho (2003), researchers generally pay less attention to Asian American students' college persistence because of the myth of model minority in this population. The current study challenges this myth by showing that Asian American students were not significantly different from African American or Latino students in terms of the perception of the university environment and college persistence attitudes. However, African Americans reported greater minority stress than their Asian American and Latino peers, which highlights the importance of differences across groups.

Limitations, Future Research Directions, and Implications

This study has several limitations. First, it relied on a self-report measure of persistence attitudes rather than actual behaviors (e.g., ultimately dropping out of the university or dropping out and returning later). Future studies might consider assessing students' actual behaviors related to college persistence (i.e., completion of a college degree). However, if we wanted to know the highest level of education attained by the participants, we could not ensure the anonymity of data collection because students might need to provide additional personal information (e.g., student university ID or name). Second, although we attempted to increase the generalizability of our final model by recruiting participants from three minority groups, the interpretation of the results should be limited to these three minority groups only. For example, the current results cannot be generalized to American Indian students until the

results are replicated in this minority group. Finally, these results are only applicable to minority students at a predominantly White college or university. Greer and Chwalisz (2007) indicated that African American students at predominantly White colleges and universities experienced higher levels of minority stress than their counterparts at historically Black colleges and universities. Because African American students at predominantly White colleges and universities and at historically Black colleges and universities face different challenges, whether the current results apply to African American or other minority students at historically Black colleges and universities is unknown.

Even though our results added several contributions to the college persistence literature, more research studies still need to be conducted. First, future studies can focus on a specific aspect of the university environment, such as the psychological dimension of the university environment (e.g., faculty interest: perceiving that faculty are interested in students' development). For example, faculty interest was associated with positive social outcomes (e.g., a sense of belonging to the university community) for Latino college students (Nunez, 2009). More studies are needed to examine what specific factors can contribute to a friendly university environment and the retention of ethnic minority students. Second, Rogers and Molina (2006) indicated that fostering mentoring relationships is a key strategy for ensuring the retention of ethnic minority students. Duester (1994) found that quantity of mentoring was positively associated with ethnic minority students' decisions to continue their college education. However, thus far this line of research is very limited. Future research studies can continue to examine the effectiveness of mentoring programs in decreasing minority stress and increasing the positive perception of the university environment and minority students' retention. Third, our final mediation model can be further examined to see whether it can be replicated among different groups of diverse students (e.g., students from other ethnic backgrounds, nontraditional students, men or women only, low-income students, or sexual minority students). Focusing on these intersections of diversity (e.g., race, age, sex, socioeconomic status, sexual orientation) can promote a

holistic understanding of the realities and experiences of students to ensure that college campuses provide a healthy environment for education (Chesler, 2004).

Regarding counseling implications, counselors first need to pay attention to minority stress, particularly among African American students. Also, counselors need to distinguish between minority stress and general stress and be familiar with recommendations for creating a nurturing university environment that honors diversity (e.g., Hurtado et al., 1999). Second, counseling centers can offer social support groups for minority students. Rollock, Westman, and Johnson (1992) indicated that support groups for African Americans helped to improve perceptions of the university environment and perceived social support. Also, support groups can provide a safe space for minority students to address minority stress (e.g., racism, interracial stress, within-group stress) and negative perceptions of the university environment at a predominantly White college campus (Gloria, 1999). Addressing these stresses and perceptions may in turn increase minority students' completion of college. Third, counselors can create brochures that contain written guidance on how to work with minority students; serve as consultants to facilitate the building of a supportive, positive university environment; or join the university diversity committee to be part of the decision-making process for university policies and practices related to diversity. Finally, when working with Asian American students, it is important to not assume that they are unaffected by minority stress on campus, have no concerns about the university environment, and have high college persistence. Asian American students are just as vulnerable as other ethnic groups to experiencing these struggles.

In conclusion, we found that the perception of university environment mediated the association between minority stress and college persistence attitudes, even after controlling for perceived general stress. Notably, the strengths of the associations in this mediation model were similar across three ethnic groups, which validates the generalizability of this mediation model.

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