

An Ecological Approach to Racial Environments and Their Relationship to Mental Health

José A. Soto¹ · Nana A. Dawson-Andoh² · Dawn P. Witherspoon³

Published online: 4 July 2016
© Springer Science+Business Media New York 2016

Abstract Although research has demonstrated that aspects of racial environments such as racial experiences and racial diversity can relate to psychological health and well-being, few studies have examined what specifically happens when individuals move from one racial environment to another. The present study asked 179 African Americans transitioning to a predominantly white institution (freshmen or junior transfers) about racial diversity (percentage of African Americans) at their prior institution, racial experiences at their prior institution, and racial experiences at the current institution and examined how these characteristics related to self-reported depression. Overall, we found that more negative previous racial experiences predicted greater depressive symptoms in college. Results also revealed a significant three-way interaction such that more positive current racial experiences predicted less depressive symptoms, but only for those students coming from

predominantly negative racial environments—low racial diversity and more negative racial experiences. Our findings highlight the complex role of past and present racial environmental factors in influencing psychological health. Implications for African American college students' success and well-being are discussed.

Keywords Racial experiences · Racial diversity · African Americans · Depression · Environmental transitions

Introduction

Research suggests that environments are both influenced by and exert influence on the people in them (Strange and Banning 2001). Environment can refer to immediate, single settings such as the family or classroom, but also to broader surroundings such as the greater sociocultural context in which one is embedded (Bronfenbrenner 1979). Specific aspects of the environment that can affect an individual's development include activities, roles, and relationships (Seidman and French 2004). Not surprisingly, these aspects of the environment are often changing as shifts in environmental context—also known as ecological transitions—are normative parts of an individual's development. These transitions can be challenging phases in an individual's life as they may represent significant discontinuities in the environment and force individuals to adapt to new roles in unfamiliar settings (Seidman and French 2004). The present study examines one such ecological transition—the shift from high school to college or change between colleges—among a sample of African American students and how aspects of the past and present environment, in terms of racial experiences and racial diversity, act individually or in conjunction to influence mental health.

José A. Soto and Nana A. Dawson-Andoh have contributed equally to this manuscript. Parts of this manuscript are based on work submitted by the second author in partial fulfillment of the doctoral degree requirements at the Pennsylvania State University.

✉ José A. Soto
jas95@psu.edu

Nana A. Dawson-Andoh
Nana.Dawson-Andoh@va.gov

Dawn P. Witherspoon
dpw14@psu.edu

¹ Department of Psychology, Pennsylvania State University, 310 Moore Building, University Park, PA 16802, USA

² VA Palo Alto Health Care System, 3801 Miranda Ave, Palo Alto, CA 94304, USA

³ Department of Psychology, Pennsylvania State University, 217 Moore Building, University Park, PA 16802, USA

Ecological Transitions

Ecological transitions can disrupt the consistency of relations or transactions between an individual and their environmental context, especially if the previous and current settings are seemingly incompatible (Seidman 1988). The greater the incongruity between the environmental contexts involved in an individual's transition, the more difficult the developmental challenges may be for that individual. Bronfenbrenner (1979) theorized that incompatibilities between an individual and the environment in which one inhabits—the level of *person–environment fit*—may lead to negative psychological and emotional consequences. The person–environment fit in a given context is naturally influenced by the previous environment insofar as an individual has likely already been shaped by that prior context. School transitions in particular may interrupt the person–environment fit as they involve important shifts in both roles and settings. Some researchers have classified shifts in the academic environment as “risky transitions” because they can impact the psychological adjustment of adolescents (Ruble and Seidman 1996). The transition to college is one such risky transition (Astin 1993) and may be especially so for African American students when incongruities exist between their racial heritage and the campus environment (Berger and Lyon 2005; Davis 1994; Gibbs 1973; Hughes 1987; McEwen et al. 1990; Nora and Cabrera 1996; Sedlacek 1999; Solórzano 2000; Turner and Fries-Britt 2002). In addition to experiencing the usual challenges in making a successful transition to college, African Americans also face the added burden of adjusting to a new racial environment which may include experiencing college campuses as racially hostile or as not a “good fit” for them (Carter et al. 2006).

Two factors that make up the overall racial environment that may impact the person–environment fit for African American college students are their racial experiences and the level of racial diversity, both in college and at the institution they attended immediately prior to college. The unique combination of these precollege and college environments may have differential impacts on the healthy functioning of African American college students whose racial backgrounds often contribute to significant difficulties in social and cultural contexts. For instance, African American college students are likely to experience discrimination as well as a lack of support to deal with such negative experiences, which can result in several adverse psychosocial and health outcomes (Finch and Vega 2003; Seidman and French 2004; Williams and Mohammed 2009). The extent to which African Americans feel adequately prepared to deal with discrimination and other negative racial experiences in college might understandably be affected by the types of racial experiences they

have had *prior* to arriving at college. Furthermore, the likelihood of encountering these negative racial experiences or how an individual copes with them may be dependent on the racial diversity of both environments. By examining racial experiences and racial diversity during attendance at college and before coming to college, we hope to begin to distinguish the ways in which these dynamic aspects of the racial environment can affect the mental health outcomes of African Americans in college.

Racial Experiences

An important aspect of the racial environment on campus consists of interethnic attitudes and interactions among various ethnic groups (Hurtado et al. 1999). These factors are likely to be relevant for many ethnic minority students given that they are more likely to attend predominantly white institutions (PWIs), which are often more accessible than historically black colleges and universities (HBCUs) as they greatly outnumber HBCUs (Gloria et al. 1999). Not surprisingly, ethnic minority students generally report a different set of racial experiences on college campuses than their white counterparts. Ethnic minority students are more likely to experience a racially insensitive climate and have higher perceptions of racial discrimination and prejudice than whites at PWIs (Mow and Nettles 1990; Nora and Cabrera 1996; Strange and Banning 2001). Minority students are also more likely to characterize the campus climate as hostile, disrespectful, and less accepting of minority groups (Smith et al. 2007; Rankin and Reason 2005).

These perceptions of racial climate, driven primarily by racial experiences, are an important factor in the adjustment process for ethnic minority college students (Hurtado and Carter 1997). In general, evidence supports the assertion that the ability of ethnic minority students to successfully adjust to college is highly related to the experience of a positive racial climate on campus (Rankin and Reason 2005). Conversely, perceived campus racial hostility has been related to higher levels of anxiety, depression, and loneliness (Mounts 2004). To the extent that poorer mental health is related to lower academic performance (Fazio and Palm 1998; Hysenbegasi et al. 2005), negative racial experiences may not only impact psychological well-being, but also shape academic success. Thus, African American students who perceive the college climate negatively (by way of reporting negative racial experiences) may likely experience poorer mental health. However, African American students who report more positive racial experiences in the college environment may report healthier functioning.

One consideration that may be critical to understanding the impact of current racial experiences on African

American students at a PWI is the role of *previous* racial experiences. Past research suggests that the degree of incongruity between the racial experiences at the institution attended immediately before college and the racial experiences at that PWI may impact the transition to college (Davis 1994; Sherman et al. 1994). Students who characterize their previous institution's racial experiences as positive and transition to a college where they experience more negative racial experiences may experience greater psychological difficulties than those who experience more negative climates in their prior institution. In fact, coming from a prior environment where racial experiences are predominantly negative to a PWI where the racial experiences are also deemed to be negative may have little impact on mental health if the prior experiences helped "steel" the individual for the challenges ahead. African American students who attend PWIs often have to navigate an environment in which their presence on campus may be scrutinized or where their talents and abilities may be doubted, leading to a decreased sense of belonging and poorer psychological adjustment (Davis et al. 2004; Mounts 2004; Solórzano et al. 2001). Thus, prior racial experiences might either exacerbate (contrast effect) or mitigate the effects of negative racial experiences in college (preparation effect), making it crucial to study these factors together in order to understand how they interact to impact psychological health.

Racial Diversity

Racial diversity refers to the numerical representation of diverse groups on a campus (Gurin et al. 2003). Studies have demonstrated the toll that a lack of diversity can have on African American students. These students often report greater anxiety and discomfort as they may feel forced to become acclimated into a community that is often unprepared and unwilling to accept them and their cultural differences (Fries-Britt 1998; Jones 1997). African American students also report feelings of alienation and exclusion that is linked to the lack of diversity in their surroundings, especially the lack of other African Americans (Allen 1992; Davis et al. 2004; Jones et al. 2002). These feelings are not uncommon and are often compounded as many African American students struggle with adapting to a traditionally white environment (Patton 2006).

Just as considerations of the previous environment might be critical in understanding how racial experiences impact the well-being of African American college students, we must also consider how racial diversity in the current environment may be closely related to experiences of racial diversity in their prior environment. Students from more ethnically diverse neighborhoods, high schools, and social networks typically display better adjustment to college life than students

from less ethnically diverse environments (Adan and Felner 1995; Chavous et al. 2002; Davis 1994; Massey and Fischer 2006; Sherman et al. 1994). Graham and colleagues (1985) found that although the racial and ethnic composition of one's home neighborhood was influential in terms of African American college students' adjustment to life at PWIs, it was not as influential as the diversity of the secondary school environment. Importantly, the relative change in racial diversity from the precollege context to the college context may be just as important. For instance, it has been shown that the transition from middle school to high school can be particularly challenging for African American students (more loneliness and steep declines in grades) when the number of African Americans declined significantly (Benner and Graham 2009). This same phenomenon may also hold true for the transition to college or between colleges, such that African Americans making the transition from prior institutions with high racial diversity (i.e., greater proportion of African Americans) to a PWI with relatively fewer African Americans might also be expected to have more negative mental health consequences. A greater proportion of whites in the precollege environment has also been shown to predict more positive interactions with diverse peers in college and a greater sense of belonging, suggesting that different kinds of diversity shape college adjustment outcomes differently (Locks et al. 2008).

Naturally, racial diversity on a campus can also interact with the perceptions of racial experiences on that campus to influence mental health and well-being. For example, the amount of informal student interaction with diverse peers has been shown to have a positive effect on perceptions of the campus climate, a construct which often encompasses the types of racial experiences students have had (Chang 1999; Hurtado et al. 1999). The interactions between the multiple aspects of the racial environment (diversity and racial experiences) are made even more complex when one considers how these factors work together across time and place. Consistent with this notion, Locks and colleagues (2008) found that a greater proportion of whites in the precollege environment predicted more positive interactions with diverse peers in college and a greater sense of belonging in college, two aspects that shape an individual's perception of racial experiences. Thus, the racial diversity of the precollege environment as well as precollege racial experiences may be meaningfully related to the perceptions of racial experiences by African Americans in the college context. Our understanding of this dynamic interplay can only be fully realized by research that examines all of these variables simultaneously.

The Present Study

In order to better understand how precollege racial environments interact with college environments to predict the

psychological health of African American college students (as measured by depressive symptoms), we examined changes in two aspects of the racial environment—racial experiences and racial diversity—in individuals transitioning to college. This included entering freshmen as well as junior students transferring in from other schools or campuses. Although our primary focus was on how these variables interacted, we nevertheless expected individual associations with mental health in line with previous findings. We therefore hypothesized the following:

1. Students transitioning to a PWI from previous institutions with high levels of racial diversity (greater proportion of African Americans)—likely experienced as a negative change upon arrival at a PWI—would experience greater current depressive symptoms. This would be consistent with findings indicating overall better adjustment to college among those coming from more diverse environments (Adan and Felner 1995; Chavous et al. 2002; Davis 1994).
2. Students reporting more positive racial experiences while in college would report lower depression symptoms, consistent with the literature regarding the benefits of positive racial climates to the functioning of ethnic minority college students (e.g., Hurtado and Carter 1997; Rankin and Reason 2005).
3. A significant two-way interaction between previous and current racial experiences such that individuals coming from an environment in which they had more positive racial experiences would show more depressive symptoms when they perceive the current environment to be characterized by more negative racial experiences (vs. positive current racial experiences) given the greater negativity experienced.
4. A significant three-way interaction such that the interaction effect specified above would be magnified for those students coming from a prior institution with greater racial diversity, given the contrast experienced in transitioning to a PWI, an environment with lower racial diversity which may relate to a lower sense of belonging and possibly less support to cope with negative racial experiences.

Method

Participants and Procedure

Participants were 179 African American college students at a large, predominantly white university in the mid-Atlantic region of the USA. These data were collected over a course of 3.5 years, as a part of two different studies of African American college student health and well-being, resulting

in three distinct cohorts. The first cohort included 33 participants who completed the entire survey out of 83 who began or partially completed the survey (40 % completion rate); the second cohort consisted of 57 participants (81 % completion rate); and the third had 89 participants (91 % completion rate). Data from the three studies were combined to provide greater statistical power to examine the questions of interest given the high degree of similarity between the study samples and study designs. In fact, ANOVA analyses comparing the three cohorts on the principal study variables yielded no significant differences.

The final sample included slightly more women (58.7 %) than men (41.3 %), had a mean age of 19.28 years (SD = 1.39), and was made up of 101 freshman (56.4 %) and 78 junior transfers (43.6 %). Junior transfers came either from affiliated campuses within the same university system or from other colleges. All participants were relatively new to the university and had been on campus from one to two semesters when they completed the survey. Annual household income while growing up varied, with 7.3 % of participants household income being less than \$15 K, 18.4 % in the \$15–\$30 K range, 19.6 % between \$31 and \$45 K, 19 % between \$46 and \$60 K, 14 % between \$61 and \$75 K, and 21.2 % of participants reporting household income greater than \$75 K.

Participants were asked to complete an online survey that included the following measures (in order of administration): demographic questions, mental health symptom inventory, and campus climate. Because participants came from two different studies, some additional non-overlapping questionnaires were completed by each cohort. For the present study, we focused exclusively on mental health and therefore limit our presentation and discussion to those measures relevant to our primary research question. Approximately, half of the participants were recruited from the general campus population for \$10 in compensation. The other half of the participants completed the study for course credit. Only participants who self-identified as current freshmen or junior transfer students were eligible.

Measures

Demographic Questions

Respondents were asked about their age, gender household composition, head of the household information (including educational attainment), and family income. Family income was reported using a 1–5 scale, using \$15 K increments (1 = \$0–15 K and 6 = \$75 K or higher). On average, participants' family income ranged from \$45 to 60 K which can be characterized as medium SES category (Thompson and Hickey 2011).

Mental Health

The Brief Symptom Inventory–18 (BSI-18; Derogatis 2001) was used to measure psychological health. It is an 18-item self-report inventory in which respondents rate their level of distress over the past week using a 5-point scale ranging from 0 (not at all) to 4 (extremely). For the present study, the scale was changed from 1 to 5 in order to keep it consistent with other items being rated. Generally, mean scores on three dimensions—somatization, depression, and anxiety—are derived from the entire set of items. Each of these clinical subscales is comprised of six items, resulting in a possible range of scores from 5 to 30. Past research has validated its use as a measure of general psychological distress (Asner-Self et al. 2006; Prelow et al. 2005) and established satisfactory reliability indices ranging from .73 to .84 (Derogatis 2001). Although the BSI-18 has been examined with a number of minority populations (e.g., Latinas in the U.S. and Central American adult volunteers), there are no studies with African American adolescents, warranting an examination of its factor structure within the current sample.

A factor analysis of the 18 BSI items was conducted in SPSS using a principal axis factoring and an oblimin rotation. This method of extraction has been suggested to be more accurate in capturing the underlying factor structure of a set of items (Costello and Osborne 2005). The direct oblimin rotation allows factors to correlate, which we would expect given the presumed psychological distress tapped by all the items. Table 1 lists the BSI items along with their factor loadings. The results yielded three factors, but only the loadings for the depression items, minus item 17 (thoughts of ending your life), were consistent with the original depression subscale (factor 2). The remaining somatization and anxiety items were primarily loading on factor 1, with a few random items loading on factor 3, with no discernible pattern differentiating the two sets of loadings. This analysis suggests a clear depression factor and a possible anxious-somatization subscale, but this latter factor was diffuse and less conceptually clear. Therefore, we utilized a modified depression subscale that consisted of the original depression items minus the suicidality item as our sole dependent variable for the present study.

Racial Experiences

The Racial Experiences subscale of the Racial Climate Scale (RCS; Reid and Radhakrishnan 2003) was utilized to capture the types of racial interactions and experiences perceived by participants at college and their previous institution. The subscale consists of the mean of five items that assesses the extent to which students had experienced or witnessed examples of discrimination or poor treatment

on their campus. Participants were asked to respond to statements such as “This campus is more racist than most,” “I have experienced racial insensitivity from other students,” and “Students of other races or ethnic groups seem uncomfortable around me” using a response scale ranging from 1 (strong agreement) to 7 (strong disagreement). Thus, high scores on the racial experiences scale represent more positive racial experiences.

The questionnaire was duplicated to reflect the previous institution (i.e., high school or prior campus) as well as the current institution (i.e., college). Thus, respondents answered ten questions in all—five capturing their racial experiences at the previous institution and five for racial experiences at college (the current institution). The authors of the scale reported reliability coefficients of .70 for the Racial Experiences subscale. Validity of the RCS has been established through positive associations with a general campus climate scale as well as significant racial group differences on the measure. African American students reported more negative racial experiences than Latino and Asian-American students, who reported more negative experiences than white students which suggest that this measure can measure experiences of varying racial groups (Reid and Radhakrishnan 2003). For the present study, the scale showed excellent internal consistency for prior environment racial experiences ($\alpha = .91$) and very good internal consistency for current environment racial experiences ($\alpha = .87$).

Previous Racial Diversity

We assessed racial diversity at the previous institution using a continuous variable that asked respondents to indicate the approximate percentage of African Americans at their previous institution (1 = 0–10 %, 2 = 11–20 %, 3 = 21–30 %, 4 = 31–40 %, 5 = 41–50 % and 6 = >50 %). Since the current level of racial diversity at college was constant across the sample (four percent), the racial diversity variable provided an implicit comparison between the racial diversity at the prior institution versus that at college. Thus, those who attended a prior institution with the least racial diversity (0–10 %) represented little to no change in racial diversity from prior institution to college, while those who reported greater racial diversity (11 % or higher) experienced a relative decrease in the percentage of African Americans in their environment between the prior institution and college.

Data Analysis Plan

Our primary analytic strategy involved conducting a series of hierarchical multiple regressions with racial experiences at the prior institution, racial experiences at college, and

Table 1 Principal axis factoring loadings with direct oblimin rotation pattern matrix for the BSI-18 items

Items	Factor loadings		
	Factor 1	Factor 2	Factor 3
Faintness or dizziness (S)	.422		
Feeling no interest in things (D)		-.623	
Nervousness or shakiness inside (A)			.775
Pains in heart or chest (S)	.697		
Feeling lonely (D)		-.850	
Feeling tense or keyed up (A)			.571
Nausea or upset stomach (S)			.483
Feeling blue (D)		-.760	
Suddenly scared for no reason (A)	.536		
Trouble getting your breath (S)	.609		
Feelings of worthlessness (S)		-.661	
Spells (episodes) of terror or panic (A)	.863		
Numbness or tingling in parts of your body (S)	.678		
Feeling hopeless about the future (D)		-.665	
Feeling so restless you couldn't sit still (A)	.521		
Feeling weak in parts of your body (S)	.516		
Thoughts of ending your life (D)	.737		
Feeling fearful (A)	.677		

Note Respondents are asked to indicate the extent to which they have been troubled by the following complaints. The letter in parentheses after each item indicates the intended subscale based on the original scale (*S* somatization, *D* depression, *A* anxiety)

racial diversity at the prior institution entered as the predictor variables, and the modified depressive symptoms scale as our dependent variable. Given that research shows that SES and gender are associated with mental health outcomes (Adler and Conner Snibbe 2003; Denton et al. 2004; Robins and Regier 1991; Witt 2006), we controlled for gender and family's annual household income during childhood in all analyses. We were primarily interested in the possible interactions between our independent variables of the current and past racial environment, although main effects were also examined and reported. Thus, after entering each independent variable into the model separately, we next entered all the possible two-way interactions into the model as one step, followed by the three-way interaction in the final step.

Results

Descriptives

Before proceeding with our primary analyses, we examined the breakdown of previous institution racial diversity (percent of African Americans as reported by the participants) across the sample. Approximately, 23.5 % of the sample came from schools (high school, branch campus, or

other university) with a low percentage of African American students (<10 %). Thus, this group represented the greatest similarity in racial diversity to the college environment (four percent for current sample). Nineteen percent of the sample attended schools with racial diversity ranging from 11 to 20 %; 14 % reported attending schools with a 21–30 % racial diversity; 12.8 % attended schools with racial diversity of 31–40 %; and 11.2 % reported school racial diversity of 41–50 %. The remaining 19.6 % attended schools with racial diversity of 50 % or greater.

In terms of the primary variable descriptives, means and standard deviations are presented in Table 2, for the overall sample, as well as separately for freshman and juniors. We also report the *t* test results for the comparison of means between these two groups. Both previous and current racial experiences were rated, on average, above the scale midpoint on the 1–7 scale, indicating slightly more positive racial experiences. Structural diversity means showed that the participants on average came from previous institutions with a moderate number of other African Americans (i.e., between 21 and 30 %). Additionally, overall, the sample had moderate levels of psychological symptoms with average scores of their depression symptoms close to the midpoint on a 1–5 scale. Freshmen reported more positive racial experiences at both their previous institutions, $t(176) = 2.63$, $p < .01$, and currently, $t(172.46) = 2.12$,

Table 2 Primary variable descriptives for the entire sample and for freshmen and juniors, separately

Variable	Overall sample ($N = 179$)	Freshman ($n = 101$)	Junior transfer ($n = 78$)	t (df)
Income	3.78 (1.59)	3.82 (1.57)	3.73 (1.64)	.37 (176)
SDHS	3.28 (1.85)	3.46 (1.96)	3.05 (1.67)	1.49 (175.11)
PRC	4.78 (1.61)	5.05 (1.67)	4.41 (1.47)	2.63 (176)**
CRC	4.49 (1.58)	4.71 (1.64)	4.21 (1.44)	2.12 (172.46)*
Modified depression score	1.95 (.91)	1.91 (.82)	1.98 (1.03)	-.45 (141.50)

Note Degrees of freedom are adjusted based on Levene's test in instances where equal variances cannot be assumed

* $p < .05$; ** $p < .01$

$p < .05$, than their junior transfer counterparts. Class standing was unrelated to the modified depression subscale score or any other variables of interest.

Correlations between primary study variables are presented in Table 3. Positive scores on the racial experience measures indicate more positive experiences. Self-reported racial experiences at the prior institution were significantly and negatively related to gender, such that women (coded as 1; men coded as 2) were more likely to report more positive racial experiences at the prior institution. More negative racial experiences prior to college were also related to more negative self-reported racial experiences at college and with greater self-reported depression in college. Interestingly, current college racial experiences were not correlated with any other variables. Racial diversity at the prior institution was unrelated to previous or current racial experiences, although greater diversity at the prior institution was significantly related to lower income while growing up. Income was also negatively related to depression.

Primary Analyses

Table 4 depicts the hierarchical regression model highlighting the main effects and the interactions between our

main predictors (previous racial diversity, previous racial experiences, and college racial experiences) and our modified depression subscale. The analyses presented included gender and income as control variables. However, we also ran identical models that included parent education level and recruitment cohort (three-level categorical variable represented in the regression as two contrast coded variables) entered as control variables. The pattern of findings was consistent for each of the models, so we only present the model controlling for gender and income with the unstandardized coefficients corresponding to those obtained in the final step of the model with all variables included.

As can be seen from Table 4, after controlling for the significant effect of income on depression in the sample, racial diversity of the previous institution did not significantly predict depression symptoms, contrary to Hypothesis I. Current racial experiences were unrelated to depressive symptoms, failing to support Hypothesis II. Although not predicted, more negative racial experiences at the previous institution were significantly associated with more depressive symptoms in college ($\beta = -.19$, $p < .05$).

Next we tested the various interaction terms. We hypothesized a two-way interaction between previous and

Table 3 Bivariate correlations between racial environment variables, control variables, and the primary dependent variable

Correlations	1	2	3	4	5	6
1. Gender	–					
2. Income	-.06	–				
3. Previous racial diversity	.00	-.17*	–			
4. Previous racial experiences	-.17*	.09	-.03	–		
5. Current racial experiences	-.09	.00	-.09	.53**	–	
6. Modified-BSI depression subscale	-.07	-.19**	.03	-.19*	-.14	–

Note Gender was dummy coded with 1 representing female and 2 representing male. Higher scores on the racial experiences scales indicate more positive experiences; Higher scores on the previous racial diversity variable indicate a higher proportion of African Americans in the institution immediately prior to college; Higher scores on the depression subscale indicate greater depressive symptomatology

* $p < .05$; ** $p < .01$

Table 4 Summary of hierarchical regression analysis predicting modified depression subscale from the BSI-18 ($N = 179$) from primary racial environment variables

Variable	B	SE	<i>T</i>	ΔR^2	ΔF	df_{num}	df_{den}
Gender	-.219	.134	-1.64	.049*	4.45*	2	172
Income	-.111	.042	-2.65**				
Previous racial diversity (PRD)	.025	.038	.64	.001	.10	1	171
Previous racial experiences (PRE)	-.110	.051	-2.16*	.040*	7.42**	1	170
College racial experiences (CRE)	-.045	.050	-.91	.0003	.47	1	169
PRE \times CRE	.017	.022	.78	.023	1.46	1	166
CRE \times PRD	.014	.024	.59				
PRE \times PRD	.017	.025	.66				
PRE \times CRE \times PRD	-.033	.011	-3.16**	.051*	10.00**	1	165

Note All racial environment variables were centered, and these centered variables are used for the calculation of the interaction terms

* $p < .05$; ** $p < .01$

current racial experiences (Hypothesis III) and a three-way interaction between these two variables and racial diversity (Hypothesis IV). Although, there was not a significant two-way interaction, failing to support Hypothesis III, a significant three-way interaction did emerge in predicting depressive symptoms ($\beta = -.26$, $p < .01$, $\Delta R^2 = .05$, $p < .01$). In order to understand the nature of the significant three-way interaction, we conducted post-hoc analyses of the interactions according to the guidelines outlined elsewhere (Aiken and West 1991; Dawson and Richter 2006). Figure 1 displays a graphical depiction of the three-way interaction, by plotting previous and current racial experiences at high (+1 SD) and low (-1 SD) values of each variable, and depicting these plots separately for low and high values of previous racial diversity (% of African Americans at previous institution).

As can be seen from Fig. 1a, b, the interaction is primarily driven by the different relationship between depression and current racial experience for participants coming from largely negative racial environments (low racial diversity at previous institution and negative racial experiences). For these individuals, current positive racial experiences had a significant buffering effect on depression scores in college, whereas for all other individuals, current racial experiences were not significantly related to depression, regardless of the particular combination of previous racial experience and previous racial diversity. Furthermore, the slope of the line for those coming from these largely negative racial environments (top line in panel a) was significantly different from those coming from lower racial diversity environments where racial experiences were positive (bottom line in panel a; $t = 2.36$; $p = .02$) as well as the slope of the line representing those coming from environments with greater racial diversity, but where the racial experiences were largely negative (top line in panel b; $t = 2.13$; $p = .04$).

While we predicted a three-way interaction, we anticipated that the effects of negative racial experiences in college on depressive symptoms would be worse for students at a PWI who are coming from an environment characterized by positive racial experiences and greater racial diversity given the contrast between the two environments. In contrast to the prediction of Hypothesis IV, however, we found that negative racial experiences in the college environment were associated with the greatest depressive symptoms among those coming from predominantly negative racial environments (negative previous racial experiences and low racial diversity).

Post-Hoc Analyses

The unexpected nature of our findings led us to ask two additional questions with respect to our data. First, we examined whether the pattern of findings was dependent on the class standing of participants in the data (freshman vs. junior). This variable was not included in the planned analyses because class standing was not related to depression in our sample. In addition, the inclusion of another variable in the model and its interaction with all other variables would produce a highly complex model that would be underpowered given our sample size. However, as an exploratory examination, we repeated the primary hierarchical regression analysis with the modified depression score, including class standing [dummy coded as 0 (freshman) and 1 (junior)] in a step by itself, and then as an interaction with previous racial experiences and the three-way interaction, the only significant steps in the original analyses. The results were unchanged, and class standing was not a significant predictor of depression either alone or in combination with the other terms. Thus, the findings appear to adequately capture the collective experience of

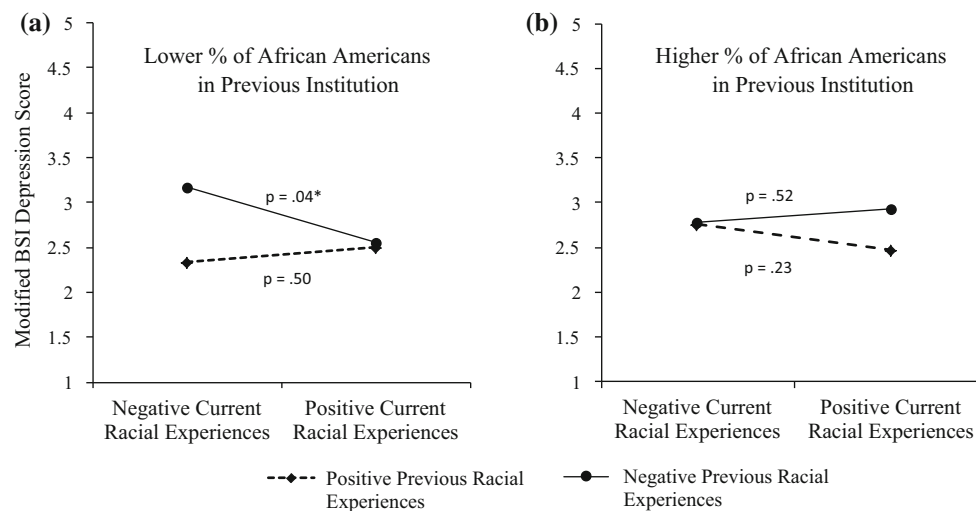


Fig. 1 Relationship between depressive symptoms and racial experiences in college given negative and positive previous racial experiences for those coming from prior institutions with **a** lower

African American representation and **b** higher African American representation. *p* values for simple slope tests are presented immediately above and below the *top* and *bottom* lines, respectively

students in their first year of transition to the current college environment.

Second, although the results of the factor analysis suggested one reliable factor and a second, less interpretable factor, we reran the analysis using the overall BSI mean score, as opposed to the modified depression subscale score. This would presumably provide an overall index of psychological distress that captures both the depressive symptoms, but also the more physiologically oriented somatic and anxiety symptoms. The results of this analysis reveal the same pattern with regard to negative previous racial experiences predicting greater overall psychological distress ($B = -.10$, $SE = .042$, $p = .017$). The three-way interaction in this analysis was only marginally significant ($B = -.02$, $SE = .009$, $p = .09$), though the pattern was similar to the primary analysis reported above. Thus, the specific interaction we uncovered appears to be more specific to psychological symptoms associated with feelings of sadness, and less with a broader distress construct that also incorporates more physiological experiences and sensations.

Discussion

The primary goal of this study was to examine how ecological transitions in the racial environment impact the mental health of African American undergraduates at a predominantly white institution (PWI) of higher learning. Specifically, we were interested in how racial experiences at prior institutions (high school or other college) and current college environments, in addition to the level of

racial diversity at the previous institution might interact to influence mental health symptoms when transitioning to a PWI. By and large, we found that some of these factors can be important predictors of psychological health in college, individually and in conjunction with one another, but in ways that we did not anticipate. Perhaps, most prominently, we found that previous negative racial experiences were consistently related to more detrimental mental health in college. We also found that the detrimental effects of prior negative environments (low diversity and negative racial experiences) can be offset, to a degree, by positive racial experiences at the PWI, demonstrating the importance of examining these variables together and not just independently as has typically been done in the literature.

Interactive Effects of Racial Environment Variables

Our data are consistent with the notion that transition or significant shifts in the environmental context can have meaningful negative psychological and emotional consequences (Bronfenbrenner's 1979; Schwartz et al. 2010; Tseng and Yoshikawa 2008) for the individual. Although the three-way interaction we found was small in magnitude, it has also been a relatively robust finding, emerging as significant after only one cohort of data had been collected. Thus, we believe that this finding provides general support for the notion that aspects of both the prior and current environment may be informative to understand current psychological functioning. The specific nature of the interaction primarily highlighted a difference in how individuals with negative previous racial experiences and low previous racial diversity (a globally or uniformly

negative racial environment) responded to racial experiences in the current environment. For individuals coming from less diverse and racially unfriendly environments, depression symptoms were the highest overall and these symptoms tended to show a significant decrease as college racial experiences were more positive. For everyone else, racial experiences in college were unrelated to depressive symptoms.

African Americans coming from globally negative racial environments may be so discouraged that they have minimal or even negative expectations for positive racial experiences in college. The prospect of attending a PWI might be met with expectations of more of the same in terms of racial environment (low diversity, negative racial experiences)—an expectation borne out by prior investigations (Patton 2006; Smith et al. 2007). Nevertheless, there may be an inevitable disappointment for those who feel the racial experiences are just as negative in their present environment as they were previously. The silver lining to this predicament is that positive racial experiences in college may carry a lot more weight for these individuals as they can disprove possible negative assumptions or expectations about how race manifests in their new environment. This realization may bring with it a greater sense of belonging which may account for the lower depression scores. In fact, data from Locks and colleagues (2008) demonstrate the link between positive interactions with diverse peers and sense of belonging, though they did not measure depression. Thus, increasing the likelihood of positive racial experiences on PWI campuses represents a potential point of intervention that stands to have great impact.

Interestingly, although these individuals from globally negative racial environments in our study are the only ones in our sample to demonstrate the positive benefits to psychological health associated with perceptions of concurrent positive racial environments, this is the prevailing expectation and finding in the literature regarding current racial climate and its impact on minority youth (Mounts 2004; Rankin and Reason 2005). One possible explanation for this finding is that there is something unique about our data or the context in which our data were collected. For example, current events highlighting the negative racial climate for African Americans in this country (e.g., police brutality, human rights violations) may have magnified both the perception of a negative climate prior to attending a PWI while also amplifying the relief of encountering an environment where racial experiences are positive. It could also be that the majority of college-bound minority students represent this particular type of ecological transition. That is, most universities are PWIs and those entering these institutions may be more likely to come from schools that are relatively low in African American representation,

which is often associated with poorer racial climates and experiences (Davis et al. 2004; Jones et al. 2002). Thus, prior findings may be sampling from a pool of possible participants that closely resembles our “exception.”

In contrast to those coming from globally negative racial environments, those coming from globally positive (high racial diversity and positive racial experiences) or mixed racial environments (high levels of African American students, but negative racial experiences or vice versa) in their previous institution demonstrated no relationship between current racial experiences and psychological health. For these individuals, the presence of any positive racial environment factors in their prior environment (either positive racial experiences or high levels of diversity or both) might be sufficient to draw attention away from racial environment variables, buffering against the interpretation of positive or negative racial experiences in ways that connect to their overall level of psychological functioning.

Effects of Individual Racial Environment Variables

Despite our primary focus on the interactive effects of environmental variables in predicting mental health, our findings indicated that previous racial experiences were a consistent and relatively robust predictor of mental health in college. African Americans reporting more negative racial experiences prior to college tended to report greater depression in college as well as greater overall psychological distress as indicated by the overall BSI score. Although the absolute levels of these symptoms were in the middle range, the fact that previous racial experiences could be so impactful in the present environment is an important lesson. Our data point to a possible negative biasing that may occur even before students arrive on a PWI college campus. The mechanism behind this effect is not known, but one possibility is that these students develop a heightened sense of rejection sensitivity whereby they expect to not fit in or expect to be treated poorly because of their race (Mendoza-Denton et al. 2002). This rejection sensitivity may be further sharpened by being in an environment such as a PWI where their minority status is quite salient. However, another interpretation of this finding is that our participants might have been too new to the current racial environment to accurately assess the racial experiences within their new setting compared to their previous institution. This may lead students to rely heavily on their past racial experiences in determining their current racial experiences, a pattern supported by the high correlation between perceptions of previous and current racial experiences. Over time, the importance of the previous racial experiences may diminish as the students become more familiar with the racial experiences of their new environment, independent of their previous institution.

Limitations and Future Directions

A number of limitations of the current work are worth noting. As is the case with cross-sectional studies, we cannot infer causation from these findings. In particular, the lack of an assessment of psychological functioning prior to college prevents us from ruling out the possibility that increased depression prior to arriving on campus might drive students to perceive more negative racial experiences. Longitudinal studies of African Americans where they can be followed from high school and throughout college are necessary in order to gain a better appreciation of the direction of the causal arrow in the relationships discussed here. Another limitation of the current study was the relatively short length of time participants had been on campus (approximately 1–2 semesters) when asked to participate in the study. As a result, there may not have been enough time to develop an accurate or stable sense of the current racial environment, possibly skewing our results in favor of the previous racial climate.

Another limitation of our study is that we limited our examination of racial diversity (both in the previous institution and in the current institution) to the proportions of African Americans in the school. Asking about the number of other minority groups in the previous institutions might have changed how racial diversity related to our other key variables and outcomes. For instance, being surrounded by students from other minority groups may have helped the students in our study feel less alone and influenced their mental well-being. Although our sample size was of moderate size, the number of freshman and juniors was not sufficient to permit a full test of whether the findings were equivalent for both of these groups. Even though a preliminary test suggested more similarities than differences, freshman and junior transfer students can also be quite different in other ways (Laanan 2000; Rendón and Nora 1994), and they did differ in their reports of previous and current racial experiences. Finally, future studies should assess African American's expectations of the campus racial climate and racial diversity at their future PWI before they arrive in order to understand if a disparity between their expectations and the reality contributes to the experience of depressive symptoms or overall adjustment.

Conclusion

Our study findings suggest that changes in environmental contexts may have significant effects on the mental health of African American college students at predominantly white institutions. Understanding how various factors may interact—specifically racial diversity and racial experiences—can be helpful to those individuals (e.g., faculty, academic advisors, etc.) concerned with helping these

students adjust to a college environment as it provides some valuable insight into the possible cause of attrition of African American students in their first 2 years at a PWI. Given that recent statistics indicate that only 46 % of African Americans who attend college graduate within 6 years (Astin and Oseguera 2005), understanding experiences of African American students during the college transition is critical. Universities may be able to utilize these findings to inform programs designed to promote the persistence at college and healthy psychological functioning of African American students at PWIs.

References

- Adan, A., & Felner, R. D. (1995). Ecological congruence and adaptation of minority youth during the transition to college. *Journal of Community Psychology*, 23(3), 256–269.
- Adler, N. E., & Conner Snibbe, A. (2003). The role of psychosocial processes in explaining the SES-health gradient. *Current Directions in Psychological Science*, 12, 119–123.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks: Sage.
- Allen, W. R. (1992). The color of success: African-American college student outcomes at predominantly white and historically black public colleges and universities. *Harvard Educational Review*, 62(1), 26–44.
- Asner-Self, K. K., Schreiber, J. B., & Marotta, S. A. (2006). A cross-cultural analysis of the Brief Symptom Inventory-18. *Cultural Diversity and Ethnic Minority Psychology*, 12(2), 367–375.
- Astin, A. W. (1993). *Achieving educational quality: A critical assessment of priorities and practices in higher education*. San Francisco: Jossey-Bass.
- Astin, A. W., & Oseguera, L. (2005). *Degree attainment rates at American college and universities. Revised edition*. Los Angeles: Higher Education Research Institute, UCLA.
- Benner, A. D., & Graham, S. (2009). The transition to high school as a developmental process among multi-ethnic urban youth. *Child Development*, 80, 356–376.
- Berger, J. B., & Lyon, S. C. (2005). Past to present: A historical look at retention. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 1–29). Connecticut: Praeger Publishers.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Carter, D. F., Locks, A. M., Winkle-Wagner, R., & Pineda, D. (2006, April). "From when and where I enter": Theoretical and empirical considerations of minority students' transition to college. Paper presented at American Educational Research Association annual meeting, San Francisco.
- Chang, M. J. (1999). Does racial diversity matter? The educational impact of a racially diverse undergraduate population. *Journal of College Student Development*, 40(4), 377–395.
- Chavous, T., Rivas, D., Green, L., & Helaire, L. (2002). Role of student background, perceptions of ethnic fit, and racial identification in the academic adjustment of African American students at a predominantly white university. *Journal of Black Psychology*, 28(3), 234–260.
- Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendation for getting the most from your analyses. *Practical Assessment, Research and Evaluation*, 10, 1–9. Retrieved from <http://pareonline.net/pdf/v10n7.pdf>

- Davis, J. E. (1994). College in black and white: Campus environment and academic achievement of African American males. *Journal of Negro Education*, 63(4), 620–633.
- Davis, M., Dias-Bowie, Y., Greenberg, K., Klukken, G., Pollio, H. R., Thomas, S. P., et al. (2004). “A fly in the buttermilk”: Descriptions of university life by successful black undergraduate students at a predominately white southeastern university. *Journal of Higher Education*, 75(4), 420–445.
- Dawson, J. F., & Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression: Development and application of a slope difference test. *Journal of Applied Psychology*, 91, 917–926.
- Denton, M., Prus, S., & Walters, V. (2004). Gender differences in health: A Canadian study of the psychosocial, structural and behavioural determinants of health. *Social Science and Medicine*, 58(12), 2585–2600.
- Derogatis, L. R. (2001). *Brief Symptom Inventory (BSI)-18. Administration, scoring, and procedures manual*. Minneapolis, MN: NCS Pearson Inc.
- Fazio, N. M., & Palm, L. J. (1998). Attributional style, depression, and grade point averages of college students. *Psychological Reports*, 83(1), 159–162.
- Finch, B. K., & Vega, W. A. (2003). Acculturation stress, social support, and self-rated health among Latinos in California. *Journal of Immigrant Health*, 5, 109–117.
- Fries-Britt, S. L. (1998). Moving beyond black achiever isolation: Experiences of gifted black collegians. *Journal of Higher Education*, 69(5), 556–576.
- Gibbs, J. T. (1973). Black students, white university: Different expectations. *Personnel and Guidance Journal*, 51(7), 463–469.
- Gloria, A. M., Robinson Kurpius, S. E., Hamilton, K. D., & Willson, M. S. (1999). African American students’ persistence at a predominantly white university: Influences of social support, university comfort, and self-beliefs. *Journal of College Student Development*, 40, 257–268.
- Graham, C., Baker, W. R., & Wapner, S. (1985). Prior interracial experience and black student transition into predominantly white colleges. *Journal of Personality and Social Psychology*, 47(5), 1146–1154.
- Gurin, P. Y., Dey, E. L., Gurin, G., & Hurtado, S. (2003). How does Racial/Ethnic diversity promote education? *Western Journal of Black Studies*, 27(1), 20–29.
- Hughes, M. S. (1987). Black students’ participation in higher education. *Journal of College Student Personnel*, 28, 532–545.
- Hurtado, S., & Carter, D. F. (1997). Effects of college transition and perceptions of the campus racial climate on Latino students’ sense of belonging. *Sociology of Education*, 70(4), 324–345.
- Hurtado, S., Milem, J., Clayton-Pedersen, A., & Allen, W. (1999). Enacting diverse learning environments: Improving the climate for racial/ethnic diversity in higher education. *The Review of Higher Education*, 21, 279–302.
- Hysebegasi, A., Hass, S. L., & Rowland, C. R. (2005). The impact of depression on the academic productivity of university students. *Journal of Mental Health Policy and Economics*, 8, 145–151.
- Jones, J. M. (1997). *Prejudice and racism*. New York: McGraw-Hill.
- Jones, L., Castellanos, J., & Cole, D. (2002). Examining the ethnic minority student experience at predominantly white institutions: A case study. *Journal of Hispanic Higher Education*, 1(1), 19–39.
- Laanan, F. S. (2000). Community college students’ career and educational goals. In S. R. Aragon (Ed.), *Beyond access: Methods and models for increasing retention and learning among minority students*. *New Directions for Community Colleges*, no 112 (pp. 19–33). San Francisco: Jossey-Bass.
- Locks, A. M., Hurtado, S., Bowman, N. A., & Oseguera, L. (2008). Extending notions of campus climate and diversity to students transition to college. *Review of Higher Education*, 31(3), 257–285.
- Massey, D. S., & Fischer, M. J. (2006). The effect of childhood segregation on minority academic performance at selective colleges. *Ethnic and Racial Studies*, 29, 1–26.
- McEwen, M. K., Roper, L. D., Bryant, D. R., & Langa, M. J. (1990). Incorporating the development of African American students into psychosocial theories of student development. *Journal of College Student Development*, 31, 429–436.
- Mendoza-Denton, R., Downey, G., Purdie, V., Davis, A., & Pietrzak, J. (2002). Sensitivity to status-based rejection: Implications for African American students’ college experience. *Journal of Personality and Social Psychology*, 83, 896–918.
- Mounts, N. S. (2004). Contributions of parenting and campus climate to freshmen adjustment in a multi-ethnic sample. *Journal of Adolescent Research*, 19, 468–491.
- Mow, S. L., & Nettles, M. T. (1990). Minority student access to, and persistence and performance in college: A review of the trends and research literature. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 6, pp. 35–105). New York: Agathon Press.
- Nora, A., & Cabrera, A. F. (1996). The role of perceptions in prejudice and discrimination and the adjustment of minority students to college. *Journal of Higher Education*, 67, 119–148.
- Patton, L. D. (2006). The voice of reason: A qualitative examination of black student perceptions of black culture centers. *Journal of College Student Development*, 47(6), 628–646.
- Prelow, H. M., Weaver, S. R., Swenson, R. R., & Bowman, M. A. (2005). A preliminary investigation of the validity and reliability of the Brief-Symptom Inventory-18 in economically disadvantaged Latina American mothers. *Journal of Community Psychology*, 33(2), 139–155.
- Rankin, S. R., & Reason, R. D. (2005). Differing perceptions: How students of color and white students perceive campus climate for underrepresented groups. *Journal of College Student Development*, 46(1), 43–61.
- Reid, L. D., & Radhakrishnan, P. (2003). Race matters: The relation between race and general campus climate. *Cultural Diversity and Ethnic Minority Psychology*, 9, 263–275.
- Rendón, L. I., & Nora, A. (1994). Improving opportunities for minorities to transfer. In M. Justiz (Ed.), *Minorities in higher education* (pp. 120–138). Washington, DC: Oryx/American Council on Education.
- Robins, L., & Regier, D. A. (1991). *Psychiatric disorders in America: The Epidemiological Catchment Area Study*. New York: The Free Press.
- Ruble, D. N., & Seidman, E. (1996). Social transition: Windows into social psychological transactions. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 830–856). New York: Guilford Press.
- Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: Implications for theory and research. *American Psychologist*, 65, 237–251.
- Sedlacek, W. E. (1999). Black students on white campuses: 20 years of research. *Journal of College Student Development*, 40(5), 538–550.
- Seidman, E. (1988). Back to the future, community psychology: Unfolding a theory of social intervention. *American Journal of Community Psychology*, 16, 3–21.
- Seidman, E., & French, S. E. (2004). Developmental trajectories and ecological transitions: A two step procedure to aid in the choice of prevention and promotion interventions. *Development and Psychopathology*, 16, 1141–1159.
- Sherman, T. M., Giles, M. B., & Williams-Green, J. (1994). Assessment and retention of black students in higher education. *Journal of Negro Education*, 64(2), 164–180.

- Smith, W. A., Allen, W. R., & Danley, L. L. (2007). “Assume the position...you fit the description” psychosocial experiences and racial battle fatigue among African American male college students. *American Behavioral Scientist*, *51*, 551–578.
- Solórzano, D. (2000). Critical race theory, racial microaggressions, and campus racial climate: The experiences of African American college students. *The Journal of Negro Education*, *69*(1/2), 60–73.
- Solórzano, D. G., Ceja, M., & Yosso, T. J. (2001). Critical race theory, racial microaggressions, and campus racial climate: The experiences of African American college students. *Journal of Negro Education*, *69*(1–2), 60–73.
- Strange, C. C., & Banning, J. H. (2001). *Educating by design: Creating campus learning environments that work*. San Francisco: Jossey-Bass.
- Thompson, W. E., & Hickey, J. V. (2011). *Society in focus: An introduction to sociology* (7th ed.). New York: Longman.
- Tseng, V., & Yoshikawa, H. (2008). Reconceptualizing acculturation. *American Journal of Community Psychology*, *42*, 355–358.
- Turner, B., & Fries-Britt, S. (2002). Uneven stories: Successful black collegians at a black and a white campus. *The Review of Higher Education*, *25*(3), 315–330.
- Williams, D. R., & Mohammed, S. A. (2009). Discrimination and racial disparities in health: Evidence and needed research. *Journal of Behavioral Medicine*, *32*, 20–47.
- Witt, D. K. (2006). Health disparities in African American males. *Primary Care Clinics in Office Practice*, *33*, 35–43.