Health Psychology

ISSN: 0278-6133

2021, Vol. 40, No. 3, 155–165
https://doi.org/10.1037/hea0001056

Perceived Racial Discrimination and Healthy Behavior Among African Americans

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Objective: Numerous studies have found evidence of a link between perceived discrimination and unhealthy behavior, especially substance use. Within this body of literature, however, several studies have found unexpected evidence of a positive relation between perceived racial discrimination among African Americans—mostly women—and certain types of healthy behavior, primarily exercise and healthy eating. The current study further examined this positive relation, including an anticipated moderator: optimism. It also examined the relation between perceived racial discrimination and a correlate of unhealthy behavior: BMI. ***Method:*** Six waves of data were collected over 14 years in three related samples of African Americans from families participating in the Family and Community Health Study. Each family included an adolescent (M_{age} = 10.5 at Wave 1), the adolescent's primary caregiver (M_{age} = 37), and, in some cases, an older sibling of that adolescent (M_{age} = 13). Wave 1 *N*s were 889, 889, and 295, respectively. Healthy behavior was defined as diet and exercise. ***Results:*** There was very little evidence of a long-term relation between perceived racial discrimination and BMI in any sample, and no evidence of a relation between discrimination and healthy behavior among the males. However, correlational analyses revealed a positive prospective relation between discrimination and healthy behavior among all three groups of females; structural equation modeling indicated that this relation was stronger among women who were high in optimism. ***Conclusions:*** Perceived racial discrimination does not appear to be related to BMI among African Americans, but it is related to healthy behavior among Black females who are high in dispositional optimism.

Keywords: racial discrimination, optimism, healthy behavior, BMI

Supplemental materials: https://doi.org/10.1037/hea0001056.supp

One of the many harmful effects that perceived racial discrimination (PRD) has on African Americans is its impact on unhealthy behavior, especially substance use. Numerous survey studies have linked PRD with smoking, drinking, and drug use (Gibbons et al., 2012; see Pascoe & Richman, 2009, for a review). This relation maintains controlling for the impact of low SES, which is also a predictor of unhealthy behavior (Williams et al., 2019). Similar results have been found among Black adolescents and young adults in experimental studies involving manipulations of discrimination and their effect on willingness to use substances (e.g., Gibbons et al., 2010; Stock et al., 2013). One result of this line of research is that discrimination is increasingly being identified as a significant contributor to the major disparities in health status that exist between Whites and Blacks in the U.S. (Williams et al., 2019). Recognition of the impact of PRD has resulted in calls for more research examining factors that might affect the relation between PRD and health behavior (Jones et al., 2019; Priest & Williams, 2018).

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Support for this research came from National Institute on Drug Abuse Grants DA021898 and DA018871, National Institute of Mental Health Grant MH062668, and National Cancer Institute Grant CA220254.

Frederick X. Gibbons served as lead for conceptualization, funding acquisition, investigation, writing—original draft and editing; contributed equally to project administration, and served in a supporting role for formal analysis. Meg Gerrard contributed equally to methodology and served in a supporting role for writing—review and editing. Mary E. Fleischli served as lead for formal analysis, contributed equally to data curation, and served in a supporting role for writing—review and editing. Ronald L. Simons contributed equally to project administration and served in a supporting role for writing—original draft. John H. Kingsbury served in a supporting role for writing—original draft.

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Toward that end, a number of studies, including several from the Family and Community Health Study (FACHS), have examined mediators of the association between PRD and unhealthy behavior. Most of these studies have reported that affective reactions to PRD are a central factor (Gerrard et al., 2012). Not surprisingly, PRD increases negative affect, both internalizing (anxiety and depression) and externalizing (hostility and anger; Gibbons et al., 2014; Gibbons et al., 2010), and both types of negative affect can, in turn, increase the likelihood of engaging in unhealthy behavior (Trudel-Fitzgerald et al., 2016). Gerrard et al. (2018) reported the same mediation pattern (also in the FACHS sample), and found evidence of moderation: The PRD-to-substance-use relation was significantly stronger for those who had previously indicated they engage in forms of avoidant coping (e.g., ignoring the problem). Consistent with earlier speculation, Gerrard et al. (2018) concluded that the substance use was a type of coping response that can mute the negative affect produced by the discrimination.

PRD and Health Behavior: Long-Term Versus Short-Term Reactions

In general, Black adolescents report engaging in more unhealthy eating than do White adolescents (Centers for Disease Control and Prevention, 2016) and less exercise (Centers for Disease Control and Prevention, 2017), and there is evidence that PRD may play a role in these differences as well. Acute (short-term) reactions to discriminatory experiences have been linked with unhealthy eating, perhaps as an emotion-focused coping mechanism in response to the experience (Kelly et al., 2018). For example, in an experimental study using the "cyberball" paradigm, PRD in the form of social exclusion by White women was associated with more interest in eating unhealthy food among Black women (Hayman et al., 2015). Similar results by Pascoe and Richman (2011) led them to suggest that individuals may eat "comfort" (i.e., high-caloric, high-fat) foods as a means of coping with the negative emotions that were evoked by the discriminatory experience (see also Talleyrand et al., 2017). In fact, research has indicated that such foods instigate a physiological process that helps to reduce stress hormone responses in both humans and animals (Cozier et al., 2009).

Pascoe and Richman (2011) also pointed out that the long-term impact of PRD on unhealthy eating is less clear. Over time, inactivity and poor diet are associated with weight gain (Livingston & Zylke, 2012), and a number of studies have shown a positive relation between PRD and BMI. However, many of these studies were cross-sectional and so could not effectively address the short- versus long-term distinction, nor identify any possible causal relations. Moreover, a significant number of studies have not found this positive relation. Hunte and Williams (2009) reported a correlation between perceived discrimination and body fat for some ethnic groups (Jews, Italians, Poles), but not for non-Hispanic Blacks. Among Black women enrolled in a weight control study, Johnson et al. (2012) found a correlation between PRD and eating to manage stress, but there was no PRD/BMI relation (see also Shelton et al., 2009). Moreover, a few studies have found a negative PRD/BMI relation (e.g., Vines et al., 2007). In short, it appears that long-term health–behavior reactions to PRD may differ from short-term reactions. In fact, previous efforts to examine the intuitive health consequences of PRD—that is, increases in unhealthy behavior—have produced evidence of long-term positive relations between PRD and certain healthy behaviors (HBs).

Borrell et al. (2013) found that African Americans who said they had experienced moderate or high levels of discrimination in the past indicated they used more substances than did those reporting less PRD, but they also reported being more physically active. The relation maintained when controlling for neighborhood segregation and SES, as well as individual SES, all of which are predictors of exercise (Denton et al., 2014). The authors suggested that this physical activity—like substance use—may be one way these individuals cope with the PRD stress (see Sims et al., 2017). Several other studies have shown similar positive relations. Perceived lifetime racism was associated with higher levels of substance use in the Black Women's Health Study, but it was also associated with a "prudent" dietary pattern and vigorous physical activity, and it was not related to BMI (Cozier et al., 2014). In Corral and Landrine (2012), PRD was again positively associated with physical activity among a sample of Black adults. Similarly, Forsyth et al. (2014) examined change in exercise and diet among those enrolled in the Counseling African Americans to Control Hypertension (CAATCH) trial, and found that PRD was correlated positively with physical activity and negatively with healthy diet at the start of the trial, but then PRD predicted significantly greater improvement in diet by the end of the trial.

These positive PRD/health-behavior relations are counterintuitive and, in most cases, were not anticipated by the researchers. One element in the PRD literature does provide some explanation, however. Lalonde and Cameron (1994) have asserted that African Americans may respond to racial discrimination experiences by trying to improve themselves—that is, working harder in an effort to overcome the constraints imposed by the discrimination. They suggest this self-improvement is an "active, normative, and self-directed" response to PRD. Sanders (1997) found evidence of a similar process in African American adolescents, who responded to PRD by increasing their academic effort. The current study further examines this positive relation between PRD and HB (exercise and healthy eating), including a factor thought to moderate this relation: optimism.

Moderation of the PRD/HB Relations

Assuming that self-improvement is a motive for this healthy reaction to PRD, and given the typical amount of time between healthy behaviors (e.g., exercise and eating well) and their various outcomes, one might expect that some form of positive focus on the future would be a predictor of such behaviors. In fact, optimism has been linked with a variety of healthy behaviors, including good diets, for example, fruit and vegetable consumption (Ronaldson et al., 2015) and more physical activity (Ronaldson et al., 2015). This optimism/HB relation has also been found among African Americans (Sims et al., 2019) and elderly persons (Steptoe et al., 2006). More generally, an extensive series of studies by Scheier and Carver and colleagues has shown that optimism is associated with healthier behaviors, more future orientation, and more adaptive responses to stress—including *proactive stress coping* (Carver et al., 2010; Scheier et al., 2001; see also Aspinwall & Taylor, 1997).

Gender also appears to be an important moderating factor for the PRD/HB relation. In Steptoe et al. (2006), the positive impact

of optimism on physical activity was seen among the elderly women but not the elderly men (see also Kahana et al., 2005). Brodish et al. (2011) found that self-reported PRD experienced during mid to late adolescence was associated with less healthy eating for Black males at age 30, but not Black females (see Kelly et al., 2018). Instead, higher reports of PRD were associated with more physical activity for the females. The same pattern appeared in Sims et al. (2016): PRD was associated with more physical activity for the Black women but not the Black men. This "unexpected" finding led these authors to call for additional research on the topic.

Objectives and Hypotheses

The current study further examined the relation between PRD and HB in the FACHS sample. With multiple waves of PRD and HB data from members of almost 900 Black families, FACHS is particularly appropriate for such an examination. The study is also consistent with the goals of the American Psychological Association's (2018) Resilience Initiative intended to help Black adolescents effectively cope with racism—racism that can negatively affect their health. More specifically, the current study assessed a) the relation between PRD and BMI in three related samples of African Americans, b) gender differences in the relation between PRD and HB in the same samples, and c) moderation of the anticipated PRD/HB relation by optimism. This moderator was chosen because it has been linked with PRD reactions and HB in multiple previous studies, and because it is modifiable (see below) and so has translational significance.

There were two hypotheses about the PRD/HB relation. H_1: It will be moderated by gender: that is, positively related for the females, but unrelated for the males. H_2: It will also be moderated by optimism, that is, it will be stronger for those females—adolescents and adults—who are high in optimism. In contrast, and consistent with the assumption that unhealthy eating and avoidance of exercise are acute and not chronic reactions to PRD, no PRD/BMI relation was anticipated in any of the subsamples.

Method

Sample, Recruitment, and Procedure

Sample

Data were collected from three different groups, all of which were subsamples in the Family and Community Health Study. FACHS is an ongoing panel study of psychosocial factors that affect the mental and physical health of African Americans. The original (W1) FACHS sample comprised 889 Black families who lived in Iowa or Georgia ($\sim$ 50% in each state). Each family had an adolescent ("target") with a *M* age at W1 of 10.5 (*SD* = .6, range: 9–13), and their primary caregiver (PC) with a *M* W1 age of 37 (*SD* = 8.0; range: 23–81). At W1, there were 411 male and 478 female targets, and 58 male and 831 female PCs. Most of the 889 PCs (84%) were the targets' biological mothers; the rest were fathers, grandmothers, and so forth; 55% were single mothers. The targets and PCs were the two focal subsamples. In addition, one third of the families had a sibling (sib) one to three years older than the target who participated (*M* age = 13; *SD* = .8; range: 12–15). W1 *N*s for that subsample were 153 males and 170 females.

Recruitment

Families were recruited from 259 block group areas that varied in terms of racial composition. Sites included small metropolitan areas and suburbs with mostly lower/middle-class families. School liaisons and community coordinators compiled lists of all families in their areas that included a fifth-grade Black child. Potential participant families, chosen randomly from the lists, received an introductory letter, followed by a recruitment call. Complete W1 data were gathered from 72% of the families on the lists. Those who declined to participate usually cited the amount of interview time (up to 3 hr per respondent per wave) as the reason. The sample was representative of the demographic: Black families in lower/middle SES, nonurban neighborhoods in Iowa and Georgia.

Procedure

All interviewers were African American, and most lived in the same communities as the participants. They received $\sim$40 hr of interview training. Interviews were conducted in families' homes or nearby locations and required two interviewers and one or two visits per wave. Questions were presented using the Computer Assisted Personal Interview (CAPI) technique. Compensation ranged from $70 (W1) to $150 (W6) for the targets, $100 to $115 for the PCs, and $30 to $75 for the sibs. Data collection began in 1997. Average time between interviews was 24 months for W1–W2; 36 months for W2–W3, W3–W4, and W4–W5; and 26 months for W5–W6. Sample retention was excellent: 79% of the W1 targets and 76% of the W1 PCs completed the W6 interview (13 or 14 years later). PCs provided informed consent at each wave of data collection. Assent was obtained from the adolescents at each wave until age 18; after that, informed consent was obtained from them. Procedures were approved by the following IRBs: University of Connecticut, University of Georgia, University of Iowa, and Iowa State University. For additional information on the sample and its recruitment, see Gibbons et al. (2004).

Measures

The first set of preliminary analyses with the three subsamples included PRD, BMI, and the outcome, HB. The primary analyses included a fourth variable, optimism, as a moderator. Table 1 presents the four primary measures available by wave of measurement, subsample, and analysis.

PRD

PRD was the same for all participants: a 13-item modified version of the Schedule of Racist Events (Landrine & Klonoff, 1996). This measure (often used to assess PRD; Pascoe & Richman, 2009) describes various discriminatory events and asks respondents how often in their life they have experienced each type of event because of their race, for example, "How often has someone said something insulting to you just because you are African American?" (from 1 = *never* to 4 = *several times;* αs for all waves $>$.85). Modifications for the adolescents included minor revisions of the vocabulary.

Table 1
Measures Available by Wave (Year of Data Collection) and Subsample

Measure	Subsample	W1 (1998)	W2 (2000)	W3 (2003)	W4 (2006)	W5 (2009)	W6 (2011)
PRD	PCs (M_{age} = 37)	Y	Y	Y	X	Y	Y
	Targets (M_{age} = 10.5)	Y	Y	Y	X	Y	Y
	Sibs (M_{age} = 13)			Y	Y	Y	Y
OPT	PCs	Z	Z	X	Z	Z	Z
	Targets	Z	X				
	Sibs						
BMI	PCs						Y
	Targets	Y	Y		Y	Y	Y
	Sibs					Y	Y
HB	PCs				X	X	X
	Targets			X	X	X	X
	Sibs			Z	Y	Y	Y

Note. Years for each wave (in parentheses below the wave number) are the year the surveys were completed; waves took ~ 16–18 months to complete. M_{age} = *M* age of subsample at W1; X = measure used in primary (SEM) analyses; Y = measure used in correlational analyses (PRD-BMI and/or PRD-HB) only; Z = measure available, but not used in analyses; PCs = primary caregivers; Sibs = siblings; PRD = perceived racial discrimination (lifetime); OPT = optimism (moderator of PRD/HB relation); HB = healthy behavior in the last week.

Optimism

There were two versions of the optimism moderator, both modifications of the Scheier and Carver (1985) LOT scale. For the PCs (at W3), the scale included eight items, four positively worded, for example, "You are always optimistic about your future," and four negatively worded, for example, "You hardly ever expect things to go your way" (reversed), from 1 = *strongly disagree* to 4 = *strongly agree* (α = .75). For the targets, optimism at W2 (the last wave at which it was assessed) was used as the moderator. Due to scale reliability, however, only the four positive items were used in the target analyses (α = .69).[1]

Outcome

The HB scale came from the National Longitudinal Survey for Youth (see Jayawardene et al., 2016; also August & Sorkin, 2011), and was the same for all participants. It had two self-reported components: diet and exercise. HB scales that include both diet and exercise measures like these are common in the health literature; these studies have typically shown that the two types of healthy behavior covary (e.g., Brodish et al., 2011; Centers for Disease Control and Prevention, 2007). The benefits of these two healthy behaviors are described in *Healthy People 2020* (Office of Disease Prevention and Health Promotion, 2018). Both have been linked with positive health outcomes—for example, reduced cardiovascular risk (Appel et al., 2003). Also, studies have shown that interventions that target both behaviors are more effective than those targeting either one alone in terms of weight loss (Johns et al., 2014), physical functioning among the elderly (Villareal et al., 2011), and pain reduction (Messier et al., 2013). Diet was assessed with two items: "During the past 7 days, how many times did you eat . . ." "a) a whole piece of fruit (e.g., an apple, orange or banana) or drink a glass of 100% fruit juice (do not count punch, Kool-Aid, or sports drinks)?" and "b) vegetables like green salad, carrots or potatoes (do not count French fries, fried potatoes, or potato chips)?" Scales ranged from 1 = *none* to 5 = *twice a day (or more)*. Exercise was also assessed with two items: "On how many of the past 7 days did you exercise or participate in physical activity for at least 30 minutes that . . ." "(a) made you breathe hard (such as basketball, soccer, running, or riding a bicycle hard)?" and "(b) did not make you breathe hard, but was still exercise (such as fast walking, slow bicycling, skating, pushing a lawn mower, or doing active household chores?)"[AQ5] This scale ranged from 1 = *0 days* to 5 = *all 7 days*.

Covariates

PCs' SES (self-reported education level and family income), neighborhood percentage Black families (from the census), and respondents' BMI were used as covariates in the PC and target HB analyses, because they have all been related to HB (e.g., Denton et al., 2014). In addition, neighborhood percentage Black and state of residence were included as covariates because they were related to PRD (e.g., more PRD in Iowa). PCs' age was also covaried in their HB analyses because it is related to exercise level (Centers for Disease Control and Prevention, 2017) and because of the large age range in the PC sample. BMI came from self-reported height and weight for the sibs, and for the targets in W1, W2, and W4 (there was no W3 measure). For the PCs, and the targets at W5 and W6, height and weight were measured by field staff, using scales. W4 BMI (BMI4) was used for the targets. PC BMI at W6 (BMI6, the only wave at which it was measured) was used for the PCs. In addition, BMI was included as an outcome in the first set of correlational analyses.

[1] Alphas for just the four positively worded items and for the full 8-item scale were very similar for the PCs (αs = .76 v .75), but not for the targets (4-item scale α = .69 v. full scale α = .54). This reflected the fact that the positively worded items and the (reverse-coded) negatively worded items were positively correlated for the PCs: $r(760) = .28$ ($p < .001$), but not for the targets: $r(772) = -.02$ ($p > .57$). Response effects like this—in which young adolescents respond consistently to same-valenced items in a scale, but inconsistently to scale items with positive vs. negative wording, but similar meaning—are not uncommon (Ye & Wallace, 2014). Consequently (as suggested by Marsh, 1996), just the positively worded items were used for the targets. Optimism was not assessed with the sibs.

Table 2
Means (SDs) for BMI at W6 and Means (SDs) and ns for PRD and HB at W4

Measure	Statistic	Gender	Subsample		
			Adolescents	PCs	Total
BMI	Means (SDs)	Males	27.53 (7.08)	31.45 (8.31)	27.90 (7.28)
		Females	30.25 (8.39)	33.66 (8.04)	32.10 (8.38)
	gender difference t-test		−5.17***	−1.60	−9.51***
PRD	Means (*SDs*)	Males	1.83 (.64)	1.86 (.70)	1.84 (.64)
		Females	1.73 (.55)	1.82 (.65)	1.78 (.61)
	gender difference t-test		2.62**	.38	1.63
HB	Means (*SDs*)	Males	2.95 (.83)	2.81 (.75)	2.94 (.82)
		Females	2.69 (.86)	2.72 (.81)	2.71 (.83)
	gender difference t-test		4.77***	.74	5.06***
	*n*s	Males	416	49	465
		Females	532	689	1,221

Note. Adolescents = targets and siblings; PCs = primary caregivers; Total = combination of all three subsamples; PRD = perceived racial discrimination (lifetime); HB = healthy behavior in the last week.
** $p < .01$. *** $p < .001$.

Results

Overview

The first set of analyses examined the correlations between PRD and BMI, each assessed at multiple waves. The second set of analyses assessed synchronous correlations (by gender) between W4 PRD and HB. W4 was chosen because it was the first wave that HB was available for all subsamples, and prior to age 18, HB varies due to external factors; for example, parents' influence on diet (especially among Black mothers; Ahye et al., 2006) and school influence on exercise (Story et al., 2009).[2] The primary analyses, conducted with the female targets and PCs, used structural equation modeling (SEM) to examine the relations between PRD and HB (not BMI), with moderation by optimism. HB was assessed at Waves 4, 5, and 6 for the PCs and the targets. These waves were then combined (HB456; 12 items total; αs = .73 for the targets and .65 for the PCs). Multiple waves were used because the timeframe for the HB items was only the previous seven days (so combining waves provided more information about the behavior).

Means, Correlations, and Gender Differences for Central Constructs

Because of their similar ages, the targets and sibs (hereafter "adolescents") were combined by gender for the correlation analyses.[3] This also allowed for comparisons of PRD effects across two different generations: parents and their children. For the final correlational comparisons (male v. female), to increase sample size, all three subsamples were combined by gender.

Means

W6 mean BMIs are presented in Table 2, along with the W4 means for PRD and HB by gender. Among the adolescents (targets and sibs combined), the males had lower BMI ($p < .001$), higher PRD4 ($p < .01$), and higher HB4 ($p < .001$). The last was due solely to the fact that the males were higher on exercise ($p < .001$); there were no significant gender differences in diet ($p > .39$).

Correlations: PRD and BMI

PCs' and adolescents' reports of W4 PRD (PRD4) were correlated: $r(800) = .14$ ($p < .001$). At W6, the PCs' and adolescents' BMI scores were also correlated: $r(633) = .26$ ($p < .001$). For just the females, the BMI6 correlation was $r(352) = .35$ ($p < .001$). As expected, however, there was little evidence of a consistent relation between PRD and BMI. These correlations were examined for all available waves for the PCs, targets, and sibs separately by gender (i.e., six groups). There was a total of 62 correlations in which PRD was measured before or synchronously with BMI. Of that group, 26 correlations were nonsignificantly negative ($ps > .10$), 31 were nonsignificantly positive ($ps > .10$), and three were marginally positive ($.10 > p > .05$). Only two were significantly positive: For the female targets, PRD4 was correlated with BMI at W4 and W5: $r(388) = .13$ and $r(356) = .12$ (both $ps < .03$). Nonetheless, because some participants undoubtedly experienced discrimination that was based at least partly on their weight (Puhl et al., 2008), BMI was included as a covariate in the models.

Gender Differences in the PRD/HB Relation

Table 3 has the W4 PRD/HB correlations and confidence intervals for the adolescents and the PCs, first separately, then combined by gender. With this sample size, power to detect a gender difference in the correlations (at $\alpha < .05$) was high: .88 for the total sample, .98 for the adolescents. As expected (H_1), none of the subsample correlations were significant for the males (all three $ps > .45$). In contrast, for the females, the PRD/HB correlations were positive and significant for the adolescents: $r(530) = .19$ ($p < .001$), and marginal for the PCs: $r(687) = .07$ ($p = .08$). For the total sample combined by gender, the females' correlation was

[2] In multi-sample/multi-wave studies, wave choice can be complicated. Choices were based partly on measure availability (e.g., BMI was not available for the PCs until W6; W4 was the first time all participants were asked about their PRD and HB; target optimism was not assessed after W2). Another determining factor was temporal—i.e., moderators coming before the moderated measures (e.g., optimism before HB).

[3] The targets' and sibs' responses were also similar; e.g., in both cases, the males had higher HB, and the females had significant positive PRD4/HB4 correlations, whereas the males did not.

$r(1219) = .12$ ($p < .0001$) versus $r(463) = -.03$ ($p > .47$) for the males. These two pairs of correlations differed significantly: z = 2.76 ($p < .006$) for the total groups, and z = 3.39 ($p < .001$) for the adolescents. PRD4 also predicted HB456 for the female adolescents, $r(530) = .17$ ($p < .001$), and the female PCs: $r(687) = .09$ ($p < .02$). Neither of these correlations was significant for the males: adolescents, $r(414) = .04$; PCs, $r(47) = -.17$ (both $ps > .22$).

Family Effect

To account for the random effect of the family unit (i.e., targets, sibs, and PCs being nested within a family), a mixed-model regression with a random intercept for family was run on the family members' HB4. HB4 was significantly predicted by the family members' PRD4: β = .16, 95% CI [.08, .23], t = 4.04 ($p < .001$), and as expected (H_1), PRD4 interacted with gender: β = –.21; 95% CI [–.34, –.07], $t = -2.92$ ($p = .004$). Thus, controlling for the family connection, the PRD/HB relation was significant for just the females. Consequently, the remaining results are for just females (targets and PCs).

SEMs: Measurement Models

The female target and PC SEMs included three key latent constructs (see Figures 1 and 2). PRD4 had three randomly assigned parcels of items as indicators; target W2 optimism (Opt2) had the four optimism questions as indicators; PC W3 optimism (Opt3) had three parcels of questions as indicators; and HB456 had three indicators: HB4, HB5, HB6, each of which was also a latent construct with the four questions as indicators. The residuals for the four HB questions were correlated with the same questions measured in different waves. Additionally, to control for modeling effects, in the target model, the PCs' HB456 was included as a predictor; it had the same variable structure as the targets. In the PC model, the targets' HB456 was included as a predictor (this time to control for adult child to parent modeling effects). All of the covariates were manifest. The interaction of PRD4 and Opt2 or Opt3 was modeled using latent moderated structural equations, which produce a single latent interaction term (Maslowsky et al., 2015). The SEMs used maximum likelihood estimation with robust standard errors, with 5,000 iterations for the measurement models and numerical integration for the latent interaction models, and FIML to handle missing values (MPlus, V.8.4; Muthén & Muthén, 2019). For the measurement models, all constructs were allowed to correlate. The target model was identified with more observations (665) than free parameters (147). Model fit was good: χ^2: *df* ratio < 1.36, CFI and TLI > .91, RMSEA < .03. The PC model was also identified with more observations (665) than free parameters (154). The measurement model fit was acceptable: χ^2: *df* ratio = 1.95, CFI and TLI ≥ .89, RMSEAs < .03.[4] Correlations for all SEM constructs are provided in the online supplemental materials.

SEMs: Moderation of PRD to HB by Optimism

Targets

The first model (see Figure 1) included a direct path (main effect) from the PCs' HB456 to their daughter's HB456: β = .24, z = 2.31 ($p = .02$). The optimism main effect was not significant: β = .10, z = 1.26 ($p < .22$). However, the direct path from the targets' PRD4 to their HB456 was significant: β = .23, z = 2.96 ($p = .003$). Also, consistent with H_2, the Opt2 × PRD4 interaction term was significant: β = .21, z = 2.44 ($p = .01$). The R^2 increased from .08 to .21 when the PRD4 main effect and the Opt2 × PRD4 interaction terms were added to the model. Thus, the relation between PRD and HB was significant, and that relation was stronger the higher the participant's level of optimism. For the male targets, the PRD4 and Opt2 main effects, as well as the PRD4 × Opt2 interaction, were not significant (all $ps > .50$).

Change in Target HB

Given the lability of adolescent HB, SEMs were also run on HB456, again controlling for PC HB456, but this time also controlling for previous target HB (HB3). Results looked very similar to those without HB3, in spite of the fact that HB3 was strongly related to HB456: β = .47, z = 5.55 ($p < .0001$). The direct path from PC HB456 became marginal ($p = .07$). The PRD4 to HB456 path remained significant, however: β = .17, z = 2.27 ($p = .02$), as did the Opt2 × PRD4 interaction path: β = .17, z = 2.11 ($p = .03$). In short, PRD by itself, and together with optimism, predicted change in target HB during an important developmental period: age ∼15 to early adulthood (ages 18 to 24).

PCs

The same procedure used with the targets was used to examine moderation for the PCs (see Figure 2). The main effect of Opt3 was significant: β = .16, z = 2.26 ($p = .02$), as was the direct path from PRD4 to HB456: β = .18, z = 2.93 ($p = .003$). As expected (H_2), the path from PRD4 to HB456 was again moderated by optimism; the Opt3 × PRD4 interaction term was: β = .13, z = 2.10 ($p < .04$). The R^2 increased from .16 to .25 when PRD and the interaction term were added to the model. In sum, optimism appeared to promote healthy behavior overall and healthy reactions to PRD among women.

Discussion

A number of studies have uncovered unexpected evidence of a positive relation between PRD and healthy diet/exercise, but this is the first systematic study of these relations (over an extended period of time) that we are aware of, and the results offer some encouragement. More specifically, the current analyses provide evidence of a different health behavior reaction to PRD by a particular group of African Americans from the FACHS sample: The female PCs and their daughters—especially those who are high in optimism—appeared to respond to PRD experiences with more healthy behavior, and that included increases over time in HB for the daughters. This PRD reaction maintained controlling for a

[4] Missing values from attrition after W1 were: female targets ≤ 17%, female PCs ≤ 21%. Means of the measures for attritors and those who were still in the sample at W6 were compared using t-tests. For the targets, there were no significant differences. For the PCs, attritors were older and had lower optimism; no other measures had significantly different means. For the targets and PCs, all variables had reasonable skew and all but two covariates had reasonable kurtosis. For both groups, the square root of PRD was taken to reduce the slight right skew.

Table 3
Synchronous Correlations [95% CI] and ns of PRD and HB at W4

Statistic	Gender	Subsample		
		Adolescents	PCs	Total
Correlations [95% CI]	Males	−.03 [−.13, .06]	−.03 [−.31, .25]	−.03 [−.12, .06]
	Females	.19*** [.11, .27]	.07† [−.01, .14]	.12*** [.06, .17]
Gender difference z		3.39***	.51	2.76**
ns	Males	416	49	465
	Females	532	689	1,221

Note. Adolescents = targets and siblings; PCs = primary caregivers; Total = combination of all three subsamples; PRD = perceived racial discrimination (lifetime); HB = healthy behavior in the last week.
† $p = .08$. ** $p < .01$. *** $p < .001$.

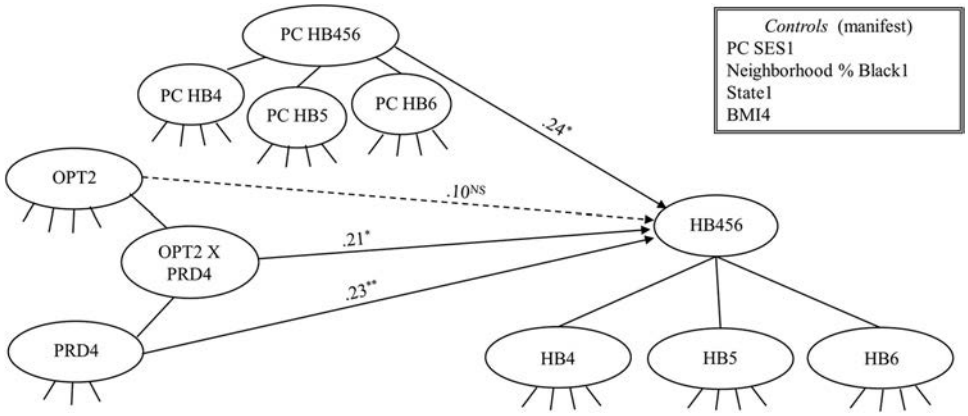
number of covariates that have been linked with HB in the past, including SES, BMI, neighborhood segregation, and parental modeling. Moreover, these (lifetime) PRD experiences reported at W4 (age 18 for the daughters, age 45 for their PCs) reflect two different developmental periods and potentially very different PRD experiences (Gee et al., 2012). The fact that reactions to these PRD experiences were very similar for the mothers and their daughters suggests that these positive PRD/HB relations are reliable.

The moderation by optimism can provide some indication of why PRD and HB were related among these women. First, numerous studies have shown that optimism (the general expectancy that the future will work out favorably) is influential in promoting proactive coping (Aspinwall & Taylor, 1997; Scheier et al., 2001), and also sticking with that active response, even when it is difficult to do so (Carver et al., 2010). One reason for this has to do with self-efficacy: Optimists are more likely to believe that they actually can engage in effective coping behaviors. This contrasts with the avoidant coping strategies in response to PRD reported by some of the FACHS PCs in Gerrard et al. (2018). Optimists are also more likely to believe that proactive coping (e.g., healthy behavior) will be effective at improving their health (Carver et al., 2010). Thus, optimistic Black females who have experienced discrimination may engage in healthy behavior because they believe that it will help them cope with the discrimination, and also improve them (see Lalonde & Cameron, 1994, mentioned earlier). In short, there are several reasons why optimistic females may have responded to PRD in the manner they did in this study; further examination of the motivation behind this healthy response should be a focus of future research.

Ironically, there is some evidence that this type of increased effort—when carried to an extreme—could have iatrogenic effects among African Americans. Some studies have shown that overcompensating for stressors, including racism (referred to as the "John Henryism" effect), can lead to more stress-related physical-health problems, such as increased cardiovascular risk (Volpe et al., 2020). We did not see any evidence of overcompensation in our data; it is, however, a caveat worth noting.

Consistent with cultural norms and previous research on comfort food consumption by African Americans (Hayman et al., 2015; Pascoe & Richman, 2011), it is likely that some of these women may have reacted initially to discriminatory experiences with a form of short-term emotion-focused coping that included using substances (Gerrard et al., 2018) and/or eating unhealthy

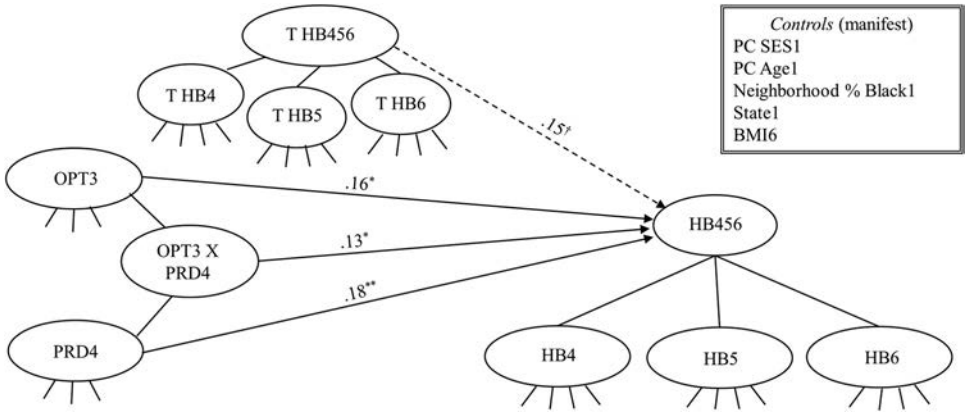
Figure 1
SEM: Moderation of PRD Effects on Healthy Behavior by Optimism for Female Targets



Note. All coefficients are standardized. Number after variable name indicates wave of data. SEM = structural equation modeling; PRD = perceived racial discrimination; HB = healthy behavior; OPT = optimism; OPT × PRD = the interaction of PRD and OPT.
* $p < .05$. ** $p < .01$.

Figure 2

SEM: Moderation of PRD Effects on Healthy Behavior by Optimism for Female PCs



Note. All coefficients are standardized. Number after variable name indicates wave of data. SEM = structural equation modeling; PRD = perceived racial discrimination; HB = healthy behavior; OPT = optimism; OPT × PRD = the interaction of PRD and OPT.

† $p < .08$. * $p < .05$. ** $p < .01$.

food. However, we found no indirect evidence—-in terms of elevated BMI—that this latter type of response persisted over time for any of the FACHS subsamples, males or females. Of course, many factors contribute to obesity; but, if overeating and inactivity were chronic reactions to PRD, given the amount of discrimination reported by the FACHS participants (Gerrard et al., 2012), it seems likely that there would have been some evidence of a positive relation with BMI (see Dallman et al., 2003). That was not the case. It appears that one reason why PRD and BMI are not related (over time) is because PRD can lead to healthier behavior. Once again, the similarity in the correlation pattern (PRD with BMI) between the two generations (mothers and their daughters) provides evidence of reliability of this (non)relation.

The question remains why a number of studies have found positive relations between PRD and BMI. Given the current pattern of results, it is not clear why that is the case. One possibility is that weight gain may be a corollary of other more chronic PRD coping responses, such as substance use. Or it may be that participants in previous studies have conflated weight-based discrimination with PRD. It is also possible that studies not finding a PRD/BMI relation are less likely to be published (i.e., a "wastebasket" or feature positive effect—both of which would suggest underreporting of null-hypothesis results). A finding from one of the experimental studies of PRD mentioned earlier (using the social exclusion "cyberball" paradigm) may also provide some insight. Hayman et al. (2015) reported that Black women ate more unhealthy food after being excluded by White women than by other Black women. However, these excluded Black women also reported being more emotionally distressed after exclusion by other Black women. This suggests that the long-term effects of PRD—from Whites—may have less of a negative impact than same-race discrimination among African Americans. This also is an important issue that is worthy of future empirical attention.

Translation

The most direct way to address the issue of health disparities in the U.S. would be to reduce discrimination. Unfortunately, reductions in discrimination have been slow in coming (see Dovidio et al.'s, 2018, discussion of aversive racism); in fact, recent surveys suggest that Black adolescents—and others, including Black adults and other minorities—believe racial discrimination in the U.S. may be getting worse (Horowitz et al., 2019). The same is true for the health disparities associated with PRD (Priest & Williams, 2018). In this respect, Forsyth et al. (2014) found that the CAATCH intervention, which included discussion of PRD experiences along with patient education about healthy lifestyles, was effective at countering the negative impact the discrimination apparently had on their unhealthy diets. Moreover, many interventions have been designed specifically to improve the diets and/or activity levels of Black adolescents. These interventions have produced mixed results, at best. Nonetheless, we believe efforts to design and implement such interventions should continue.

The current results suggest another translational approach, however. There is some evidence that optimism can be effectively increased by intervention (Malouff & Schutte, 2017). An important component of such an intervention for Black adolescents would be its impact on attributions for the discrimination—that is, more to the perpetrator and less to the self. An example is the Penn Resiliency Program, which includes efforts to reduce adolescents' tendencies toward self-blame for negative experiences (Yu & Seligman, 2002). The Penn Program has been shown to increase optimism in adolescents and also reduce depression—which is another antecedent to unhealthy behavior. Such programs may have potential for increasing healthy reactions (proactive coping) and also reducing unhealthy reactions to PRD in Black adolescents. Along similar lines, interventions like the Strong African American Families Program (Brody et al., 2006; Gerrard et al., 2006); which includes informing Black adolescents that unhealthy behaviors like substance use are not typical of Black adolescents,

may not only counter any tendency to link being Black with unhealthy behavior (Oyserman & Fisher, 2018), but may also increase the optimism shown to have salutary effects in the current study.

Limitations and Future Directions

There are several limitations to this study that should be identified. First, two of the primary measures—PRD and HB—were the same for all participants, but the other primary measure (optimism) varied for the PCs and targets (see Footnote 1). Second, the HB measure had only four items and provided an assessment of only two types of healthy behavior. This reduces the extent to which the current results can be compared with other similar studies; replications using scales with more HB items and other kinds of healthy behavior are called for. Third, the BMI measure was not uniform across subsamples, being both measured and self-reported. Its reliability (when self-reported) may have been low for the targets in earlier waves. Also, although BMI is widely used as an indicator of body fat, it is only one such measure. In fact, other types of body fat (e.g., visceral) have been linked more closely with outcomes such as cardiovascular disease (Lewis et al., 2011). Future studies should include different measures and different types of body fat. Similarly, this study only examined one type of discrimination (racial) among one minority group, Blacks– who report higher levels of PRD than any other racial/ethnic group (Horowitz et al., 2019). The healthy reaction to that discrimination found in this study may not be as common within other racial or ethnic groups and also may not be a typical response to other types of discrimination—for example, "everyday" or weight-based discrimination. Finally, future research should further examine the gender difference found in this study, specifically addressing a question not answered here: Why Black males do not engage in the same kind of healthy reaction to PRD evidenced by Black females?

The current research found very little evidence of a long-term relation (in this case, up to 15 years) between PRD and BMI. This is consistent with a belief that unhealthy eating (e.g., comfort food), linked previously with PRD in some studies, is a time-limited response to that PRD and not a long-term habitual reaction. In fact, the current results suggest that Black women who are high in optimism respond to PRD by engaging in more healthy behavior—evidence of a healthy and proactive coping style.

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Received December 9, 2019
Revision received October 22, 2020
Accepted October 26, 2020 ■