Do Poor Health Behaviors Amplify or Diminish the Association between Stress and Mental Health? An Empirical Examination of the Environmental Affordance Model

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ABSTRACT

In epidemiological studies, Blacks report poorer physical health but similar or lower rates of clinically diagnosed mental disorders than Whites. The Environmental Affordance (EA) model was developed to explain this "paradox." EA posits that Blacks may rely on poor health behaviors (PHB) to cope with stress arising from their social location in the stratification system, which protects their mental health but has negative long-term physical health consequences. We test the EA model using Wave IV data from the National Longitudinal Study of Adolescent Health, restricting our sample to Whites, Blacks, and Latinos. Our study extends that of prior work by using three stress indicators – perceived stress, discrimination, and economic hardship – as well as a comprehensive set of recent PHB. Contrary to expectations of the EA model, preliminary results suggest that PHB amplifies the effects of several dimensions of stress on depressive symptoms among Black and Latino young adults.

Key words: mental health, race, and social stratification

INTRODUCTION

The relationship between health and race is varying and complex. While the overall physical health of the U.S. population has improved in recent decades, Black Americans report greater physical health morbidity, including higher rates of diabetes and hypertension, and mortality (Centers for Disease Control 2011). Conversely, findings from epidemiological surveys indicate that Blacks report similar or lower levels of major mental disorders, such as major depression, compared with whites (Breslau et al. 2006; Williams et al. 2007). While social factors like socioeconomic status and discrimination are salient in explaining disparities in physical health (Watkins, Walker and Griffith 2010; Williams and Earl 2007), limited attention has been given to examining and explaining the physical-mental health "paradox" among Black Americans.

In an effort to explain this paradox, Mezuk and colleagues (2013) put forth a testable, conceptual model focusing on the interplay between stress, health behaviors, and physical and mental health. The model, entitled environmental affordance (EA), adds to the existing theoretical and empirical work on stress-coping by emphasizing environmental opportunities and constraints. Specifically, social and contextual factors influence the available resources individuals have to manage chronic and acute stressors. Therefore, individuals with limited resources may rely on harmful strategies that in the short term help them deal with the hassles of life, thereby promoting mental health, but are detrimental to physical health over the life course (Mezuk et al. 2013). In the present case, Blacks are thought to experience unique stressors – largely but not solely based on race – including internalized racism, threats of discrimination, and socio-economic disadvantage that jeopardize their physical and mental health. Due to the social disadvantage they face, however, Black Americans may rely on self-regulatory, poor health (PHB) strategies, including tobacco and alcohol use, illicit substance use, and unhealthy dietary practices, when faced with stressful events. These coping practices may protect the mental health of Blacks in the short-term, but create large disparities in their morbidity and mortality over the life course.

Several studies have examined the EA model with various results. Jackson et al. (2010) found that among Blacks the relationship between stress and major depression was strongest among those who had not engaged in poor health behaviors (PHB) compared to those who had. More specifically, although stressful life events increase the risk of depression among black and white adults; for Blacks the association between stress and depression is weakest among those who engaged in PHB. Other studies have found either (a) no significant association between PHB and stress on major depression among Black Americans (Boardman and Alexander 2011; Kershaw et al. 2010), or (b) that engaging in PHB amplified the effects of stress on depression among Blacks (Mezuk et al. 2010; Keyes, Barnes and Bates 2011). These inconsistent findings suggest that additional work examining and refining the EA model are needed.

Several issues guide our analysis. First, given that poor health behaviors are conceptualized in the EA model to be protective of mental health in Black Americans, it is important to identify the

best empirical measures of these constructs as possible. In previous studies examining the effects of poor health behaviors, more temporally distal measures have been used to capture this important construct, including whether the respondent has ever smoked cigarettes or consumed alcohol, or proxy measures have been used, such as using obesity to capture overeating (Jackson et al. 2010; Keyes et al. 2011; Mezuk et al. 2010; Boardman and Alexander 2011). Thus, these previous measures may not have truly captured the use of PHB as coping strategies in response to stressful experiences. The present study builds and adds to the existing work on the relationship between stress, PHB and mental health by using a comprehensive measure of PHB that advances our understanding of this complex phenomenon.

Second, previous studies have examined the interplay between stress, PHB and mental health among African Americans and non-Hispanic whites only. Little is known about how these processes play out by gender and among other ethnic-minorities (for exception see Kershaw et al. 2010). Despite lower SES and social marginalization, including elevated experiences of discrimination and stress, Latinos, particularly first generation Latinos, report better mental health than non-Hispanic whites (Vega and Alegria 2002). There remains a gap in the literature regarding which factors protect the mental health of Latinos. To our knowledge, we are the first to examine the relationship between stress, poor health behaviors, and mental health in a representative sample of non-Hispanic white, Black and Latino young adults. Additionally, there is strong evidence to suggest that these processes may vary based on gender. Specifically, males may be more likely to engage in poor health behaviors, including smoking, drug and alcohol use, than females (Hair et al 2009). By examining the intersection of race and gender we gain a better understanding of the important, and unique, role of social and material factors in health disparities.

Lastly, although suggested in the EA model, no previous work has examined the effects of both positive and negative coping strategies simultaneously. However, a common explanation for the better mental health of Black Americans is the use of positive coping, including greater use of religious and spiritual resources and other forms of social support, as an important strategy for mitigating the harmful effects of stress. How these different forms of coping (i.e., PHB and positive coping) interact is largely unknown. We examine the effects of both poor health strategies, as well as various measures of positive coping, including religious coping (i.e., religious guidance and prayer) and social support (i.e., parental and material support).

DATA AND METHODS

Data for this study comes from Wave 4 of the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a longitudinal study of a nationally representative sample of adolescents first interviewed in grades 7-12 during the 1994-95 school year. The Add Health sample has been followed with four in-home interviews, the most recent in 2008, when the sample was aged 24-32. The data contains extensive information on the social, economic, psychological and physical well-being of young adults. The sampling methods of Add Health have been described in detail elsewhere (Harris 2013). We restrict our analysis to non-Hispanic

White, non-Hispanic Black and Latino respondents. After list wise deletion of missing cases there is an analytical sample of 14,265 respondents.

Dependent Variable.
Depressive Symptoms. The five-item version of the Center for Epidemiologic Studies depression scale (CES-D) was used in the present study. The respondents were asked how often during the past seven days s/he felt: (a) bothered by things that usually don't bother you; (b) you felt that you were too tired to do things; (c) you could not shake off the blues even with help from family or friends; (d) you had trouble keeping your mind on what you were doing; and (e) you felt sad. Responses ranged from 0=never or rarely to 3=most or all of the time. Items were reverse coded where necessary so that higher scores reflect more depressive symptoms (Crohbach alpha=.79).

Independent Variables.
Stress. Three distinct measures of stress were used in the present study. First, *perceived stress*, adopted from the Cohen Perceived Stress scale, measures the degree to which situations in one's life are appraised as stressful (Cohen, Kamarck, and Melmestein 1983). Respondents were asked how often in the past 30 days they felt: (a) unable to control the important things in life; (b) confident in their ability to handle personal problems; (c) things were going their way; and (d) difficulties were piling up so high that they could not overcome them. Available responses were 0=never to 4=very often, and were recoded where necessary so that higher scores reflect greater perceived stress. (Crohbach alpha=.72). Second, *economic hardship* was the sum of five items (i.e., 1=yes vs. 0=no), including how often in the past 12 months, respondents: (a) were without a phone service due to lack of money; (b) did not pay their rent/mortgage in full; (c) did not pay the utilities bills in full; (d) had utilities turned off; and (e) worried about food running out. Lastly, *perceived discrimination* was measured via the question, "In your day-to-day life, how often do you feel you have been treated with less respect or courtesy than other people?" Responses ranged from 0=never to 3=often.

Coping Strategies. Several dimensions of coping are included in the analysis. First, building and adding to the approach of Jackson et al (2010), we identified six poor health behaviors (PHB), including: (a) binge drinking measured by the consumption of 4 or more drinks in a row in the same sitting in the past 30 days; (b) smoking as having at least one cigarette in the past 30 days; (c) illicit drug use characterized as using either marijuana and/or injecting illegal drugs in the past 30 days; (d) physical inactivity as defined as "no bouts" of physical activity in the past seven days; and (e) unhealthy dietary practices measured by eating fast-food more than once a day for the past seven days and/or drinking 2 or more diet or sweetened beverages in the past seven days. PHB is the sum of these 6 behaviors (ranging from 0-6).

The influence of positive coping on mental health is also assessed in the present study, including religious support and paternal support. Two items assessed religious support. First, a measure of religious guidance, which asked how often respondents used religious and/or spiritual beliefs during times of personal troubles. Responses ranged from 0=never and 4=very often. Second, respondents were asked how often they engaged in private prayer (ranging from 0=never to 7=more than once a day).

Controls. The analyses controlled for several background factors that are known or suspected correlates of the dependent and independent variables, and therefore could confound the associations of interest in this study. The factors include: gender (1=male vs. 0=female); age (in years); relationship status (a series of dummy variables 1=cohabitation, 1=never married, 1=divorced and/or separated, with married serving as the reference category); the five personality measures (including openness, conscientiousness, extraversion, agreeableness and neuroticism); and current SES (composite measure of education, income, and poverty ratio).

Analytical Strategy

The data analysis progressed in several steps. First, descriptive statistics among the study variables are displayed in Table 1. Second, we examine the net effects of stress, poor health behaviors, and positive coping (i.e., religion) on depressive symptoms, stratified by race, using ordinary least squares (OLS) regression. These results are presented in Model 1 in Tables 2-4. Next, in examining the moderating effects of poor health behaviors, interaction terms were added to the full main effects OLS regression model (i.e., Stress x PHB). Prior to calculating the cross-product terms, variables were mean-centered as recommended by Aiken and West (1991), to reduce collinearity between raw and product terms and for easier interpretation of the main effects. Each interaction term was entered into the model independently. These results are presented in Models 2-4 in Tables 2-4.

PRELIMINARY RESULTS

African Americans and Latinos report more depressive symptoms than their non-Hispanic white counterparts (Table 1). Additionally, African Americans report higher levels of perceived stress, economic hardship, and perceived discrimination compared with white respondents. There are no significant differences between Latinos and non-Hispanic whites on our three dimensions of stress. Regarding, poor health behaviors, it appears that non-Hispanic whites report engaging in a greater number poor health behaviors than African Americans or Latinos. In examining race-ethnic differences in positive coping, African Americans and Latinos engage in higher levels of religious guidance and private pray than non-Hispanic whites.

Preliminary results for non-Hispanic whites suggest that all three measures of stress (i.e., perceived stress, economic hardship, and discrimination) are positively associated with depressive symptoms. Additionally, poor health behaviors are significantly associated with depressive symptoms ($b=.11$, $p<.01$). Turning to the results for the moderating role of poor health behaviors, we find no significant interactive effects among non-Hispanic whites.

For Black Americans, we find perceived stress and discrimination are positively associated with depressive symptoms net of covariates. Economic hardship, however, has no significant effect on the depressive symptoms of Black young adults. Poor health behaviors are also found to have a positive association with Blacks' depressive symptoms ($b=.09$, $p<10$). However, the association is only marginally significant. Two of the three interactive relationships surface in these data for Blacks. More specifically, poor health behaviors appear to exacerbate (or amplify) the association between perceived stress ($b=.05$, $p<.05$), perceived discrimination ($b=.12$, $p<.05$), and depressive symptoms.

The results for Latinos suggest that the three dimensions of stress are positively associated with depressive symptoms. Surprisingly, poor health behaviors appear to have no significant association with Latino depressive symptoms. Regarding the moderating effects of poor health behaviors, we find little support for the role of these behaviors in protecting the mental health of Latinos. These results suggest that engaging in poor health behaviors amplifies the deleterious relationship between perceived discrimination and depressive symptoms ($b=.18$, $p<.05$).

Plans for Continued Research

Future plans for this project include additional analyses that will examine: (a) the intersection of race and gender by including three-way interactions between stress, poor health behaviors, and gender, and (b) the inclusion of additional indicators of social support, such as parental emotional and material support. Additionally, we will examine the moderating role of positive coping (i.e., religious support and social support) on the relationship between stress and depression.

References Available Upon Request

Table 1: Sample Characteristics by Race, Weighted Data, Add Health Wave IV

Sample Characteristics	Range	**Non-Hispanic Whites** Mean (SE) or %	**African Americans** Mean (SE) or %	**Latinos** Mean (SE) or %	**Total Population** Mean (SE) or %
Depression	0-15	2.43 (0.04)	3.14 (0.12)*	2.71 (0.10)*	2.58 (0.04)
Perceived stress	0-16	4.66 (0.05)	5.29 (0.12)*	4.84 (0.11)	4.80 (0.05)
Economic hardship	0-6	0.45 (0.02)	0.83 (0.05)*	0.52 (0.04)	0.51 (0.02)
Perceived discrimination	0-3	0.97 (0.01)	1.07 (0.02)*	1.00 (0.04)	0.98 (0.01)
Unhealthy behaviors	0-6	1.86 (0.02)	1.75 (0.04)*	1.73 (0.04)*	1.82 (0.02)
Age (years)	24-34	28.37 (0.13)	28.65 (0.21)	28.48 (0.22)	28.44 (0.12)
Sex					
Male	0-1	50%	47%	51%	50%
Female	0-1	50%	53%	49%	50%
Current SES		-0.00 (0.03)	-0.33 (0.06)	-0.20 (0.04)	-0.07 (0.03)
Marital Status					
Married	0-1	48%	27%	45%	44%
Cohabitating	0-1	19%	24%	17%	20%
Divorced	0-1	4%	4%	4%	4%
Never Married	0-1	28%	46%	34%	32%
Religion					
Religious guidance	0-4	1.86 (0.03)	2.87 (0.05)	2.17 (0.04)	2.06 (0.03)
Frequency of prayer	0-7	3.50 (0.06)	5.40 (0.07)	4.10 (0.09)	3.87 (0.06)
Personality Measures					
Openness	4-20	14.55 (0.06)	14.25 (0.10)	14.22 (0.09)	14.47 (0.05)
Conscientiousness	4-20	14.47 (0.05)	14.85 (0.06)	14.66 (0.10)	14.57 (0.04)
Extraversion	4-20	13.35 (0.05)	12.64 (0.09)	13.36 (0.13)	13.23 (0.05)
Agreeableness	4-20	15.31 (0.05)	15.03 (0.08)	14.94 (0.09)	15.21 (0.05)
Neuroticism	4-20	10.28 (0.05)	10.69 (0.07)	10.66 (0.11)	10.37 (0.04)
Nativity+					
U.S. born	0-1	---	X	80%	x
Foreign born	0-1	x	X	21%	x
N		7925	3003	2285	14,366

*p<.05 vs. significant mean differences vs. non-Hispanic whites

+ The nativity item (1=foreign born vs. 0=all others) was included in the Latino analysis only.

Table 2: The Estimated Net Effects of Stress, Poor Health Behaviors, and Other Covariates on Depressive Symptoms for Non-Hispanic whites

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Perceived stress	0.36 (0.02)***	0.36 (0.02)***	0.36 (0.02)***	0.36 (0.02)***
Economic hardship	0.13 (0.04)*	0.11 (0.04)**	0.12 (0.04)*	0.12 (0.04)*
Perceived discrimination	0.18 (0.05)***	0.17 (0.05)***	0.18 (0.05)***	0.18 (0.05)***
Unhealthy behaviors	0.11 (0.03)**	0.09 (0.03)**	0.11 (0.03)***	0.11 (0.03)*
Age	0.01 (0.02)	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
Sex (Male=1)	0.04 (0.06)	0.04 (0.06)	0.05 (0.06)	0.05 (0.06)
Current SES	0.03 (0.04)	0.03 (0.04)	0.04 (0.04)	0.03 (0.04)
Marital Status				
Cohabitating	-0.02 (0.06)	-0.01 (0.06)	-0.02 (0.07)	-0.02 (0.06)
Divorced	0.29 (0.15)	0.23 (0.16)	0.22 (0.16)	0.22 (0.16)
Never Married	0.20 (0.07)*	0.23 (0.07)**	0.20 (0.07)*	0.20 (0.07)**
Religion				
Religious guidance	0.03 (0.04)	0.03 (0.04)	0.03 (0.04)	0.03 (0.04)
Frequency of prayer	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
Personality Measures				
Openness	0.01 (0.13)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Conscientiousness	-0.05 (0.11)***	-0.05 (0.01)***	-0.05 (0.01)***	-0.05 (0.01)***
Extraversion	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Agreeableness	0.05 (0.02)*	0.05 (0.02)*	0.05 (0.02)*	0.05 (0.02)**
Neuroticism	0.24 (0.02)***	0.23 (0.01)***	0.23 (0.02)***	0.23 (0.01)***
Interactions[a]				
Perceived stress x Unhealthy behaviors		0.06 (0.01)		
Economic hardship x Unhealthy behaviors			0.01 (0.03)	
Perceived discrimination x Unhealthy behaviors				0.09 (0.05)
Intercept	-3.01	-2.99	-3.01	-2.99
Adj. R2	0.45	0.46	0.45	0.45

+p<.10; *p<.05;**p<.01;***p,>001; OLS Regression: beta coefficients are presented and standard errors are in the parenthesis.

[a] Components of the interaction term are zero-centered as recommended by Aiken and West (1991) and are entered independently.

Table 3: The Estimated Net Effects of Stress, Poor Health Behaviors, and Other Covariates on Depressive Symptoms for African Americans

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Perceived stress	0.37 (0.03)***	0.37 (0.03)***	0.37 (0.03)***	0.37 (0.03)***
Economic hardship	-0.01 (0.04)	-0.00 (0.05)	-0.00 (0.05)	0.01 (0.05)
Perceived discrimination	0.47 (0.09)***	0.45 (0.09)***	0.47 (0.09)***	0.47 (0.09)***
Unhealthy behaviors	0.09 (0.06)+	0.09 (0.05)+	0.94 (0.06)+	0.10 (0.06)+
Age	-0.01 (0.04)	-0.00 (0.04)	-0.01 (0.04)	-0.00 (0.04)
Sex (Male=1)	-0.15 (0.10)	-0.14 (0.10)	-0.14 (0.10)	-0.14 (0.10)
Current SES	-0.18 (0.10)	-0.18 (0.10)	-0.18 (0.10)	-0.18 (0.10)
Marital Status				
Cohabitating	-0.01 (0.11)	-0.02 (0.12)	-0.01 (0.11)	-0.01 (0.11)
Divorced	0.29 (0.30)	0.31 (0.30)	0.29 (0.30)	0.30 (0.30)
Never Married	0.07 (0.13)	0.07 (0.13)	0.07 (0.13)	0.07 (0.13)
Religion				
Religious guidance	0.09 (0.06)	0.08 (0.07)	0.08 (0.06)	0.09 (0.06)
Frequency of prayer	0.08 (0.03)*	0.08 (0.03)*	0.07 (0.03)*	0.08 (0.03)*
Personality Measures				
Openness	0.01 (0.03)	0.01 (0.03)	0.01(0.03)	0.01 (0.03)
Conscientiousness	0.00 (0.04)	0.00 (0.04)	0.00 (0.04)	0.00 (0.04)
Extraversion	-0.04 (0.02)+	-0.04 (0.02)+	-0.04 (0.02)+	-0.04 (0.02)*
Agreeableness	-0.03 (0.04)	-0.03 (0.04)	-0.03 (0.04)	-0.03 (0.04)
Neuroticism	0.28 (0.03)***	0.28 (0.03)***	0.28 (0.03)***	0.28 (0.03)***
Interactions[a]				
Perceived stress x Unhealthy behaviors		0.05 (0.02)*		
Economic hardship x Unhealthy behaviors			0.04 (0.04)	
Perceived discrimination x Unhealthy behaviors				0.12 (0.06)*
Intercept	-2.17	-2.21	-2.18	-2.21
Adj. R2	0.42	0.42	0.42	0.42

+p<.10; *p<.05;**p<.01;***p,>001 OLS Regression: beta coefficients are presented and standard errors are in the parenthesis

[a] Components of the interaction term are zero-centered as recommended by Aiken and West (1991) and are entered independently.

Table 4: The Estimated Net Effects of Stress, Poor Health Behaviors, and Other Covariates on Depressive Symptoms for Hispanics

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Perceived stress	0.38 (0.04)***	0.38 (0.04)***	0.38 (0.04)***	0.38 (0.04)***
Economic hardship	0.21 (0.06)**	0.20 (0.06)**	0.20 (0.07)**	0.20 (0.06)***
Perceived discrimination	0.22 (0.08)**	0.23 (0.09)**	0.22 (0.09)**	0.22 (0.08)**
Unhealthy behaviors	0.17 (0.08)	0.06 (0.07)	0.07 (0.08)	0.05 (0.08)
Age	0.00 (0.03)	-0.00 (0.03)	0.00 (0.03)	0.00 (0.03)
Sex (Male=1)	0.27 (0.16)*	0.26 (0.15)+	0.26 (0.15)	0.26 (0.15)+
Current SES	-0.06 (0.09)	-0.06 (0.09)	-0.06 (0.09)	-0.06 (0.09)
Marital Status				
Cohabitating	0.22 (0.20)	0.21 (0.19)	0.22 (0.20)	0.21 (0.19)
Divorced	0.24 (0.36)	0.24 (0.37)	0.24 (0.36)	0.24 (0.36)
Never Married	0.10 (0.15)	0.12 (0.14)	0.10 (0.15)	0.11 (0.15)
Religion				
Religious guidance	0.00 (0.05)	-0.00 (0.05)	0.00 (0.05)	-0.00 (0.05)
Frequency of prayer	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)
Personality Measures				
Openness	-0.02 (0.04)	-0.03 (0.04)	-0.03 (0.04)	-0.02 (0.04)
Conscientiousness	-0.10 (0.02)***	-0.10 (0.02)***	-0.10 (0.02)***	-0.10 (0.02)***
Extraversion	0.01(0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Agreeableness	0.07 (0.03)*	0.07 (0.03)*	0.07 (0.03)*	0.07 (0.03)*
Neuroticism	0.17 (0.03)***	0.18 (0.03)***	0.17 (0.03)***	0.17 (0.03)***
Foreign born	-0.10 (0.14)	-0.10 (0.15)	-0.10 (0.14)	-0.08 (0.14)
Interactions[a]				
Perceived stress x Unhealthy behaviors		0.05 (0.03)		
Economic hardship x Unhealthy behaviors			0.02 (0.07)	
Perceived discrimination x Unhealthy behaviors				0.18 (0.08)*
Intercept	-1.28	-1.17	-1.29	-1.34
Adj. R2	0.40	0.40	0.40	0.40

+p<.10; *p<.05;**p<.01;***p,>001 OLS Regression: beta coefficients are presented and standard errors are in the parenthesis

[a] Components of the interaction term are zero-centered as recommended by Aiken and West (1991) and are entered independently.