

Forgiveness of Others and Health: Do Race and Neighborhood Matter?

Michael J. McFarland,¹ Cheryl A. Smith,² Loren Toussaint,³ and Patricia A. Thomas¹

¹Population Research Center, The University of Texas at Austin.

²Department of Sociology, The University of Connecticut.

³Department of Psychology, Luther College, Decorah, Iowa.

Objectives. This study examines the relationship between interpersonal forgiveness and health for older Blacks and Whites. We outline a series of arguments concerning the following: (a) how forgiveness can affect health, (b) how forgiveness may be more protective for Blacks, and (c) how the relationship between forgiveness and health may vary by neighborhood deterioration.

Method. Two waves (2001 and 2004) of the Religion, Aging, and Health Survey provided data from a nationally representative elderly sample of 436 Blacks and 500 Whites. Measures included sociodemographics, forgiveness, and three dimensions of health: self-reported health, alcohol use, and chronic conditions. We employ both longitudinal and cross-sectional analyses.

Results. Results suggest that forgiveness of others was protective of health for Blacks but not Whites. Moreover, among Blacks, we found the following: (a) forgiveness was positively associated with self-reported health over time, (b) forgiveness was negatively associated with alcohol use and number of chronic conditions, and (c) forgiveness interacted with neighborhood deterioration such that the beneficial effects of forgiveness for self-reported health did not extend to those living in run-down neighborhoods.

Discussion. Race and neighborhood were shown to be important for understanding the forgiveness–health connection. Forgiveness was associated with better health for Blacks but not Whites, consistent with McCullough’s evolutionary framework (McCullough, M. E. (2008). *Beyond revenge: The evolution of the forgiveness instinct*. San Francisco, CA: Jossey-Bass), forgiveness was beneficial in some settings but had a deleterious impact in more noxious environments. This study suggests that researchers should give more consideration to race and social context in attempting to more fully understand the relationship between forgiveness and health.

Key Words: Forgiveness of others—Health—Neighborhood—Race.

THE last decade has witnessed an explosion of research focusing on the beneficial effects of psychosocial factors for health and well-being (e.g., Taylor & Seeman, 2006). Interpersonal forgiveness is one such factor that has received increasing attention but less so than other psychosocial factors. Forgiveness of others, measured in a variety of ways, has been shown to have beneficial effects on mental and physical well-being (Bono & McCullough, 2004; Thoresen, Harris, & Luskin, 2000). This vein of research, however, largely ignores the social context, implicitly assuming that the relationship between forgiveness and well-being is constant for all people regardless of the broader social milieu. We focus on two important aspects of the social context in our examination of forgiveness and health: race and neighborhood. We suggest that forgiveness may become especially important to Blacks and that the beneficial effect of forgiveness for health will vary depending on the neighborhood environment in which one lives.

Evidence suggests that forgiveness may be particularly germane to the lives of older adults (Bono & McCullough, 2004). Several studies, including one based on a large,

nationally representative survey (Toussaint, Williams, Musick, & Everson, 2001), have shown that the magnitude of the forgiveness–health connection increases with age, with the strongest associations evident among elders. Furthermore, several studies show that older adults are more prone to forgive others for their transgressions than their younger counterparts and that the increased propensity to forgive may be a common part of aging (Girard & Mullet, 1997; Toussaint et al., 2001).

These studies documented changes across the life span that reflect enhanced dispositional forgiveness. Dispositional forgiveness can be thought of as an enduring trait that offers a propensity toward forgiving others across situations and time (Berry, Worthington, O’Connor, Parrot, & Wade, 2005). Although traits are often thought of as fixed and heavily influenced by genetics and biology, they have been shown to possess a significant degree of malleability over time (Srivastava, John, Gosling, & Potter, 2003). This offers the possibility that forgiveness is not a static personality characteristic but a dynamic tendency that may follow different developmental trajectories. The importance of state- or offender-specific forgiveness,

however, should not be overlooked. Developing higher levels of the disposition toward forgiveness necessitates an improved ability to forgive specific offenders for specific offenses. In other words, before one can become an all-around more forgiving person, one must begin by learning to forgive specific individuals for specific acts. Continuing research in this area shows that dispositional forgiveness can be cultivated (Harris et al., 2006; Worthington, Witvliet, Pietrini, & Miller, 2007). A recent meta-analysis of 37 forgiveness intervention studies provides especially compelling evidence for this approach (Wade & Worthington, 2005).

Much of what we know regarding the beneficial role of forgiveness for health comes from experiments in controlled laboratories or convenience samples such as young college students (e.g., Wilson, Milosevic, Carrol, Hart, & Hibbard, 2008). In order to fully understand how forgiveness affects health, researchers must acknowledge that the broader social context in which forgiveness occurs may alter the nature of the forgiveness–health connection. The purpose of our study is twofold: (a) to determine if the relationship between forgiveness and health varies by race and (b) to determine if the relationship between forgiveness and health varies by neighborhood environment.

Forgiveness, Race, and Health

Forgiveness has been shown to be related to both mental and physical health. For example, high levels of interpersonal forgiveness are associated with less negative affect, such as depression and anxiety (Coyle & Enright, 1997), fewer negative health habits, such as drinking and smoking, and lower hematocrit and white blood cell counts (Seybold, Hill, Newmann, & Chi, 2001). Thoresen and colleagues (2000) propose several pathways by which forgiveness may influence health outcomes: (a) a decrease in chronic blaming, hostility, and anger, (b) decreases in sympathetic nervous system (SNS) hyperarousal and allostatic load, (c) increases in optimism and positive self-evaluative thoughts, (d) increases in self-efficacy, (e) increases in social and emotional support, and (f) increases in transcendent consciousness (greater religious or spiritual well-being).

Three key mechanisms of Thoresen and colleagues (2000) are of especial importance for older Blacks. First, older African Americans often form extensive social support systems to help cope with day-to-day life (Krause, 2002). These support systems provide emotional, tangible, anticipated, and spiritual support with each having a potential impact upon physical health. Forgiveness is essential for the effective maintenance of these social support systems, and therefore, those with the propensity to forgive will likely have more social support to rely upon. The tendency to encounter the interpersonal conflict can reduce the quantity and quality of support networks. Forgive-

ness of others may reduce negative reactions to interpersonal conflicts such as anger, resentment, and blame and facilitate the development and maintenance of important social relationships.

Second, Blacks have undergone a physical weathering process caused by social and economic adversity (Geronimus, Hicken, Keene, & Bound, 2006). Older Blacks likely witnessed severe adversity and racism, making them an especially vulnerable population. This weathering process is due at least in part to chronic arousal of the SNS, which activates the body's stress response through the hypothalamic–pituitary–adrenal (HPA) axis. Geronimus and colleagues (2006) theorize that Blacks experience more frequent and harmful stressors than other groups, and this leads to biological dysregulation. This biological dysregulation, in turn, accounts for a large proportion of the racial disparities in health and mortality found in the United States. Another consequence of this process is that over time, the SNS becomes highly sensitive. Repeated activation of the HPA axis damages the vagus nerve in the brain stem, which is responsible for acting as a brake in the physiological stress process. When this is damaged, periods of stress are extended beyond what they would have been before it was damaged. Damage to this part of the brain is associated with not being able to relax and can increase the likelihood of self-medication (McEwen & Lasley, 2002). Moreover, the stressful environments that Blacks live in may interact with negative health behaviors and become especially detrimental to health. Many health behaviors, including alcohol use, have a more adverse effect on health for Blacks than Whites at equivalent levels of usage. For instance, Blacks were found to have more liver damage than Whites at equivalent levels of alcohol use even among light drinkers (Stranges et al., 2004).

Forgiveness has been conceptualized as an emotion-focused coping mechanism for dealing with interpersonal and social stress (Worthington & Scherer, 2004). Discrimination, racism, and economic disadvantage are, for many Blacks, immutable negative forces of social life. Hence, emotion-focused approaches like forgiveness may offer an effective means of adjustment, given that problem-focused approaches may yield little gain (Ysseldyk, Matheson & Anisman, 2009; Zakowski, Hall, Cousino Klein, & Baum, 2001). Forgiveness of others also decreases chronic blaming, which may decrease the sensitivity of the SNS and prevent repeated activation of the HPA axis and therefore decreases biological dysregulation (Thoresen et al., 2000). Forgiveness has also been argued to be connected to fewer harmful health behaviors (Toussaint & Webb, 2005). For these reasons, forgiveness may be protective of health because as an emotion-focused coping mechanism, it is associated with decreased biological dysregulation and decreased likelihood of engaging in harmful health behaviors.

Third, forgiveness is thought to bring about higher levels of positive emotions (e.g., optimism) and lower levels of negative emotions (e.g., anger; Lawler et al., 2005). Blacks

are differentially exposed to traumatic stressors that have deleterious long-lasting effects on mental health (Turner & Avison, 2003). Older Blacks may be at especially high risk of experiencing depressive symptoms (Skarupski et al., 2005). Moreover, depressive symptoms and poor mental health in general can produce many health afflictions (Carney, Freedland, Miller, & Jaffe, 2002). Given these concerns with older Blacks' mental health, the tendency to forgive may act to benefit mental health through increases in positive emotions and decreases in negative emotions. General mental health benefits, in turn, may result in improvements in health.

To our knowledge, only one study has addressed whether Blacks benefit more from forgiveness than Whites in regard to health. Toussaint and Williams (2003) employed an interview-based study that assessed resting blood pressure and cortisol levels in a diverse sample of 100 midwestern community residents. Results showed that forgiveness of others was associated with lower levels of diastolic blood pressure and basal cortisol but only among low socioeconomic status (SES) Blacks and not high SES Blacks or high or low SES Whites. Although far from conclusive, this study provides some empirical support to the argument that forgiveness of others may be especially protective for Blacks. Based on these arguments and empirical findings, we present our first hypothesis:

H1: Forgiveness of others will be more strongly associated with better self-reported health, less alcohol use, and fewer chronic conditions for Blacks than Whites.

Forgiveness, Neighborhood, and Health

The propensity to be forgiving of others may not be beneficial in all environments. McCullough (2008), using an evolutionary framework, claims that human beings genetically possess the ability for both forgiveness and revenge. He suggests that the ability to forgive or stay angry is hard-wired into humans, but the broader social context determines when forgiveness (or revenge) is appropriate and hence adaptive or beneficial for survival. For example, individuals living in Philadelphia's less affluent neighborhoods view any signs of forgiveness or conciliatory acts as a sign of weakness that encourages others to prey on them (Anderson, 1999). In fact, revenge is encouraged culturally for even the slightest personal transgressions. These disadvantaged communities socialize their members regarding forgiveness and revenge and see the general tendency to forgive as a sign of weakness that opens one up to predatory attacks. This evidence of forgiveness interpreted as weakness in these disadvantaged Philadelphia neighborhoods raises important questions about the impact of forgiveness in deteriorated neighborhoods in general. Forgiveness may not be seen as the best approach in some contexts, and a sense of resistance may instead be beneficial for these groups. According to McCullough (2008), the social milieu, at least in part, determines one's response to interpersonal conflict;

hence, the biological ability for forgiveness or revenge interacts with the broader social context to influence one's disposition to forgive during times of interpersonal conflict.

Forgiveness of others in most social environments will reduce interpersonal conflict and anger and allow for an individual to create and maintain social support networks that are essential for health and well-being. In more noxious environments, however, there is reason to expect that forgiveness will be harmful for health. In the most dilapidated neighborhoods, a predisposition to forgive others may be viewed as a weakness that decreases social status and opens one up to attack (Anderson, 1999). Residents in more deteriorated neighborhoods may be hypervigilant for acts of interpersonal transgressions. McCullough's (2008) argument that forgiveness is a function of a social and biological interaction suggests that forgiveness of others provides an evolutionary advantage in some social contexts but is harmful in others. If the social milieu sends signals to its residents that those who forgive others are weak and the residents internalize these messages, then the most forgiving of people will witness diminished social status and increases in interpersonal conflict because of others' perceptions that they make easy targets. Lower levels of status and higher levels of interpersonal conflict may lead to decreases in health. Indeed, social status is associated with functioning of adrenocortical, cardiovascular, and immune systems (Sapolsky, 2004). Similarly, interpersonal conflict can lead to deteriorating health including weakening of the immune system (Cohen, Tyrell, & Smith, 1993).

In addition to Blacks being disadvantaged in social, economic, and physical well-being, they are also disadvantaged in terms of environment. Due to segregation and socioeconomic disadvantage, Blacks are more likely to live in disadvantaged and run-down neighborhoods than Whites. Blacks continue to face high levels of residential segregation (Wilkes & Iceland, 2004) characterized by socioeconomic disadvantage. Here we focus on neighborhood deterioration as an indicator of neighborhood environment. Neighborhood deterioration connotes the physical condition of the neighborhood including buildings, noise pollution, air pollution, streets, yards, and sidewalks (Krause, 2006). Deteriorated neighborhoods are characterized by high levels of interpersonal conflict and low levels of social support (Krause, 2006) and may affect health because of these factors as well as decreased self-efficacy and a lack of organizational resources (e.g., churches, hospitals, and grocery stores). Whereas deteriorated neighborhoods are likely characterized by economic disadvantage for Whites and Blacks, social disadvantage may be especially prominent in Black neighborhoods. For example, Black neighborhoods may be characterized, more than White ones, by a culture that emphasizes that economic mobility is highly improbable, possibly due to racism, discrimination, and distrust of others and institutions. The conjoint effect of economic and social disadvantage may amplify cultural norms that equate

conflict with social status and forgiveness with weakness. For these reasons, Blacks who live in deteriorated neighborhoods characterized by subcultures that devalue forgiveness may not receive the health benefits that their peers in less deteriorated neighborhoods receive. Based on these arguments, we present our second hypothesis:

H2: The effect of forgiveness of others on three health indices: (a) better self-reported health, (b) less alcohol use, and (c) fewer chronic conditions will be moderated by neighborhood deterioration. We expect that the positive effect of forgiveness on health will be greater among those living in the least deteriorated neighborhoods.

METHOD

Sample

The data from this study come from the Religion, Aging, and Health Survey, a nationally representative longitudinal survey of White and Black noninstitutionalized, English speaking household residents who were at least 66 years of age living in the contiguous United States. The study population was limited to currently practicing Christians, individuals who were Christians in the past but no longer practice any religion, and individuals who were never associated with any faith. Due to a lack of feasibility in constructing religiosity measures that are culturally appropriate for all religious traditions, those who identified with a non-Christian tradition were excluded from the study.

Harris Interactive conducted 1,500 in-home interviews in 2001 with an overall response rate of 62%. Older Blacks were oversampled and represented roughly half the sample (752 Blacks). Of the original respondents, 1,024 were reinterviewed in 2004. Among those who were not reinterviewed, 75 refused to participate, 112 could not be located, 70 were too ill to participate, 11 were currently in nursing homes, and 208 were deceased. The interview rate for the second wave was 80% when those who died or were living in nursing homes were excluded.

In order to investigate the same respondents in all three analyses and still have sufficient statistical power, we performed multiple imputation for all independent variables. We imputed missing data for these variables for 20 data sets using the *mi impute* command in Stata. Estimates from multiple imputation have been shown to be more accurate than single imputation techniques (Acock, 2005). The data sets were then combined in order to produce regression estimates. After multiple imputation, we had a total of 936 cases with 436 Blacks and 500 Whites. From the original 1,024 who were reinterviewed, 88 did not provide valid responses for self-reported health at either wave, alcohol use at Wave 1, or number of chronic conditions at Wave 2. As a precaution, we ran each model for each dependent variable with the maximum number of cases available (i.e., the number of cases varied by dependent variable). These additional models resulted in the same pattern of findings presented in

this study. The average age of individuals in our sample was 73.57 (standard deviation [*SD*] = 5.92 years), and approximately 46% were married. The average number of completed years of schooling was approximately 11.50 (*SD* = 3.38).

Measures

Table 1 presents the survey items that compose the primary variables used in this study.

Dependent variables.—Self-reported health was assessed with a 3-item scale and had an interitem reliability score of $\alpha = .61$ at Wave 1 and $\alpha = .73$ at Wave 2. The metrics of the response categories were different, so we transformed the first item in the scale (see item “1A” of Table 1) to have a range of 1–3. The items were averaged where higher scores denote better health. Alcohol use was measured via a dummy variable, which was derived from an item asking, “Do you ever drink beer, wine or liquor?” In this sample of older adults where the average age is approximately 74, heavy alcohol use tends to be rare. Although modest alcohol use can have a beneficial effect on some health outcomes (Coate, 1993), moderate drinking has been linked to increased risk for adverse drug reactions and ischemic stroke under certain conditions among older adults (Mukamal et al., 2005; Onder et al., 2002). Thus, even lower levels of alcohol consumption may have health consequences for older adults. Also, because alcohol use was relatively constant across time, we only utilize data from the first wave. Due to the consistency of alcohol use across both waves, alcohol measured at Wave 1 eliminated all other longitudinal effects. Finally, we summed the number of chronic conditions that the respondent experienced in the last 12 months. There were 12 possible conditions ranging from arthritis to cancer with an average value of 2.5. Information on chronic conditions was only available from the second wave.

Independent variables.—Forgiveness of others was measured by a 4-item scale and revealed sufficient reliability ($\alpha = .68$ at Wave 1 and $\alpha = .73$ at Wave 2). Neighborhood deterioration was evaluated with five items used in previous literature (Krause, 1993, 2006). These indicators were designed to capture the condition of other houses and buildings in the neighborhood, the amount of noise, the quality of the air, the conditions of streets, and the condition of yards and sidewalks in front of structures in the neighborhood. A high score on these measures represents more dilapidated or run-down conditions ($\alpha = .96$). Having the interviewer, and not the respondent, answer on neighborhood conditions is useful because older people tend to provide overly positive ratings of their own neighborhoods (Christensen, Carp, Kranz, & Wiley, 1992). Although the interviewers had no special training to assess these neighborhoods, we contend this is a useful measure for two reasons. First, this measure has excellent reliability, and a

Table 1. Core Study Measures

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1. Self-reported health (Wave 1 and Wave 2)^a
 - A. How would you rate your overall health at the present time?
 - B. Would you say your health is better, about the same, or worse than most people your age?
 - C. Do you think your health is better, about the same, or worse than it was a year ago?
 2. Alcohol use (Wave 1)
 - A. Do you ever drink beer, wine, or liquor (yes/no)?
 3. Number of chronic conditions (Wave 2)^b
 - A. This measure was constructed by summing the number of chronic conditions (range 0–12).
 4. Forgiveness of others (Wave 1 and 2)
 - A. How often do you forgive others for things they have done to you?^c
 - B. How often do you hold a grudge?^d
 - C. How often do you feel resentful toward others for things they have done?^d
 - D. How hard is it for you to forgive others?^e
 5. Neighborhood deterioration as rated by the interviewer (Wave 1 and 2)^f
 - A. The conditions of other housing and buildings in the neighborhood.
 - B. The amount of noise from traffic, trains, airplanes, industry, and things like that.
 - C. The quality of the air—the amount of population dirt or fumes in the air.
 - D. The conditions of the streets and roads in the neighborhood.
 - E. Condition of the yard and sidewalks in front of the structure.
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Notes. ^aA was scored in the following manner (coding in parentheses): Poor (1), Fair (2), Good (3), Excellent (4). B and C were scored in the following manner (coding in parentheses): Worse (1), About the Same (2), Better (3).

^bHave experienced any of the following health problems during the past 12 months (yes/no): arthritis or rheumatism; cataracts, glaucoma, or other eye diseases; asthma, emphysema, chronic bronchitis, tuberculosis, or other respiratory diseases; hypertension or taken medication for hypertension; heart attack or other heart trouble; diabetes, high blood sugar, or taken medication for diabetes; ulcers or other stomach or intestinal disorders; liver disease; kidney disease; other urinary tract disorders; cancer or malignant tumor; other major health problem.

^cThis item was scored in the following manner (coding in parentheses): Never (1), Once in a while (2), Fairly often (3), Very often (4).

^dThese items were scored in the following manner (coding in parentheses): Very often (1), Fairly often (2), Once in a while (3), Never (4).

^eThis item was scored in the following manner (coding in parentheses): Extremely hard (1), Somewhat hard (2), A little hard (3), I forgive others easily (4).

^fThese items were scored in the following manner (coding in parentheses): Excellent (1), Good (2), Fair (3), Poor (4).

principle components factor analysis demonstrated that all items loaded highly on one underlying factor (all factor loadings are >0.71). Second, this scale was highly correlated with variables that are theoretically linked to neighborhood deterioration such as education and financial strain. Forgiveness and neighborhood deterioration scales were centered on the mean.

We control for religious attendance to ensure that religious involvement does not confound the relationship between forgiveness and health. The level of religious attendance was measured via an item asking, “How often do you attend religious services” with responses ranging from “never” to “several times a week.” This variable was collapsed into four dummy variables including categories identifying those who never attend and those who attend regularly. Financial strain, as a proxy measure for socioeconomic status, was measured using the average of two items. The first asked, “How much difficulty do you have meeting the monthly payments on (your/your family’s) bills?” Responses varied from (1) “none” to (4) “a great deal.” This item was transformed to give a range of 1–3 to make the number of response categories consistent across items. The second item asked, “In general, how do (your/your family’s) finances work out at the end of the month?” Responses varied from (1) “money left over” to (3) “not enough to make ends meet.” Variables for self-reported health at baseline, age, education, self-esteem, and marital status were also included. Age and education were measured in years. Marital status was gauged through a dummy variable indicating if

the respondent was married. Self-esteem was comprised of three items: I feel I am a person of worth, or at least on an equal plane with others; I feel I have a number of good qualities; and I take a positive attitude toward myself. Responses ranged from (1) “strongly disagree” to (4) “strongly agree” ($\alpha = .90$).

Analytical Strategy

In order to test the proposed hypotheses, we employ a separate analysis for each dependent variable. Each analysis consists of three models. The first model includes covariates and forgiveness, the second adds neighborhood deterioration as a main effect, and the third tests for an interaction effect between forgiveness and neighborhood deterioration. For the analysis examining how forgiveness relates to self-reported health, we employ lagged ordinary least squares (OLS) regression models. For the analysis on alcohol use, we utilize logistic regression. When analyzing how forgiveness relates to the number of chronic conditions, we utilize negative binomial regression.

Because this sample consists of older adults, self-reported health at Wave 1 is highly predictive of whether or not the respondent is in the sample at Wave 2. In order to ensure our models are not confounded by the unhealthiest not being reinterviewed, we employed Heckman models, which utilize probit regression in analyses. The probit regression predicts to what extent the covariates are related to a reinterview at Wave 2 and adjusts the regression models accordingly via

Table 2. Sample Characteristics of Respondents by Race for Key Variables

	Blacks (N = 436)		Whites (N = 500)		t test by race
	Mean (SD)	Range	Mean (SD)	Range	
Self-reported health _{t=1}	2.19 (0.44)	1.00–3.00	2.25 (0.42)	1.00–3.00	2.13*
Self-reported health _{t=2}	2.06 (0.51)	1.00–3.00	2.16 (0.50)	1.00–3.00	2.49*
Alcohol use _{t=1} ^b	0.22 (0.41)	0.00–1.00	0.40 (0.49)	0.00–1.00	5.67***
Number of chronic conditions _{t=2}	2.59 (1.52)	0.00–8.00	2.39 (1.68)	0.00–10.00	1.51
Forgiveness _{t=1} ^a	0.12 (0.51)	–2.40 to 0.71	–0.13 (0.56)	–2.40 to 0.60	6.35***
Forgiveness _{t=2} ^a	0.11 (0.55)	–2.43 to 0.57	–0.09 (0.76)	–2.43 to 0.57	5.44***
Neighborhood deterioration _{t=1} ^a	0.21 (0.63)	–1.79 to 2.02	–0.27 (0.60)	–1.06 to 1.94	11.20***
Neighborhood deterioration _{t=2} ^a	0.16 (0.56)	–1.09 to 5.91	–0.16 (0.57)	–1.09 to 5.91	7.89***

Note. SDs are reported in parentheses.

^aIndicates that this variable was centered on the mean before separating Blacks and Whites.

^bMean values are reported for all variables with the exception of “alcohol use,” which is reported as a proportion.

*p ≤ .05; ***p ≤ .001 (two tailed).

the inverse Mills ratio. In order to run the probit regression, a dummy variable was created that assigns a “1” for those successfully reinterviewed and a “0” for all people not reinterviewed including those who refused to be reinterviewed. In addition, those who were in a nursing home, too sick to participate, or deceased at the time of the interview were identified and assigned to the zero category.

We included interaction terms to test if neighborhood deterioration moderates the effect of forgiveness. Because a cross-tabulation of forgiveness and neighborhood deterioration revealed some small cell sizes, tests for statistical leverage were performed. A postestimation of Cook’s distance (maximum value = 0.17) revealed that no single case had any meaningful impact upon the results presented here. Also, because we imputed missing values for neighborhood deterioration, we replicated its main and interaction effects using only nonmissing data. The results of these models did not differ meaningfully from those presented here. Moreover, although we favor stratifying the sample by race and employing two-way interactions because it does not assume equality of other covariates, we tested three-way interactions in ancillary analyses. These ancillary analyses paralleled the substantive findings reported in the text.

RESULTS

Table 2 shows the means or percentages of key dependent and independent variables for Blacks and Whites. Overall, Blacks were disadvantaged with respect to self-reported health, number of chronic conditions, and neighborhood deterioration. However, Whites reported higher alcohol use. Blacks reported higher levels of interpersonal forgiveness at both waves. Overall, the differences in means for all key variables suggest that the relationship between forgiveness and health may differ by race.

Table 3 presents the lagged OLS regression models testing how forgiveness affects self-reported health. A t test between models tests for racial differences in the regression coefficients. This table presents three notable patterns. First, forgiveness positively predicts self-reported health at Wave 2 net of self-reported health at Wave 1 for Blacks. Second, the main effect of neighborhood deterioration is not significantly related to self-reported health for Blacks or Whites. Third, the interaction term between forgiveness and neighborhood deterioration is negative and statistically significant for Blacks. The t tests across models confirm that the main and interaction effects associated with forgiveness are statistically different for Blacks and Whites. Overall, this analysis provides modest support for H1.

Table 3. Lagged Regression of Self-Reported Health_{t=2} on Forgiveness and Neighborhood Deterioration by Race^a

	Blacks (N = 436)			Whites (N = 500)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Self-reported health _{t=1}	0.322*** ^b (0.053)	0.321*** ^b (0.053)	0.328*** ^b (0.053)	0.452*** ^b (0.050)	0.454*** ^b (0.050)	0.454*** ^b (0.050)
Forgiveness _{t=1}	0.086* ^b (0.046)	0.085* ^b (0.047)	0.138*** ^b (0.050)	–0.008 ^b (0.039)	–0.007 ^b (0.039)	–0.010 ^b (0.041)
Neighborhood deterioration _{t=1}	—	–0.009 (0.041)	0.013 (0.041)	—	0.009 (0.037)	0.007 (0.038)
Forgiveness _{t=1} × neighborhood deterioration _{t=1}	—	—	–0.199*** ^b (0.072)	—	—	–0.016 ^b (0.072)
R ²	0.17	0.17	0.18	0.21	0.21	0.21

Note. Unstandardized coefficient (standard error).

^aAll models are adjusted for selection and include controls for age, education, marital status, gender, religious attendance, self-esteem, and financial strain.

^bIndicates that the regression coefficient is statistically different for Blacks and Whites at the p < .05 (one tailed) level.

*p ≤ .05; **p ≤ .01; ***p ≤ .001 (one tailed).

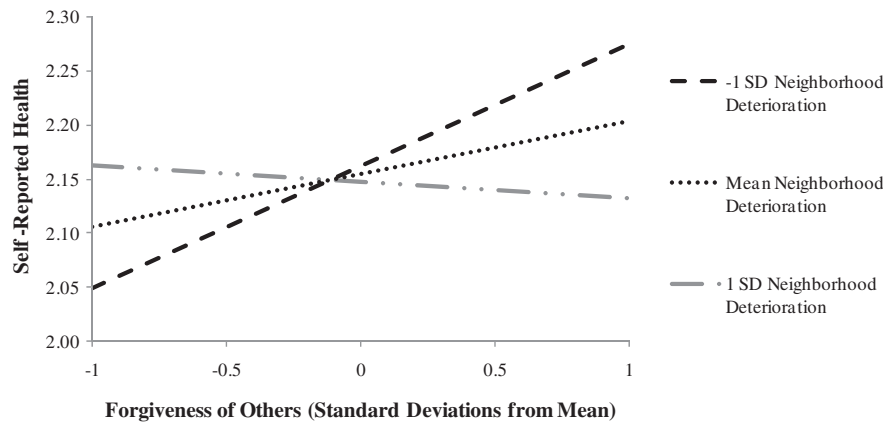


Figure 1. Self-reported health by forgiveness and neighborhood deterioration among Blacks 66–95 years old.

Figure 1 presents a graphical display of the relationship between self-reported health, forgiveness, and neighborhood deterioration to better understand the nature of the significant interaction between forgiveness and neighborhood deterioration among Blacks. Neighborhood deterioration was broken down into three categories: low, medium, and high, which correspond to one *SD* below the mean, the mean, and one *SD* above the mean, respectively. Similarly, the level of forgiveness is displayed on the *x*-axis as *SDs* from the mean. This figure displays three important patterns. First, individuals living in the least deteriorated neighborhoods show increasing levels of self-reported health with increasing levels of forgiveness of others. Second, among those living in areas with average levels of deterioration, reported health also increases with increases in forgiveness but at a slower rate (i.e., the positive slope is less steep than those with the least deteriorated neighborhoods). Third, those living in highly deteriorated neighborhoods witness a negative relationship between health and forgiveness of others. This negative relationship implies that, “among those living in the most run-down neighborhoods,” those with a strong tendency toward forgiveness have worse health than those with a tendency not to forgive. This figure suggests that the effect of forgiveness on self-reported health is contingent upon the neighborhood in which one lives. Based on this interaction effect, we find support for H2 that those in more deteriorated neighborhoods may not receive the health

benefits from forgiveness that those in less deteriorated neighborhoods receive.

Table 4 presents logistic regressions showing the relationship between the likelihood of alcohol use and forgiveness. Higher levels of forgiveness are associated with a lower likelihood of alcohol use for Blacks but not Whites. The odds ratio for forgiveness corresponds to a 54% decrease in the likelihood of having used alcohol with a unit increase in forgiveness among Blacks. A chi-square test (of the regression coefficients) across models confirms that the influence of forgiveness on the likelihood of alcohol use is greater for Blacks than Whites. Forgiveness does not significantly interact with neighborhood deterioration among Blacks or Whites in its effect on alcohol use. Based on these results, we find strong support for H1 but not support for H2.

Table 5 shows the relationship between the number of chronic conditions and forgiveness. This table shows that forgiveness is negatively related to the number of chronic conditions for Blacks but not Whites. A unit increase in forgiveness is associated with about a 10% decrease in the expected count of chronic conditions. Although the effect of forgiveness is statistically significant for Blacks but not Whites, the difference between the Black and the White forgiveness coefficients is not statistically significant. Moreover, the forgiveness by neighborhood deterioration interaction term is not significant among Blacks or Whites.

Table 4. Logistic Regression of Alcohol Use_{*t*=1} on Forgiveness and Neighborhood Deterioration by Race

	Blacks (<i>N</i> = 436)			Whites (<i>N</i> = 500)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Forgiveness _{<i>t</i>=1}	0.459** ^a (0.259)	0.454** ^a (0.261)	0.466** (0.281)	0.900 ^a (0.184)	0.894 ^a (0.185)	0.927 (0.196)
Neighborhood deterioration _{<i>t</i>=1}	—	0.919 (0.230)	0.923 (0.231)	—	0.904 (0.178)	0.932 (0.186)
Forgiveness _{<i>t</i>=1} × neighborhood deterioration _{<i>t</i>=1}	—	—	0.905 (0.388)	—	—	1.121 (0.337)

Notes. Odds ratio (standard error). All models are adjusted for selection and include controls for age, education, marital status, gender, religious attendance, self-esteem, and financial strain.

^aIndicates that the regression coefficient is statistically different for Blacks and Whites at the $p < .05$ (one tailed) level based on a chi-square test.

** $p \leq .01$. (one tailed).

Table 5. Negative Binomial Regression of Number of Chronic Conditions_{*t*=2} on Forgiveness and Neighborhood Deterioration by Race

	Blacks (<i>N</i> = 436)			Whites (<i>N</i> = 500)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Forgiveness _{<i>t</i>=1}	0.898* (0.055)	0.897* (0.055)	0.876 [†] (0.248)	0.977 (0.057)	0.972 (0.056)	0.980 (0.190)
Neighborhood deterioration _{<i>t</i>=1}	—	1.009 (0.055)	1.007 (0.059)	—	1.079 (0.054)	1.079 (0.054)
Forgiveness _{<i>t</i>=1} × neighborhood deterioration _{<i>t</i>=1}	—	—	1.011 (0.111)	—	—	0.996 (0.091)

Notes. Odds ratio (standard error). All models are adjusted for selection and include controls for age, education, marital status, gender, religious attendance, self-esteem, and financial strain. The regression coefficients are statistically different for Blacks and Whites at the $p < .05$ (one tailed) level based on a chi-square test.

[†] $p \leq .10$; * $p \leq .05$. (one tailed).

Based on these results, we find modest support for H1 and no support for H2.

DISCUSSION

This study examined the impact of race and neighborhood on the relationship between forgiveness and health. We hypothesized: (a) that forgiveness would be especially important for the health of Blacks and (b) that the positive effect of forgiveness on health would be greater among those living in the least deteriorated neighborhoods. In accordance with hypothesis 1, forgiveness of others was associated with better health regarding self-reported health, alcohol use, and number of chronic conditions for Blacks but not for Whites. We found partial support for hypothesis 2. The influence of forgiveness on self-reported health was moderated by neighborhood deterioration such that those living in deteriorated neighborhoods did not witness the same salubrious effects of forgiveness as those living in less deteriorated neighborhoods.

The positive relationship between forgiveness and health for Blacks may be related to forgiving individuals being especially likely to be a part of extended family networks and religious communities. Evidence suggests that Blacks rely more on extended family in day-to-day matters and are more religious than their White counterparts (Krause, 2002; Sarkisian & Gerstel, 2004). Both extended family networks and involvement in the Black church can provide a shield from the social and economic disadvantages that commonly erode health and well-being. Extended families play a crucial role in providing comfort when faced with serious problems, assisting family members seeking employment, and helping elderly adults with health problems (Taylor & Chatters, 1991). Likewise, the Black church provides social support as well as psychosocial resources, such as optimism and meaning in life, that are protective over health (Krause, 2008). The role of interpersonal forgiveness may be central to maintaining extensive family ties and to religious involvement. Being forgiving is integral to maintaining important social ties as a lack of forgiveness in the presence of conflict can easily lead to the dissolution of beneficial familial and church-based personal relationships.

Living in a deteriorated neighborhood is thought to be detrimental to health for several reasons such as lack of

community resources and trust and increased exposure to stress and toxins (Kawachi & Berkman, 2003). This study, however, provides a new avenue by which noxious neighborhoods can negatively affect health. Negative neighborhoods can blunt the efficacy of forgiveness and possibly other psychological factors that would normally be protective of health. In other words, deteriorated neighborhoods can be harmful because the social and psychological factors that are typically protective of health and well-being may be muted in such noxious environments. This is in line with McCullough's (2008) predictions about social context and forgiveness, and to our knowledge, this research is the first empirical test to find support for this theory.

Although forgiveness was found to be less effective in highly deteriorated neighborhoods, we emphasize that future studies should replicate these findings as the argument that forgiveness could be especially useful in these neighborhoods is also feasible. For instance, neighborhood deterioration among older adults is positively related to anger for residents who feel financially disadvantaged or perceive neighborhood problems (Schieman, Pearlin, & Meersman, 2006). Anger, in turn, shares a strong relationship with a number of deleterious health outcomes including coronary heart disease and physical and cognitive functioning (Smith, Glazer, Ruiz, & Gallo, 2004). Forgiveness of others has been found to decrease anger and chronic blaming (Thoresen et al., 2000) and thus could theoretically be beneficial in noxious social environments.

The finding that forgiveness of others was unrelated to health among Whites was unexpected given that past studies employed mostly White samples. There are at least five potential explanations for this disparity. First, most of the work on forgiveness and health comes from convenience samples that are not representative of the broader population. Second, the literature is based on different age groups, and relatively little attention has been given to older adults. Third, there is a large degree of heterogeneity in how forgiveness is measured across studies that could produce differing results. Fourth, much of the forgiveness and health literature pertains to physiological reactivity, acute health issues, and illness symptoms and not more persistent dimensions of health. Fifth, previous studies that ignored race differences may have underestimated the forgiveness–health association by generalizing to Whites and Blacks as

a whole when, in fact, the effect may have been stronger for Blacks.

This study was based upon older adults in United States and provides additional impetus for several related areas of study. First, future studies should explore the relationship between forgiveness and health at various points in the life course. The health benefits of forgiveness likely build cumulatively over time, but we have little knowledge as to how this relationship unfolds. For example, how will the health of an older Black adult living in a deteriorated neighborhood who maintained a high level of forgiveness since early adulthood compare with someone of the same age who developed a high level of forgiveness in midlife?, does forgiveness in young adulthood confer any health advantages?, or does forgiveness not become important until later stages in life? Without life course-based study designs, we will not be able to answer such important questions. Second, future work should investigate how forgiveness influences specific health outcomes such as hypertension or heart disease. Forgiveness is thought to alter health through specific pathways; therefore, as some evidence suggests, forgiveness may be more relevant to conditions such as cardiovascular health (Toussaint & Cheadle, 2009; Whited, Wheat, & Larkin, 2010). Third, social relationships are thought to at least partially mediate the association between forgiveness and health. We have argued that this is probably more so the case for Blacks in disadvantaged contexts. Future work should test for these mediating relationships using a variety of health outcomes. Finally, McCullough (2008) highlights how the propensity to forgive may be influenced by genetic tendencies. Future work should implement genetically informed research designs to specifically test for genetic-social interactions between forgiveness and the social environment in which people live.

There are several limitations that deserve mention. First, forgiveness and neighborhood deterioration could have been measured in different ways. For instance, after the initial wave of data collection for this study, other equally efficient measures of interpersonal forgiveness that have better psychometric properties were developed (e.g., Brown, 2003). Second, neighborhood social disorder (a measure not available in these data), based on our theoretical argument, may actually be more relevant for forgiveness than the physical properties of the neighborhood. Third, our dichotomous measure of alcohol use is far from ideal. Future work should employ data sets with enough cases to explore how forgiveness is related to heavy alcohol consumption. Fourth, the data used in this study did not include persons who practice non-Christian religions. Although we suspect the benefits of forgiveness extend to those in other religions, this cannot be inferred from our data.

The social context of both race and neighborhood appears to condition the effects of forgiveness on health. Although Blacks experience potentially salutary effects of forgiveness, deteriorated neighborhood conditions negate

them. Further still, it is for Blacks in the least deteriorated conditions for which forgiveness may have the most beneficial effects on health. These effects of forgiveness have not been previously given rigorous consideration. Our findings suggest that such factors as race and neighborhood may be critically important to understand the forgiveness-health relationship. With continued attention to such issues, our understanding will continue to grow regarding when and where forgiveness may be most beneficial and how we might intervene at appropriate times and places.

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CORRESPONDENCE

Correspondence should be addressed to Michael J. McFarland, MA, Department of Sociology, University of Texas, Austin, TX 78705. E-mail: mmcfarland@prc.utexas.edu.

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