



# Do Religious Struggles Mediate the Association Between Neighborhood Disorder and Health in the United States?

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## Abstract

Over the past two decades, numerous studies have linked the subjective experience of neighborhood disorder (perceptions of crime, dilapidation and ambient strains) with poorer health. We test whether religious struggles (religious doubts and feeling abandoned or punished by God) mediate this association. Our counterfactual mediation analyses of data from the 2021 *Crime, Health, and Politics Survey* (CHAPS) ( $n = 1741$ ) revealed consistent indirect effects of neighborhood disorder through religious struggles for anger, psychological distress, sleep disturbance, poorer self-rated health, and shorter subjective life expectancy. This study contributes to previous work by integrating the study of neighborhood context and religion.

**Keywords** Neighborhood disorder · Religious struggles · Anger · Mental health · Sleep, health · Subjective life expectancy

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## Introduction

Over twenty years ago, sociologists Catherine Ross and John Mirowsky (1999, p. 414) defined perceived neighborhood disorder as “conditions and activities—both minor and major, noncriminal and criminal—that residents perceive to be cues or signs of the breakdown of social control.” Since then, numerous studies have linked the subjective experience of neighborhood disorder with *poorer* population health (Assari, 2017; Carbone, 2020; Chen-Edinboro et al., 2015; Christie-Mizell et al., 2003; Coimbra et al., 2022; DeSantis et al., 2016; Feldman & Steptoe, 2004; Hill, Ross, & Angel, 2005; Hill & Angel, 2005; Hill et al., 2009; Hill & Maimon, 2013; Hill et al., 2016; Hunter & Hayden, 2018; Jang & Johnson, 2001; Johnson et al., 2016; Krause, 1998; Krause et al., 2017a, 2017b; Miles, 2006; O’Brien et al., 2019; Ross, 2000; Ross & Mirowsky, 2001, 2009; Schieman & Meersman, 2004; Schieman et al., 2006; Schulz et al., 2013; van Deurzen et al., 2016; Wen et al., 2006). The disorder-health association is remarkable in the sense that it has been replicated across various indicators of neighborhood disorder (perceptions of crime, dilapidation, and other ambient strains) and a wide range of health-related outcomes, including mental health (e.g., anger, anxiety, and depression), health behavior (e.g., smoking, substance abuse, and sleep disturbance), physical health (e.g., lower self-rated health, disability, hastened cellular aging, and allostatic load), and mortality risk (e.g., all-cause and cause-specific).

Living in neighborhoods with social disorder (e.g., open consumption of alcohol and illicit drugs, crime, and violence), physical disorder (e.g., abandoned buildings, waste, and vandalism), and other ambient strains (e.g., noise pollution and unpleasant odors) is thought to undermine health and longevity through processes related to stress, health behavior, and psychosocial functioning (Assari, 2017; Feldman & Steptoe, 2004; Hill, Ross, & Angel, 2005; Hill & Maimon, 2013; O’Brien et al., 2019; Ross & Mirowsky, 2001, 2009). First and foremost, neighborhood disorder contributes to stress by exposing residents to conditions they personally define as dangerous or problematic. When these conditions are experienced as a way of life, residents risk chronic activation of the stress response (i.e., chronic stress) and widespread physiological “wear and tear” on the autonomic nervous system, the hypothalamic–pituitary–adrenal axis, and the cardiovascular, metabolic, and immune systems (i.e., allostatic load) (Carbone, 2020; Schulz et al., 2013; van Deurzen et al., 2016). The mixture of constant stress with observable signs that social control is weak (e.g., graffiti and crime) and risky sociocultural environments (e.g., noise, public intoxication, and recreational/food deserts) then increases the likelihood that residents will engage in “tension reduction” processes by adopting generally unhealthy lifestyles that are characterized by substance use and sleep disturbance (Hill & Maimon, 2013; Hunter & Hayden, 2018; O’Brien et al., 2019). Disorder also undermines psychosocial functioning by socially isolating and disintegrating residents through processes related to fear of crime and generalized mistrust (Hill et al., 2013). Self-esteem is challenged when supportive social relations are disrupted and

the stigma of “impoverished and deteriorating surroundings are internalized and incorporated into an individual’s self-image” (Haney, 2007: 992). Finally, over time, residents learn to generalize the sense of powerlessness they feel with respect to the noxious, unpredictable, and seemingly inescapable conditions of disorder to other areas of their lives (Ross & Mirowsky, 2009).

Although previous work has made significant contributions to our understanding of the processes underlying neighborhood disorder and population health, we argue that the literature could be advanced by further integration with the study of religion and health. There is some evidence to suggest that the association between physical disorder (based on interviewer ratings) and physical health (self-rated health and hypertension) can be moderated or buffered by positive religious coping (perceptions of strength, comfort, and support from God and prayer) and God-mediated control (beliefs about collaborating with God to control the outcomes of life) (Krause, 1998; Krause et al., 2017a, 2017b), but little is known about the potential mediating influence of religious struggles.

Religious struggles are important because they represent a unique facet of the religious experience that captures “tension and conflict about sacred matters within oneself, with others, and with the supernatural” (Stauner et al., 2016, p. 1). Along these lines, Exline et al. (2014) describe three general dimensions of religious struggles, including (1) the interpersonal, (2) the intrapersonal, and (3) the divine and demonic. Interpersonal struggles are religious-based conflicts with family, friends, and other relations within one’s religious group and community. Intrapersonal struggles are intrapsychic battles with one’s own internalized morality standards, religious doubts, and quest for meaning and purpose in life. Divine and demonic struggles refer to ominous beliefs about and strained relationships with God, the Devil, and other spiritual powers or evil spirits.

Our focal hypothesis, that neighborhood disorder could undermine health by contributing to the experience of religious struggles, flows from the strain-struggles-distress (S–S–D) model developed by Hill et al. (2017). The S–S–D model has two principle components. The first component (S–S) suggests that stressful experiences can lead to religious struggles. Magyar-Russell and Pargament (2006, p. 102) note that “...negative life events, loss, and trauma often shatter previously held assumptions about the benevolence, fairness, and meaningfulness of the world. For many, this shattering of assumptions extends to the spiritual dimension of their lives.” While many people turn to religion for guidance and comfort to cope with adversity, others turn away from their faith and deeply held religious beliefs when they can no longer make coherent religious sense of their lives. Indeed, several studies have linked higher levels of religious struggles with a range of strains, including adverse health conditions, disability, financial difficulties, discrimination, the outcomes of presidential elections, and other stressful or traumatic life events (Ai et al., 2010; Ellison & Lee, 2010; Exline et al., 2011, 2021a; Fitchett et al., 2004; Gall et al., 2009; Hill et al., 2017; Koenig et al., 1998; Krause & Hayward, 2012; Krause et al., 2017a, 2017b; Pargament et al., 1998; Stauner et al., 2019; Wortmann et al., 2011).

Following this work, our central argument is that the stress and insecurity associated with the subjective experience of neighborhood disorder could conceivably lead to religious doubts and negative religious coping by challenging core religious

beliefs and raising existential questions about the benevolence of God, fairness in the world that is bestowed on the faithful, and the sense of meaning that accompanies religious dedication: How can I live in these conditions when I am a person of faith? If God loves me, why do I suffer in this place? Is God punishing me? Has God abandoned me? Does God even exist? Although previous research has reported no association between physical disorder (e.g., the condition of neighborhood buildings and roads) and religious struggles (e.g., feeling abandoned and punished by God) (Krause et al., 2017a, 2017b), the effects of broader indicators of neighborhood disorder (including social disorder) have yet to be explored.

The second component of the original model (S–D) suggests that religious struggles then contribute to psychological distress. To accommodate more inclusive conceptualizations of health, we draw on the broader study of religious struggles and health to propose a strain-struggles-health (S–S–H) model. Although most studies of religion and health focus on the health benefits (Koenig et al., 2012), there is a growing body of research linking various indicators of religious struggles (e.g., religious doubts, punitive God images, and negative religious coping) with poorer mental (e.g., anger, depression, and suicidal ideation) and physical (e.g., suppressed immune function, disability, and lower self-rated health) health, risky health behavior (unhealthy diets, substance abuse, and lower sleep quality), and higher mortality risk (Ai et al., 2010; Bockrath et al., 2022; Cowden et al., 2022; Ellison & Lee, 2010; Ellison et al., 2011; Faigin et al., 2014; Hill et al., 2021; Ironson et al., 2011; Krause & Ellison, 2009; Krause & Wulff, 2004; Pargament et al., 2001, 2004; Park et al., 2011; Silton et al., 2014; Upeniek, 2021, 2022; Wilt et al., 2022). The most common explanations for why religious struggles tend to undermine health emphasize unique stress processes associated with “intrapsychic” strains (e.g., nagging reservations about matters of faith and perceived moral or spiritual injustice), the loss of psychosocial resources (e.g., social support, identity, self-esteem, and meaning in life), and the emotional distress (e.g., fear, uncertainty, and hopelessness) that stems from interpersonal (e.g., strained relationships and ideological divisions within religious communities), intrapersonal (e.g., internalization of stigma associated with deviating from religious norms), and divine/demonic (e.g., the loss of security and coherence from strained divine relations) struggles (Ellison & Lee, 2010; Exline, 2002; Hill et al., 2021; Magyar-Russell et al., 2006; Pargament et al., 1998; Upenieks, 2021).

In accordance with the S–S–H model, we expect that neighborhood disorder will contribute to poorer health outcomes by inspiring religious struggles. People who live in neighborhoods characterized by disorder and danger will tend to report more religious and spiritual struggles because these conditions threaten the security and coherence of one’s religious experience. In turn, these struggles are likely to elicit feelings of anger (e.g., from a sense of cosmic injustice), symptoms of depression and anxiety (e.g., feelings of hopelessness and fear derived from a loss of religious meaning and precarious divine relations), sleep disturbance (e.g., from the emotional distress and constant mental labor associated with religious doubting and punitive images of God), poor overall physical health (e.g., from the emotional and physiological wear and tear of existential crises), and, ultimately, lower subjective

life expectancy or realistic and personalized expectations of life based on the cumulative toll of religious struggles, stress, distress, and risky health-related behavior.

## Methods

### Data

To test our mediation hypothesis, we use data from the 2021 *Crime, Health, and Politics Survey* (CHAPS) (Hill, 2021). The primary purpose of CHAPS is to document the social causes and social consequences of various indicators of health and well-being in the United States during the coronavirus (COVID-19) pandemic. CHAPS is based on a national probability sample of 1,771 non-institutionalized adults aged 18 and over living in the United States. Respondents were sampled from the National Opinion Research Center's (NORC) AmeriSpeak© panel, which is representative of households from all 50 states and the District of Columbia (AmeriSpeak, 2022). Sampled respondents were invited to complete the online survey in English between May 10, 2021 and June 1, 2021. The data collection process yielded a survey completion rate of 30.7% and a weighted cumulative response rate of 4.4%. The weighted cumulative response rate, which considers all panel recruitment and retention rates, is the overall survey response rate that accounts for survey outcomes in all response stages, including the panel recruitment rate, panel retention rate, and survey completion rate. It is weighted to account for the sample design and differential inclusion probabilities of sample members. Our cumulative response rate is within the typical range (4–5%) of high-quality general population surveys (see Pew Research Center, 2021). The multistage probability sample resulted in a margin of error of  $\pm 3.23\%$  and an average design effect of 1.92. Margin of error is defined as half the width of the 95% confidence interval for a proportion estimate of 50% adjusted for design effect. A figure of  $\pm 3.23\%$  is therefore the largest margin of error possible for all estimated percentages based on the study sample. A margin of error of  $\pm 3.23\%$  at the 95% confidence level means that if we fielded the same survey 100 times, we would expect the result to be within 3.23% of the true population value 95 times. Although a margin of error of 3.00 is considered to be very good and in line with conventional practices, a smaller margin of error would be indicative of more precise estimates (Cui, 2002). The average design effect is the variance under the complex design divided by the variance under a simple random sampling design of the same sample size. The design effect is variable-specific, and the reported value is the average design effect calculated for a set of key survey variables. Design effects account for deviations from simple random sampling with a 100% response rate. A design effect of 1.92 is very good because it means that the variance is only about twice as large as would be expected with simple random sampling (Kish, 1965). The median self-administered web-based survey lasted approximately 25 min. All respondents were offered the cash equivalent of \$8.00 for completing the survey, which is on the more lucrative end of the incentive spectrum for a survey of this duration. The survey was reviewed and approved by the institutional review board at

NORC and one other university review board. Informed consent was obtained from all participants.

## Measures

*Neighborhood disorder* is measured as the mean response to three items from the Perceived Neighborhood Disorder Scale (Mirowsky & Ross, 1999). These items assess perceptions of problems in the neighborhood, including social disorder, ambient strains, and structural disrepair. Respondents were asked to indicate the extent to which they agreed or disagreed with the following statements: “There is a lot of crime in my neighborhood.” “My neighborhood is noisy.” “My neighborhood is clean.” Response categories for these items ranged from (1) strongly agree to (5) strongly disagree. The “crime” and “noise” items were reverse-coded so that higher index would indicate greater perceptions of disorder. An exploratory principal components analysis with varimax rotation produced a single component (eigenvalue = 2.12), with loadings ranging from 0.82 to 0.86. A reliability analysis also suggested adequate internal consistency for three items ( $\alpha = 0.79$ ).

*Religious struggles* are measured as the mean response to three items drawn from the Religious and Spiritual Struggles Scale (Exline et al., 2014). Respondents were asked to indicate how often they (a) “have doubts about their religious or spiritual beliefs,” (b) “feel as though God has abandoned them,” and (c) “feel as though God is punishing them.” Response categories for these items ranged from (1) never to (5) always so that higher index scores would indicate more religious struggles. An exploratory principal components analysis with varimax rotation produced a single component (eigenvalue = 2.09), with loadings ranging from 0.76 to 0.89. A reliability analysis also suggested adequate internal consistency for three items ( $\alpha = 0.77$ ).

*Anger* is measured as the mean response to three items drawn from the How I Feel Instrument (Petersen & Kellam, 1977). Respondents were asked to indicate how often in the past 30 days they (a) “felt angry,” (b) “lost their temper,” and (c) “yelled at people.” Response categories for these items ranged from (1) never to (5) always so that higher index scores would indicate more anger. An exploratory principal components analysis with varimax rotation produced a single component for the three items (eigenvalue = 2.35), with loadings ranging from 0.86 to 0.93. A reliability analysis also suggested excellent internal consistency for three items ( $\alpha = 0.86$ ).

*Psychological distress* is measured as the mean response to six items drawn from the K6 Psychological Distress Scale (Kessler et al., 2002). Respondents were asked to indicate how often in the past 30 days they felt: (a) “nervous,” (b) “restless or fidgety,” (c) “so sad nothing could cheer them up,” (d) “hopeless,” (e) “everything was an effort,” and (f) “worthless.” Response categories for these items ranged from (1) never to (5) always so that higher index scores would indicate greater psychological distress. An exploratory principal components analysis with varimax rotation produced a single component for the three items (eigenvalue = 4.52), with loadings ranging from 0.83 to 0.91. A reliability analysis also suggested excellent internal consistency for six items ( $\alpha = 0.94$ ).

*Sleep disturbance* is measured as the mean response to four items drawn from previous research (Hill et al., 2020). Respondents were asked to indicate how often in the past month they (a) “had trouble falling asleep,” (b) “had trouble staying asleep (including waking up too frequently or too early),” and (c) “woke up after their usual amount of sleep feeling tired and worn out.” Response categories for these items ranged from (1) never to (5) always. Respondents were also asked to rate their “overall sleep quality in the past month” (Hill et al., 2009). Response categories for this item ranged from (1) excellent to (4) poor. All items were coded so that higher index scores would indicate greater sleep disturbance. An exploratory principal components analysis with varimax rotation produced a single component for the five items (eigenvalue = 2.60), with loadings ranging from 0.79 to 0.83. A reliability analysis also suggested adequate internal consistency for four items ( $\alpha = 0.82$ ).

*Self-rated physical health* is measured with a single item. This measure is correlated with physician assessments and other measures of morbidity and mortality risk (Idler & Benyamini, 1997). Respondents were asked how they would rate their “overall physical health at the present time.” Response categories for this item ranged from (1) poor to (5) excellent so that higher scores would indicate better self-rated health.

*Subjective life expectancy* is measured with a single item drawn from previous research (Mirowsky & Ross, 2000). Subjective life expectancy is correlated with self-rated health, chronic disease burden, and mortality risk (Griffin et al., 2013; Kim & Kim, 2017; Mirowsky & Ross, 2000; van Solinge & Henkens, 2018). Respondents were asked, “To what age do you expect to live?” Response categories for this item included discrete ages (top-coded at 100 years). We subtracted the respondent’s current age from their expected age of expiration (expected age of expiration—current age) so that higher scores would indicate longer subjective life expectancies.

To isolate the effects of religious struggles from foundational religious beliefs and behaviors, all multivariate analyses control for religious affiliation and general religiosity. *Religious affiliation* is measured with six dummy variables based on previous research (Steenland et al., 2000). These variables capture (a) conservative Protestants (those who reported being Protestant and evangelical/born again), (b) moderate Protestants (those who reported being Protestant without being evangelical/born again), (c) Catholics, (d) other Christians (e.g., those who reported being Mormon, Orthodox, or “just Christian”), (e) other religions (e.g., Jews, Buddhists, and Muslims), and (f) non-affiliates (those with no religious affiliation, including atheists and agnostics, serving as the reference). *Religiosity* is measured as the mean response to four items. Respondents were asked two questions about their public religious activities: (a) “How often do you usually attend church, synagogue, or other religious meetings?” (b) “How often do you usually attend church, synagogue, or other religious meetings remotely using a computer or phone?” Responses to these questions range from (1) never to (5) several times per week. Respondents were also asked about their private religious activities and the salience of religion in their lives: (c) “How often do you usually spend time in private religious activities such as prayer, meditation, or scriptural study?” (d) “How important is religion in your life today?” Responses to the private activities item range from (1) never to (7) more than once per day. Responses to the importance item range from (1) not important to

(5) very important. All items are coded so that higher scores would indicate greater religiosity. An exploratory principal components analysis with varimax rotation produced a single component (eigenvalue=2.77), with loadings ranging from 0.79 to 0.86. A reliability analysis also suggested excellent internal consistency for four items ( $\alpha=0.85$ ).

Our analyses also adjust for several potential sociodemographic correlates of our focal variables, including *age* (continuous years), *sex* (1=female; 0=male), *race/ethnicity* (dummy variables for non-Hispanic Black, Latino, and other races/ethnicities, with non-Hispanic White serving as the reference), *nativity status* (1=US-born; 0=otherwise), *urbanicity* (1=residence in a large city or town; 0=otherwise), *region* (dummy variables for Northeast, Midwest, and West, with South serving as the reference), *college degree* (1=four-year college degree or higher; 0=otherwise), *employment* (1=employed full- or part-time; 0=otherwise), *annual household income* (1=<\$10,000 to 9= $\geq$ \$150,000), *marital status* (1=married; 0=otherwise), *children* (1=presence of child under the age of 18; 0=otherwise), *neighborhood tenure* (1=less than 1 year to 5=11 years or more), and *perceived protection from local police* (1=strongly disagree to 5=strongly agree).

## Analysis

After using listwise deletion for missing data, our analytic sample size was reduced from 1,771 to 1,741. Post-stratification weights were used in supplemental analyses to assess sampling error and non-response bias. NORC developed post-stratification weights for CHAPS via iterative proportional fitting or raking to general population parameters derived from the Current Population Survey (2022). These parameters included age, sex, race/ethnicity, education, and several interactions (age\*sex, age\*race, and sex\*race).

Table 1 presents descriptive statistics for all study variables, including variable ranges, sample means, and standard deviations. In Table 2, we use ordinary least squares (OLS) regression to model religious struggles, anger, and psychological distress as a function of predictor variables. In Table 3, we use OLS to model sleep disturbance and self-rated health and negative binomial regression to model subjective life expectancy (years of life remaining). The flexible assumptions of the negative binomial regression model are generally superior to the highly restrictive assumptions of the Poisson regression model (Allison, 2012; Gardner et al., 1995). All regression models present unstandardized coefficients and two-tailed statistical tests.

To formally test the indirect effects of neighborhood disorder on health through religious struggles, we employ counterfactual mediation analysis (VanderWeele, 2015). The flexible *paramed* command in Stata 15 allows for the incorporation of estimates from linear and negative binomial regression models to accommodate continuous and count mediators and outcomes. In Table 4, we present natural indirect effects (estimates and *p*-values) and the proportion mediated. The natural indirect effect captures how much the outcome (Y) would change on average if the focal predictor (X) was held constant while the mediator (M) was allowed to vary. The proportion mediated measures the percent



**Table 1** Weighted descriptive statistics (*CHAPS* 2021)

	Range	Mean	SD
Neighborhood disorder	1–5	2.20	0.84
Religious struggles	1–5	1.81	0.80
Anger	1–5	2.25	0.87
Psychological distress	1–5	2.26	0.96
Sleep disturbance	1–5	3.02	0.84
Self-Rated Health	1–5	3.20	0.95
Subjective life expectancy	0–78	36.27	18.75
Age	18–94	47.86	17.59
Female	0–1	0.52	
Non-hispanic white	0–1	0.63	
Non-hispanic black	0–1	0.11	
Latino	0–1	0.17	
Other race/ethnicity	0–1	0.09	
US-Born	0–1	0.90	
Urban residence	0–1	0.29	
Northeast residence	0–1	0.17	
Midwest residence	0–1	0.21	
West residence	0–1	0.24	
Southern residence	0–1	0.38	
College degree	0–1	0.36	
Employed	0–1	0.59	
Household income	1–9	5.55	2.28
Married	0–1	0.53	
Presence of children	0–1	0.17	
Neighborhood tenure	1–5	3.72	1.35
Police protection	1–5	3.77	0.94
Conservative protestant	0–1	0.22	
Moderate protestant	0–1	0.12	
Catholic	0–1	0.19	
Other Christian	0–1	0.17	
Other religion	0–1	0.05	
No religious affiliation	0–1	0.25	
Religiosity	– 1.06 to 1.84	0.02	0.83

*n* = 1741

reduction in the effect of X on Y if the pathway from X to M was eliminated. Although survey weights are not currently supported within the *paramed* command, we note that the parameter estimates derived from this unweighted analysis are substantively identical to those obtained from our weighted regressions.

**Table 2** Weighted regressions of religious struggles, anger, and psychological distress (CHAPS 2021)

	Religious struggles		Anger		Psychological distress	
	(1)	(2)	(1)	(2)	(1)	(2)
	Neighborhood disorder	0.12 (0.05) **	0.19 (0.04) ***	0.16 (0.04) ***	0.17 (0.04) ***	0.13 (0.04) **
Religious Struggles			0.23 (0.03) ***			
Age	- 0.08 (0.04)	- 0.19 (0.04) ***	- 0.17 (0.04) ***	- 0.26 (0.04) ***	- 0.24 (0.04) ***	
Female	- 0.02 (0.06)	0.06 (0.06)	0.06 (0.06)	0.11 (0.06)	0.12 (0.06) *	
Non-Hispanic Black	- 0.22 (0.11)	0.10 (0.11)	0.15 (0.11)	- 0.37 (0.12) **	- 0.31 (0.11) **	
Latino	0.08 (0.10)	- 0.04 (0.09)	- 0.06 (0.08)	- 0.07 (0.09)	- 0.09 (0.09)	
Other Race/Ethnicity	0.02 (0.13)	0.18 (0.14)	0.18 (0.13)	- 0.14 (0.12)	- 0.15 (0.11)	
US-Born	- 0.11 (0.14)	- 0.21 (0.12)	- 0.18 (0.11)	- 0.16 (0.11)	- 0.12 (0.10)	
Urban Residence	- 0.04 (0.07)	- 0.10 (0.06)	- 0.09 (0.06)	- 0.06 (0.06)	- 0.05 (0.06)	
Northeast Residence	- 0.09 (0.10)	0.04 (0.09)	0.06 (0.09)	0.13 (0.11)	0.15 (0.11)	
Midwest Residence	- 0.04 (0.08)	0.03 (0.07)	0.04 (0.07)	0.003 (0.07)	0.02 (0.07)	
West Residence	- 0.22 (0.08) **	- 0.07 (0.08)	- 0.02 (0.08)	- 0.02 (0.07)	0.05 (0.07)	
College Degree	- 0.02 (0.06)	0.08 (0.05)	0.08 (0.05)	0.07 (0.06)	0.07 (0.06)	
Employed	- 0.06 (0.08)	- 0.09 (0.07)	- 0.08 (0.07)	- 0.28 (0.07) ***	- 0.27 (0.07) ***	
Household Income	0.01 (0.03)	- 0.04 (0.03)	- 0.04 (0.03)	- 0.01 (0.03)	- 0.02 (0.03)	
Married	- 0.21 (0.06) **	0.07 (0.06)	0.12 (0.06) *	- 0.17 (0.07) *	- 0.11 (0.06)	
Presence of Children	- 0.10 (0.09)	0.04 (0.10)	0.06 (0.10)	- 0.004 (0.09)	- 0.03 (0.09)	
Neighborhood Tenure	- 0.04 (0.03)	0.02 (0.02)	0.03 (0.02)	- 0.01 (0.02)	0.002 (0.02)	
Police Protection	- 0.01 (0.05)	- 0.07 (0.04)	- 0.07 (0.04)	- 0.17 (0.04) ***	- 0.17 (0.04) ***	
Conservative Protestant	0.13 (0.13)	0.01 (0.10)	- 0.02 (0.09)	0.16 (0.09)	0.13 (0.09)	
Moderate Protestant	0.12 (0.11)	- 0.01 (0.08)	- 0.04 (0.08)	0.01 (0.09)	- 0.02 (0.09)	
Catholic	0.16 (0.11)	- 0.10 (0.10)	- 0.14 (0.09)	0.02 (0.12)	- 0.03 (0.12)	
Other Christian	0.28 (0.13) *	0.03 (0.10)	- 0.03 (0.10)	0.09 (0.09)	0.01 (0.09)	
Other Religion	- 0.03 (0.17)	- 0.04 (0.21)	- 0.04 (0.20)	- 0.28 (0.17)	- 0.27 (0.16)	

Table 2 (continued)

	Religious struggles		Anger		Psychological distress	
	(1)	(2)	(1)	(2)	(1)	(2)
Religiosity	- 0.09 (0.04) *		- 0.02 (0.04)	0.001 (0.04)	- 0.09 (0.04) *	- 0.07 (0.04) *
Model R-Squared	0.08		0.15	0.21	0.25	0.31

*n* = 1741. Shown are unstandardized ordinary least squares regression coefficients with standard errors in parentheses (\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.001)

**Table 3** Weighted regressions of sleep disturbance, self-rated health, and subjective life expectancy (CHAPS 2021)

	Sleep disturbance		Self-rated health		Subjective life expectancy	
	(1)	(2)	(1)	(2)	(1)	(2)
Neighborhood Disorder	0.10 (0.03) **	0.08 (0.03) *	-0.06 (0.03)	-0.05 (0.04)	-0.02 (0.01)	-0.01 (0.01)
Religious Struggles		0.17 (0.03) ***		-0.11 (0.03) ***		-0.07 (0.01) ***
Age	-0.08 (0.04) *	-0.06 (0.04)	-0.01 (0.04)	-0.01 (0.04)	-0.48 (0.01) ***	-0.49 (0.01) ***
Female	0.20 (0.06) ***	0.21 (0.06) ***	-0.02 (0.06)	-0.02 (0.06)	0.01 (0.02)	0.01 (0.02)
Non-Hispanic Black	-0.13 (0.09)	-0.10 (0.09)	-0.17 (0.12)	-0.19 (0.12)	0.15 (0.04) ***	0.14 (0.04) ***
Latino	-0.01 (0.09)	-0.02 (0.09)	-0.03 (0.09)	-0.02 (0.09)	0.002 (0.03)	0.001 (0.03)
Other Race/Ethnicity	-0.12 (0.13)	-0.13 (0.13)	-0.03 (0.13)	-0.03 (0.13)	0.06 (0.04)	0.07 (0.04)
US-Born	-0.03 (0.06)	0.06 (0.11)	0.04 (0.12)	0.02 (0.12)	0.01 (0.04)	0.01 (0.04)
Urban Residence	-0.03 (0.06)	-0.01 (0.06)	-0.03 (0.06)	-0.03 (0.06)	0.01 (0.02)	0.004 (0.02)
Northeast Residence	0.05 (0.09)	0.07 (0.09)	-0.16 (0.09)	-0.16 (0.09)	0.001 (0.03)	-0.03 (0.03)
Midwest Residence	-0.05 (0.07)	-0.05 (0.07)	-0.11 (0.07)	-0.12 (0.07)	-0.01 (0.03)	-0.01 (0.03)
West Residence	-0.04 (0.07)	0.001 (0.07)	-0.13 (0.08)	-0.15 (0.08)	--0.01 (0.03)	-0.03 (0.03)
College Degree	-0.06 (0.06)	-0.06 (0.06)	0.15 (0.06) *	0.15 (0.06) *	0.07 (0.02) **	0.07 (0.02) **
Employed	-0.18 (0.06) **	-0.17 (0.06) **	0.33 (0.07) ***	0.32 (0.07) ***	0.11 (0.02) ***	0.11 (0.02) ***
Household Income	-0.04 (0.03)	-0.04 (0.03)	0.09 (0.03) **	0.09 (0.03) **	0.01 (0.01)	0.01 (0.01)
Married	-0.04 (0.06)	-0.01 (0.06)	0.04 (0.07)	0.02 (0.07)	0.03 (0.02)	0.02 (0.02)
Presence of Children	0.09 (0.07)	0.10 (0.07)	-0.18 (0.09) *	-0.19 (0.09) *	0.05 (0.03)	0.04 (0.02)
Neighborhood Tenure	0.000 (0.02)	0.01 (0.02)	-0.01 (0.02)	-0.02 (0.02)	0.002 (0.01)	0.000 (0.01)
Police Protection	-0.05 (0.03)	-0.05 (0.03)	0.05 (0.04)	0.04 (0.04)	0.02 (0.01)	0.01 (0.01)
Conservative Protestant	0.06 (0.09)	0.04 (0.09)	-0.16 (0.10)	-0.14 (0.10)	0.04 (0.04)	0.05 (0.04)
Moderate Protestant	0.004 (0.08)	-0.02 (0.08)	-0.08 (0.09)	-0.06 (0.09)	0.01 (0.03)	0.02 (0.03)
Catholic	0.10 (0.11)	0.07 (0.11)	0.01 (0.09)	0.03 (0.09)	0.04 (0.04)	0.05 (0.04)
Other Christian	0.08 (0.09)	0.03 (0.08)	-0.07 (0.10)	-0.04 (0.10)	0.03 (0.04)	0.04 (0.04)
Other Religion	0.06 (0.14)	0.07 (0.13)	0.18 (0.16)	0.18 (0.16)	-0.06 (0.05)	-0.06 (0.05)

Table 3 (continued)

	Sleep disturbance		Self-rated health		Subjective life expectancy	
	(1)	(2)	(1)	(2)	(1)	(2)
Religiosity	- 0.11 (0.03) **	- 0.09 (0.03) **	0.18 (0.04) ***	0.17 (0.04) ***	0.03 (0.01) *	0.03 (0.01) *
Model R-Squared	0.10	0.14	0.12	0.14	-	-

*n* = 1741. Shown are unstandardized ordinary least squares (sleep disturbance and self-rated health) and negative binomial (life expectancy) regression coefficients with standard errors in parentheses (\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ )

**Table 4** Counterfactual mediation analysis: indirect effects of neighborhood disorder through religious struggles (CHAPS 2021)

	Natural indirect effect	Proportion mediated (%)
Disorder → Struggles → Anger	0.05***	20.00
Disorder → Struggles → Psychological Distress	0.05***	26.32
Disorder → Struggles → Sleep Disturbance	0.03***	21.43
Disorder → Struggles → Self-Rated Health	− 0.02**	16.67
Disorder → Struggles → Life Expectancy	− 0.24**	18.05

$n = 1741$ . All natural indirect effects are adjusted for for age, sex, race, education, employment, household income, marital status, children, nativity, urban residence, region of residence, neighborhood tenure, perceived police protection, religious affiliation, and religiosity

(\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ )

## Results

### Descriptive Statistics

According to Table 1, respondents exhibited low mean levels of neighborhood disorder, religious struggles, anger, and psychological distress. The average respondent also reported moderate levels of sleep disturbance and “good” self-rated health. In terms of mean subjective life expectancy, respondents expected to live an additional 36 years. For context, our sample included respondents between the ages of 18 and 94. The mean age for the sample was 47.86.

### Direct Effects

In Tables 2 and 3, neighborhood disorder is positively associated with religious struggles, anger, psychological distress, and sleep disturbance. In other words, respondents who report more problems with crime, noise, and dilapidation in their neighborhoods also tend to report more religious doubts and strained divine relations, greater emotional torment, and more insomnia symptoms. In contrast, neighborhood disorder is not directly associated with self-rated health or subjective life expectancy in Table 3. However, in Tables 2 and 3, religious struggles are positively associated with anger, psychological distress, and sleep disturbance and inversely associated with self-rated health and subjective life expectancy. This suggests that respondents who struggle more with their religious beliefs and divine relations also tend to report poorer health (mental, physical, and sleep) and fewer expected years of life remaining. In the case of subjective life expectancy, the negative binomial regression coefficients can be exponentiated to reveal incidence rate ratios (IRR). IRRs are interpreted as the difference in the expected count of remaining years for each one-unit change in a predictor, while all other variables in the model are held constant. IRRs can be further manipulated ( $[\text{IRR} - 1] \times 100$ ) to describe the percent change in the expected year count

for each one-unit change in a predictor. For example, the IRR for religious struggles is 0.93 ( $e^{-0.07}$ ). This suggests that each unit increase in religious struggles reduces the expected count of remaining years by 7% ( $[0.93 - 1] \times 100$ ).

### Indirect Effects

Table 4 presents our counterfactual mediation analysis. These results are easily interpreted. The natural indirect effect (NIE) of neighborhood disorder through religious struggles was different from zero with respect to anger (NIE = 0.05,  $p < 0.001$ ), psychological distress (NIE = 0.05,  $p < 0.001$ ), sleep disturbance (NIE = 0.03,  $p < 0.001$ ), self-rated health (NIE = - 0.02,  $p < 0.01$ ), and subjective life expectancy (NIE = - 0.24,  $p < 0.01$ ). This suggests, for example, that anger scores would be an average of 0.05 units higher if neighborhood disorder was stably low (one standard deviation below the mean of disorder) and religious struggles scores were changed from the level it would typically take at low neighborhood disorder to the level it would take at high neighborhood disorder (one standard deviation above the mean of disorder). The proportion mediated also suggests that the magnitude of the association between neighborhood disorder and anger would be 20% lower if neighborhood disorder was unrelated to religious struggles. While the largest proportion mediated was observed with the association between neighborhood disorder and psychological distress, the smallest was observed for self-rated health. In other words, the religious struggles pathway may be more important for outcomes related to emotional distress and sleep disturbance than to physical health or subjective life expectancy.

### Supplemental Analyses

In supplemental analyses (not shown), we tested whether the effects of neighborhood disorder on religious struggles and health outcomes varied by neighborhood residential tenure, urbanicity, region, and perceived police protection. We tested 36 total interactions. While 34 of these interactions were null ( $p > 0.05$ ), 2 were statistically significant at conventional levels ( $p < 0.05$ ). None of the interactions of neighborhood disorder with neighborhood residential tenure and urbanicity were statistically significant. In other words, the effects of neighborhood disorder on religious struggles and health outcomes were comparable across exposure time in the neighborhood and for respondents who live in large cities or towns and less urban areas. For the most part, there were no variations by region or perceived police protection. There was some evidence that the association between neighborhood disorder and psychological distress was less pronounced in western states than in southern states ( $b = - 0.15$ ,  $p < 0.05$ ). There was also some indication that the association between neighborhood disorder and religious struggles was *more* (not less) pronounced at higher levels of perceived police protection ( $b = 0.10$ ,  $p < 0.05$ ).

## Discussion

In this paper, we proposed and tested the hypothesis that religious struggles would mediate the association between neighborhood disorder and health. Our counterfactual mediation analysis revealed consistent support for this hypothesis with respect to anger, psychological distress, sleep disturbance, self-rated health, and subjective life expectancy. To our knowledge, this is the first study to report an association between neighborhood disorder and religious struggles. For decades, scholars have argued that neighborhood disorder is likely to undermine health and longevity through processes related to stress, health behavior, and psychosocial functioning (Assari, 2017; Feldman & Steptoe, 2004; Hill & Angel, 2005; Hill & Maimon, 2013; O'Brien et al., 2019; Ross & Mirowsky, 2001, 2009). Building on previous work, our analyses suggest that religious struggles may also play a role in explaining why neighborhood disorder is often associated with poorer health. This evidence supports the prior strain-struggles-distress (S–S–D) model (Hill et al., 2017) and an even broader model that we define as strain-struggles-health (S–S–H).

Although we are primarily interested in the indirect effects of neighborhood disorder, the direct effects are also noteworthy. While previous studies have linked various strains (e.g., poor health, discrimination, and financial difficulties) with greater religious struggles (Ai et al., 2010; Ellison & Lee 2010; Exline et al., 2011; Exline et al., 2021a; Fitchett et al., 2004; Gall et al., 2009; Hill et al., 2017; Koenig et al., 1998; Krause & Hayward, 2012; Krause et al., 2017a, 2017b; Pargament et al., 1998; Stauner et al., 2019; Wortmann et al., 2011), we extend this body of work to the stressful conditions of neighborhood disorder. We also found that neighborhood disorder was associated with higher levels of anger, psychological distress, and sleep disturbance, which is consistent with previous studies (Chen-Edinboro et al., 2015; Christie-Mizell et al., 2003; DeSantis et al., 2016; Hill & Maimon, 2013; Hill et al., 2009, 2016; Hunter & Hayden, 2018; Johnson et al., 2016; Krause et al., 2017a, 2017b; O'Brien et al., 2019; Ross, 2000; Ross & Mirowsky, 2009; Schieman & Meersman, 2004; Schieman et al., 2006).

We failed to observe any direct effects of neighborhood disorder on self-rated health and subjective life expectancy. Although these null findings are inconsistent with earlier work (Assari, 2017; Hill, Ross, & Angel, 2005; Krause, 1998; Ross & Mirowsky, 2001; Wen et al., 2006), they are not incompatible with our indirect effects for self-rated health and subjective life expectancy. MacKinnon (2008, p. 68) explains that the direct effect of X on Y “is controversial because it is possible that the relation between the independent variable and the dependent variable may be nonsignificant, yet there can still be substantial mediation.” Hayes (2013, p. 88) has also argued that “mediation analysis as practiced in the twenty-first century no longer imposes evidence of simple association between X and Y as a precondition.” The key is that each link in our proposed mediation model is supported empirically. In other words, neighborhood disorder (X) is associated with religious struggles (M), and religious struggles (M) are associated with each of our health outcomes (Y).



We acknowledge that our study is limited in two key respects. The first limitation is our cross-sectional design, which precludes any causal inferences. For example, we fully acknowledge that, contrary to our model, psychological distress could precede perceptions of neighborhood disorder through processes related to negative cognitive bias (a symptom depression), and poor health could elicit religious struggles through negative coping processes. Given that many of our focal associations are likely to be bidirectional or mutually reinforcing, we cannot exclude, theoretically or empirically, viable alternatives to our proposed mediation model. In other words, our model is only one of many potential models. We do note that our model is well supported by previous theory and longitudinal research.

Our second limitation is measurement. Although CHAPS is unique in its assessment of valid and reliable indicators of neighborhood disorder, religious struggles, and health, our omnibus survey was limited with respect to more elaborate measurements. We direct future research to employ more detailed assessments of neighborhood disorder and religious struggles (Exline et al., 2021b, 2022a, 2022b; Ross & Mirowsky, 1999). For example, additional dimensions of religious struggles could be considered (e.g., different approaches to God, moral struggles, demonic struggles, and disengaging). Biomarkers and direct mortality data would also provide more direct and objective assessments of physical health and life expectancy.

## Conclusion

Despite these limitations, we believe that our analyses offer new insights into the study of population health by integrating the study of neighborhood context and religion. We are confident that the association between neighborhood disorder and poorer health is at least partially mediated by religious struggles. Of course, this conclusion is contingent upon replication with longitudinal data and more comprehensive assessments of neighborhood disorder and religious struggles. Our work may also be extended through the exploration of additional dimensions of religious struggles and novel health-related outcomes (e.g., allostatic load and mortality risk). We acknowledge that our proposed mediation model might also vary according to theoretically relevant subgroups like gender and age (i.e., moderated mediation). Research along these lines would help to advance our understanding of the intersection of religious struggles and the subjective experience of neighborhood disorder.

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## Declarations

**Conflict of interest** All authors declare no conflict of interest.

**Ethical Approval** Because this article employs secondary data that were previously collected de-identified data to protect respondents, it was exempt from human subjects review. When the study was collected, informed consent was obtained from all individual participants. No animals were included in the study.

## References

- Ai, A., Pargament, K., Kronfol, Z., Tice, T., & Appel, H. (2010). Pathways to postoperative hostility in cardiac patients: Mediation of coping, spiritual struggle and interleukin-6. *Journal of Health Psychology, 15*, 186–195. <https://doi.org/10.1177/1359105309345556>
- Allison, P. (2012). *Do we really need zero-inflated models?* Statistical Horizons, Ardmore, PA. <https://statisticalhorizons.com/zero-inflated-models>
- AmeriSpeak. (2022). *Technical overview of the AmeriSpeak® panel NORC's probability-based household panel.* University of Chicago. <https://amerispeak.norc.org/Documents/Research/AmeriSpeak%20Technical%20Overview%202019%2002%2018.pdf>
- Assari, S. (2017). Perceived neighborhood safety better predicts risk of mortality for whites than blacks. *Journal of Racial and Ethnic Health Disparities, 4*, 937–948. <https://doi.org/10.1007/s40615-016-0297-x>
- Bockrath, M., Pargament, K., Wong, S., Harriott, V., Pomerleau, J., Homolka, S., Chaudhary, Z., & Exline, J. (2022). Religious and spiritual struggles and their links to psychological adjustment: A meta-analysis of longitudinal studies. *Psychology of Religion and Spirituality. https://doi.org/10.1037/rel0000400*
- Carbone, J. (2020). The mediating effect of allostatic load on the relationship between neighborhood perceptions and depression. *SSM-Population Health, 11*, 100638. <https://doi.org/10.1016/j.ssmph.2020.100638>
- Chen-Edinboro, L., Kaufmann, C., Augustinavicius, J., Mojtabai, R., Parisi, J., Wennberg, A., Smith, M., & Spira, A. (2015). Neighborhood physical disorder, social cohesion, and insomnia: Results from participants over age 50 in the Health and Retirement Study. *International Psychogeriatrics, 27*, 289–296. <https://doi.org/10.1017/S1041610214001823>
- Christie-Mizell, C., Steelman, L., & Stewart, J. (2003). Seeing their surroundings: The effects of neighborhood setting and race on maternal distress. *Social Science Research, 32*, 402–428. [https://doi.org/10.1016/S0049-089X\(03\)00014-0](https://doi.org/10.1016/S0049-089X(03)00014-0)
- Coimbra, B., Carvalho, C., van Zuiden, M., Williamson, R., Ota, V., Mello, A., Belangero, S., Olf, M., & Mello, M. (2022). The impact of neighborhood context on telomere length: A systematic review. *Health & Place, 74*, 102746. <https://doi.org/10.1016/j.healthplace.2022.102746>
- Cowden, R., Pargament, K., Chen, Z., Davis, E., Lemke, A., Glowiak, K., Rueger, S., & Worthington, E. (2022). Religious/spiritual struggles and psychological distress: A test of three models in a longitudinal study of adults with chronic health conditions. *Journal of Clinical Psychology, 78*, 544–558. <https://doi.org/10.1002/jclp.23232>
- Cui, W. (2002). Reducing error in mail surveys. *Practical Assessment, Research, and Evaluation, 8*, 18. <https://doi.org/10.7275/rr94-yr91>
- Current Population Survey. (2022). *Current Population Survey data.* U.S. Census Bureau, Washington, DC. <https://www.census.gov/programs-surveys/cps/data.html>
- DeSantis, A., Troxel, W., Beckman, R., Ghosh-Dastidar, B., Hunter, G., Hale, L., Buysse, D., & Dubowitz, T. (2016). Is the association between neighborhood characteristics and sleep quality mediated by psychological distress? An analysis of perceived and objective measures of 2 Pittsburgh neighborhoods. *Sleep Health, 2*, 277–282. <https://doi.org/10.1016/j.sleh.2016.08.001>
- Ellison, C., Bradshaw, M., Storch, J., Marcum, J., & Hill, T. (2011). Religious doubts and sleep quality: Findings from a nationwide study of Presbyterians. *Review of Religious Research, 53*, 119–136. <https://doi.org/10.1007/s13644-011-0019-0>
- Ellison, C., & Lee, J. (2010). Spiritual struggles and psychological distress: Is there a dark side of religion? *Social Indicators Research, 98*, 501–517. <https://doi.org/10.1007/s11205-009-9553-3>
- Exline, J. (2002). Stumbling blocks on the religious road: Fractured relationships, nagging vices, and the inner struggle to believe. *Psychological Inquiry, 13*, 182–189. [https://doi.org/10.1207/S15327965PLI1303\\_03](https://doi.org/10.1207/S15327965PLI1303_03)
- Exline, J., Pargament, K., Grubbs, J., & Yali, A. (2014b). The Religious and Spiritual Struggles Scale: Development and initial validation. *Psychology of Religion and Spirituality, 6*, 208–222. <https://doi.org/10.1037/a0036465>
- Exline, J., Pargament, K., Wilt, J., Grubbs, J., & Yali, A. (2022a). The RSS-14: Development and preliminary validation of a 14-item form of the Religious and Spiritual Struggles Scale. *Psychology of Religion and Spirituality. https://doi.org/10.1037/rel0000472*

- Exline, J., Park, C., Smyth, J., & Carey, M. (2011a). Anger toward God: social-cognitive predictors, prevalence, and links with adjustment to bereavement and cancer. *Journal of Personality and Social Psychology, 100*, 129–148. <https://doi.org/10.1037/a0021716>
- Exline, J., Stauner, N., Wilt, J., & Grubbs, J. (2021a). Religious and spiritual struggles around the 2016 and 2020 US presidential elections. *Psychology of Religion and Spirituality. https://doi.org/10.1037/reI0000449*
- Exline, J., Van Tongeren, D., Bradley, D., Wilt, J., Stauner, N., Pargament, K., & DeWall, C. (2022b). Pulling away from religion: Religious/spiritual struggles and religious disengagement among college students. *Psychology of Religion and Spirituality. https://doi.org/10.1037/reI0000375*
- Exline, J., Wilt, J., Stauner, N., & Pargament, K. (2021b). Approach, disengagement, protest, and suppression: Four behaviors toward God in the context of religious/spiritual struggle. *Psychology of Religion and Spirituality. https://doi.org/10.1037/reI0000445*
- Faigin, C., Pargament, K., & Abu-Raiya, H. (2014). Spiritual struggles as a possible risk factor for addictive behaviors: An initial empirical investigation. *The International Journal for the Psychology of Religion, 24*, 201–214. <https://doi.org/10.1080/10508619.2013.837661>
- Feldman, P., & Steptoe, A. (2004). How neighborhoods and physical functioning are related: The roles of neighborhood socioeconomic status, perceived neighborhood strain, and individual health risk factors. *Annals of Behavioral Medicine, 27*, 91–99. [https://doi.org/10.1207/s15324796abm2702\\_3](https://doi.org/10.1207/s15324796abm2702_3)
- Fitchett, G., Murphy, P., Kim, J., Gibbons, J., Cameron, J., & Davis, J. (2004). Religious struggle: Prevalence, correlates and mental health risks in diabetic, congestive heart failure, and oncology patients. *The International Journal of Psychiatry in Medicine, 34*, 179–196. <https://doi.org/10.2190/UCJ9-DP4M-9C0X-835M>
- Gall, T., Kristjansson, E., Charbonneau, C., & Florack, P. (2009). A longitudinal study on the role of spirituality in response to the diagnosis and treatment of breast cancer. *Journal of Behavioral Medicine, 32*, 174–186. <https://doi.org/10.1007/s10865-008-9182-3>
- Gardner, W., Mulvey, E., & Shaw, E. (1995). Regression analyses of counts and rates: Poisson, overdispersed Poisson, and negative binomial models. *Psychological Bulletin, 118*, 392–404. <https://doi.org/10.1037/0033-2909.118.3.392>
- Griffin, B., Loh, V., & Hesketh, B. (2013). A mental model of factors associated with subjective life expectancy. *Social Science & Medicine, 82*, 79–86. <https://doi.org/10.1016/j.socscimed.2013.01.026>
- Haney, T. (2007). “Broken windows” and self-esteem: Subjective understandings of neighborhood poverty and disorder. *Social Science Research, 36*, 968–994. <https://doi.org/10.1016/j.ssresearch.2006.07.003>
- Hayes, A. (2013). *Introduction to mediation, moderation, and conditional processes analysis: A regression-based approach*. Guilford Press.
- Hill, T. (2021). *Crime, health, and politics survey*. University of Texas at San Antonio.
- Hill, T., & Angel, R. (2005). Neighborhood disorder, psychological distress, and heavy drinking. *Social Science & Medicine, 61*, 965–975. <https://doi.org/10.1016/j.socscimed.2004.12.027>
- Hill, T., Burdette, A., & Hale, L. (2009). Neighborhood disorder, sleep quality, and psychological distress: Testing a model of structural amplification. *Health & Place, 15*, 1006–1013. <https://doi.org/10.1016/j.healthplace.2009.04.001>
- Hill, T., Burdette, A., Jokinen-Gordon, H., & Brailsford, J. (2013). Neighborhood disorder, social support, and self-esteem: Evidence from a sample of low-income women living in three cities. *City & Community, 12*, 380–395. <https://doi.org/10.1111/cico.12044>
- Hill, T., Christie-Mizell, C., Vaghela, P., Mossakowski, K., & Johnson, R. (2017). Do religious struggles mediate the association between day-to-day discrimination and depressive symptoms? *Religions, 8*, 134. <https://doi.org/10.3390/rel8080134>
- Hill, T., Ellison, C., & Hale, L. (2020). Religious attendance, depressive symptoms, and sleep disturbance in older Mexican Americans. *Mental Health, Religion & Culture, 23*, 24–37. <https://doi.org/10.1080/13674676.2019.1710829>
- Hill, T., & Maimon, D. (2013). Neighborhood context and mental health. In C. Aneshensel, J. Phelan, & A. Bierman (Eds.), *Handbook of the Sociology of Mental Health* (pp. 479–501). Dordrecht: Springer. [https://doi.org/10.1007/978-94-007-4276-5\\_23](https://doi.org/10.1007/978-94-007-4276-5_23)
- Hill, T., Trinh, H., Wen, M., & Hale, L. (2016). Perceived neighborhood safety and sleep quality: a global analysis of six countries. *Sleep Medicine, 18*, 56–60. <https://doi.org/10.1016/j.sleep.2014.12.003>
- Hill, T., Zeng, L., Rambotti, S., Mossakowski, K., & Johnson, R. (2021). Sad eyes, crooked crosses: Religious struggles, Psychological distress and the mediating role of psychosocial resources. *Journal of Religion and Health, 60*, 2573–2591. <https://doi.org/10.1007/s10943-021-01273-y>

- Hunter, J., & Hayden, K. (2018). The association of sleep with neighborhood physical and social environment. *Public Health*, 162, 126–134. <https://doi.org/10.1016/j.puhe.2018.05.003>
- Idler, E., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior*, 38, 21–37. <https://doi.org/10.2307/2955359>
- Ironson, G., Stuetzle, R., Ironson, D., Balbin, E., Kremer, H., George, A., Schneiderman, N., & Fletcher, M. (2011). View of God as benevolent and forgiving or punishing and judgmental predicts HIV disease progression. *Journal of Behavioral Medicine*, 34, 414–425. <https://doi.org/10.1007/s10865-011-9314-z>
- Jang, S., & Johnson, B. (2001). Neighborhood disorder, individual religiosity, and adolescent use of illicit drugs: A test of multilevel hypotheses. *Criminology*, 39, 109–144. <https://doi.org/10.1111/j.1745-9125.2001.tb00918.x>
- Johnson, D., Lisabeth, L., Hickson, D., Johnson-Lawrence, V., Samdarshi, T., Taylor, H., & Diez Roux, A. (2016). The social patterning of sleep in African Americans: Associations of socioeconomic position and neighborhood characteristics with sleep in the Jackson Heart Study. *Sleep*, 39, 1749–1759. <https://doi.org/10.5665/sleep.6106>
- Kessler, R., Andrews, G., Colpe, L., Hiripi, E., Mroczek, D., Normand, S., Walters, E., & Zaslavsky, A. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*, 32, 959–976. <https://doi.org/10.1017/S0033291702006074>
- Kim, J., & Kim, J. (2017). Subjective life expectancy is a risk factor for perceived health status and mortality. *Health and Quality of Life Outcomes*, 15, 190. <https://doi.org/10.1186/s12955-017-0763-0>
- Kish, L. (1965). *Survey sampling*. John Wiley & Sons.
- Koenig, H., King, D., & Carson, V. (2012). *Handbook of Religion and Health*. Oxford University Press.
- Koenig, H., Pargament, K., & Nielsen, J. (1998). Religious coping and health status in medically ill hospitalized older adults. *The Journal of Nervous and Mental Disease*, 186, 513–521. <https://doi.org/10.1097/00005053-199809000-00001>
- Krause, N. (1998). Neighborhood deterioration, religious coping, and changes in health during late life. *The Gerontologist*, 38, 653–664. <https://doi.org/10.1093/geront/38.6.653>
- Krause, N., & Ellison, C. (2009). The doubting process: A longitudinal study of the precipitants and consequences of religious doubt in older adults. *Journal for the Scientific Study of Religion*, 48, 293–312. <https://doi.org/10.1111/j.1468-5906.2009.01448.x>
- Krause, N., & Hayward, R. (2012). Humility, lifetime trauma, and change in religious doubt among older adults. *Journal of Religion and Health*, 51, 1002–1016. <https://doi.org/10.1007/s10943-012-9576-y>
- Krause, N., Ironson, G., Pargament, K., & Hill, P. (2017a). Neighborhood conditions, religious coping, and uncontrolled hypertension. *Social Science Research*, 62, 161–174. <https://doi.org/10.1016/j.ssresearch.2016.08.004>
- Krause, N., Pargament, K., & Ironson, G. (2017b). Spiritual struggles and health: Assessing the influence of socioeconomic status. *Journal for the Scientific Study of Religion*, 56, 620–636. <https://doi.org/10.1111/jssr.12364>
- Krause, N., & Wulff, K. (2004). Religious doubt and health: Exploring the potential dark side of religion. *Sociology of Religion*, 65, 35–56. <https://doi.org/10.2307/3712506>
- MacKinnon, D. (2008). *Introduction to statistical mediation analysis*. Lawrence Erlbaum.
- Magyar-Russell, G., & Pargament, K. (2006). The darker side of religion: Risk factors for poorer health and well-being. In P. McNamera (Ed.), *Where God and man meet: How the brain and evolutionary studies alter our understanding of religion* (pp. 91–117). Praeger Publishers.
- Miles, R. (2006). Neighborhood disorder and smoking: Findings of a European urban survey. *Social Science & Medicine*, 63, 2464–2475. <https://doi.org/10.1016/j.socscimed.2006.06.011>
- Mirowsky, J., & Ross, C. (2000). Socioeconomic status and subjective life expectancy. *Social Psychology Quarterly*. <https://doi.org/10.2307/2695888>
- O'Brien, D., Farrell, C., & Welsh, B. (2019). Broken (windows) theory: A meta-analysis of the evidence for the pathways from neighborhood disorder to resident health outcomes and behaviors. *Social Science & Medicine*, 228, 272–292. <https://doi.org/10.1016/j.socscimed.2018.11.015>
- Pargament, K., Koenig, H., Tarakeshwar, N., & Hahn, J. (2001). Religious struggle as a predictor of mortality among medically ill elderly patients: A 2-year longitudinal study. *Archives of Internal Medicine*, 161, 1881–1885. <https://doi.org/10.1001/archinte.161.15.1881>
- Pargament, K., Koenig, H., Tarakeshwar, N., & Hahn, J. (2004). Religious coping methods as predictors of psychological, physical and spiritual outcomes among medically ill elderly patients: A two-year longitudinal study. *Journal of Health Psychology*, 9, 713–730. <https://doi.org/10.1177/1359105304045366>

- Pargament, K., Smith, B., Koenig, H., & Perez, L. (1998). Patterns of positive and negative religious coping with major life stressors. *Journal for the Scientific Study of Religion*, *37*, 710–724. <https://doi.org/10.2307/1388152>
- Park, C., Wortmann, J., & Edmondson, D. (2011). Religious struggle as a predictor of subsequent mental and physical well-being in advanced heart failure patients. *Journal of Behavioral Medicine*, *34*, 426–436. <https://doi.org/10.1007/s10865-011-9315-y>
- Petersen, A., & Kellam, S. (1977). Measurement of the psychological well-being of adolescents: The psychometric properties and assessment procedures of the How I Feel. *Journal of Youth and Adolescence*, *6*, 229–247. <https://doi.org/10.1007/BF02138937>
- Pew Research Center. (2021). *Methodology: The American Trends Panel survey methodology*. Washington, DC. <https://www.Pewresearch.org/politics/2021/05/17/scope-of-government-methodology/>
- Ross, C. (2000). Neighborhood disadvantage and adult depression. *Journal of Health and Social Behavior*, *41*, 177–187. <https://doi.org/10.2307/2676304>
- Ross, C., & Mirowsky, J. (1999). Disorder and decay: The concept and measurement of perceived neighborhood disorder. *Urban Affairs Review*, *34*, 412–432. <https://doi.org/10.1177/107808749903400304>
- Ross, C., & Mirowsky, J. (2001). Neighborhood disadvantage, disorder, and health. *Journal of Health and Social Behavior*, *42*, 258–276. <https://doi.org/10.2307/3090214>
- Ross, C., & Mirowsky, J. (2009). Neighborhood disorder, subjective alienation, and distress. *Journal of Health and Social Behavior*, *50*, 49–64. <https://doi.org/10.1177/002214650905000104>
- Schieman, S., & Meersman, S. (2004). Neighborhood problems and health among older adults: Received and donated social support and the sense of mastery as effect modifiers. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *59*, S89–S97. <https://doi.org/10.1093/geronb/59.2.S89>
- Schieman, S., Pearlin, L., & Meersman, S. (2006). Neighborhood disadvantage and anger among older adults: Social comparisons as effect modifiers. *Journal of Health and Social Behavior*, *47*, 156–172. <https://doi.org/10.1177/002214650604700205>
- Schulz, A., Mentz, G., Lachance, L., Zenk, S., Johnson, J., Stokes, C., & Mandell, R. (2013). Do observed or perceived characteristics of the neighborhood environment mediate associations between neighborhood poverty and cumulative biological risk? *Health & Place*, *24*, 147–156. <https://doi.org/10.1016/j.healthplace.2013.09.005>
- Silton, N., Flannelly, K., Galek, K., & Ellison, C. (2014). Beliefs about God and mental health among American adults. *Journal of Religion and Health*, *53*, 1285–1296. <https://doi.org/10.1007/s10943-013-9712-3>
- Stauner, N., Exline, J., Grubbs, J., Pargament, K., Bradley, D., & Uzdavines, A. (2016). Bifactor models of religious and spiritual struggles: Distinct from religiousness and distress. *Religions*, *7*, 130. <https://doi.org/10.3390/rel7060068>
- Stauner, N., Exline, J., Pargament, K., Wilt, J., & Grubbs, J. (2019). Stressful life events and religiousness predict struggles about religion and spirituality. *Psychology of Religion and Spirituality*, *11*, 291–296. <https://doi.org/10.1037/rel0000189>
- Steensland, B., Robinson, L., Wilcox, W., Park, J., Regnerus, M., & Woodberry, R. (2000). The measure of American religion: Toward improving the state of the art. *Social Forces*, *79*, 291–318. <https://doi.org/10.1093/sf/79.1.291>
- Upenieks, L. (2021). Changes in religious doubt and physical and mental health in emerging adulthood. *Journal for the Scientific Study of Religion*, *60*, 332–361. <https://doi.org/10.1111/jssr.12712>
- Upenieks, L. (2022). Religious/spiritual struggles and suicidal ideation in the COVID-19 era: Does the belief in divine control and religious attendance matter? *Psychology of Religion and Spirituality*. <https://doi.org/10.1037/rel0000467>
- van Deurzen, I., Rod, N., Christensen, U., Hansen, Å., Lund, R., & Dich, N. (2016). Neighborhood perceptions and allostatic load: Evidence from Denmark. *Health & Place*, *40*, 1–8. <https://doi.org/10.1016/j.healthplace.2016.04.010>
- van Solinge, H., & Henkens, K. (2018). Subjective life expectancy and actual mortality: Results of a 10-year panel study among older workers. *European Journal of Ageing*, *15*, 155–164. <https://doi.org/10.1007/s10433-017-0442-3>
- VanderWeele, T. (2015). *Explanations in causal inference: Methods for mediation and interaction*. Oxford University Press.
- Wen, M., Hawkey, L., & Cacioppo, J. (2006). Objective and perceived neighborhood environment, individual SES and psychosocial factors, and self-rated health: An analysis of older adults in Cook

- County, Illinois. *Social Science & Medicine*, 63, 2575–2590. <https://doi.org/10.1016/j.socscimed.2006.06.025>
- Wilt, J., Exline, J., & Pargament, K. (2022). Daily measures of religious/spiritual struggles: Relations to depression, anxiety, satisfaction with life, and meaning. *Psychology of Religion and Spirituality*. <https://doi.org/10.1037/rel0000399>
- Wortmann, J., Park, C., & Edmondson, D. (2011). Trauma and PTSD symptoms: Does spiritual struggle mediate the link? *Psychological Trauma: Theory, Research, Practice, and Policy*, 3, 442–452. <https://doi.org/10.1037/a0021413>

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