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Race, Death of a Child, and Mortality Risk among Aging Parents in the United States

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Abstract

The death of a child is a stressful and traumatic life event that has been linked to increased mortality risk among parents. Tragically, black parents are significantly more likely than white parents to lose a child in the United States; however, prior research has not addressed this racial disadvantage in relation to parents' mortality. In this study, we focus on the racial context of the United States to suggest that black parents already face higher mortality rates compared to white parents, and the unequal burden of child death adds to their mortality risk. Using discrete-time event history models, we consider whether the death of a child by midlife is associated with increased mortality risk for black parents and for white parents in mid-to later-life using longitudinal data from the Health and Retirement Study (HRS; 1996–2016). Descriptive results show that by midlife, black parents, especially black mothers, experience substantially higher child mortality compared with white parents. At the same time, we find that losing a child prior to midlife is associated with heightened mortality risk for aging black mothers and white mothers. Controlling for educational attainment explains the association between child death and parental mortality risk among white mothers, whereas heightened biopsychosocial and behavioral risk factors explain the association for black mothers. Overall, the death of a child is associated with increased mortality risk for black mothers and for white mothers, but the *processes* linking child death to parental mortality seem to differ for black and white parents. These findings have implications for policies and interventions that address increased mortality risk for parents following the death of a child.

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Credit Author Statement

R. Donnelly wrote the article with input from all authors and conducted statistical analyses. D. Umberson assisted with writing and revising the article. R.A. Hummer assisted with revising the article and developing the methodological approach. M.A. Garcia assisted with revising the article.

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Keywords

Race; Minority Aging; Mortality; Bereavement; Death of a Child

The death of a child is a devastating life event for parents. Parents expect their children to outlive them and, from this perspective, the loss of a child at any age is unexpected, premature, and a turning point in a parent's life. Prior studies show the death of a child is associated with increased mortality risk for parents (see Hendrickson, 2009 for a review), perhaps due to cascading biological, psychological, social, and behavioral risk factors triggered by the loss. However, past studies primarily draw on white populations in Europe (e.g., Li et al., 2003; Rostila et al., 2012; Rostila et al., 2015; Werthmann et al., 2010) and the United States (e.g., Espinosa & Evans, 2013; Song et al., 2019). This approach neglects to consider systematic and structural racism in the United States and the consequences of child death for black Americans. A legacy of racial inequalities means that black Americans die at much higher rates than white Americans (Rogers, Hummer, Krueger, & Vinneau, 2019; Kochanek, Murphy, Xu, & Arias, 2019), and as a result, black parents are substantially more likely than white parents to experience the death of a child during their lifetime (Umberson, Olson, Liu, Pudrovska, & Donnelly, 2017). However, prior work has not considered race differences in exposure to the death of a child and the processes linking child death to parental mortality risk.

In this study, we analyze longitudinal data from the Health and Retirement Study (HRS) to consider how the death of a child occurring by the time the parent reaches midlife is associated with parents' mortality risk from mid- to later-life and in potentially different ways for black mothers and fathers compared to white mothers and fathers. Midlife is generally considered to be the period from age 40 to age 60 or 65, when later-life begins (Lachman, 2004). We work from a life course perspective to hypothesize that the death of a child has significant and lasting effects on parents' mortality risk, largely due to accumulating risk associated with biopsychosocial factors that are triggered by the loss. We further hypothesize that there are racialized and gendered patterns of disadvantage in this linkage. Not only are black parents more likely than white parents to lose a child (Umberson et al., 2017), black Americans, on average, live shorter lives than white Americans (Rogers et al., 2019; Kochanek et al., 2019) and are characterized by very different socioeconomic, behavioral, and biopsychosocial characteristics compared to white Americans (Boen, 2016). Moreover, men and women tend to differ in their exposure to life course stressors, how they respond to stress, and their mental and physical health (Thoits, 2010). Because race and gender intersect in ways that shape experiences of power and oppression (Collins, 2009), we examine the association between the death of a child and parental mortality risk separately for black and white mothers and fathers.

By conceptualizing and examining the processes linking child death with parental mortality separately by race and gender, we provide new insights into how experiencing the death of a child contributes to mortality patterns for black parents and for white parents in the United States. We focus on the death of a child as a key life course event that may contribute to mortality. The present study thus builds on prior research by: 1) considering how patterns of

child death are related to parental mortality for black parents and for white parents, 2) examining whether the death of a child contributes to biopsychosocial and behavioral risk factors that increase mortality risk, with attention to how these associations unfold for black parents and for white parents, and 3) testing whether these risk factors attenuate the association between child death and parental mortality risk for black parents and for white parents.

BACKGROUND

The Extent of Child Death

The death of a child is a common event in the United States. Available data focus primarily on the death of minor children and suggest that approximately 100,000 parents lose a minor child each year (Kochanek et al., 2019) – a significantly greater burden of child mortality than in other nations in the Organization for Economic Cooperation and Development (OECD; Thakrar et al., 2018). These estimates overlook the substantial number of parents who lose older children during their lifetime, suggesting that the number of bereaved parents in the United States is much larger. Moreover, recent research documents striking race differences in exposure to the death of a child in the United States. Black parents are more likely to lose a child and to lose a child at younger ages; by one estimate 12% of black parents have lost a child by age 50 compared to 6% of white parents (Umberson et al., 2017). Indeed, white parents are much less likely than black parents to ever experience the death of a child. This racial disadvantage in exposure to the death of a child is the result of a legacy of racism that shortens life expectancy for black Americans (e.g., Sternthal, Slopen, & Williams, 2011; Williams, Lawrence, & Davis, 2019). In particular, Black Americans have higher rates of mortality than white Americans up through age 90 and this black-white mortality gap is largest prior to midlife (Rogers et al., 2019; Kochanek et al., 2019). The present study shifts the focus to bereaved parents and consequences for their own mortality, specific to U.S. black and white parents.

The Death of a Child and Parents' Mortality Risk

Losing a child is a uniquely traumatic event in parents' lives. Parents expect to outlive their children and parents typically feel a sense of responsibility to protect their children (Rogers et al., 2008). As such, when a child dies, the consequences may be especially powerful. Studies focusing on health consequences following the death of a child document several adverse health consequences and increased mortality risk for parents (see Hendrickson, 2009 for a review). Prior studies tend to focus on parents who lose minor children (e.g., Li et al., 2003; Rostila et al., 2015; Werthmann et al., 2010), but recent research considering the death of non-minor children finds similar bereavement effects on parental mortality for parents losing minor or non-minor child (e.g., Espinosa & Evans, 2013; Rostila et al., 2012; Schorr et al., 2016). These findings suggest that the loss of a child of any age is a uniquely stressful event for parents, with significant consequences for longevity of parents.

The lack of attention to race in the loss of a child is a significant gap in the literature. Prior studies primarily rely on administrative data from European countries such as Denmark and Sweden that do not have a similar legacy of slavery and racial segregation as in the United

States (e.g., Li et al., 2003; Rostila et al., 2012; Rostila et al., 2015; Werthmann et al., 2010). Moreover, to our knowledge, only two studies examine child death and parental mortality risk in the United States, and these studies either draw on survey data with too few numbers of non-white participants to conduct race-specific analyses (e.g., Song et al., 2019) or do not consider race differences in exposure to the death of a child (e.g., Espinosa & Evans, 2013). This is a serious omission because black parents are much more likely than white parents to lose a child during their lifetime – and to experience this loss earlier in life (Umberson et al., 2017). Bereavement, then, is an all-too-common source of disadvantage for black Americans that may be an especially important source of stress that adds to the greater stress burden that black Americans experience throughout the life course (e.g., Sternthal, Slopen, & Williams, 2011; Williams, Lawrence, & Davis, 2019). Therefore, we test the following hypothesis:

Hypothesis 1: Parents who lose a child by midlife will have higher risk of mortality during mid- to later-life compared to parents who do not lose a child by midlife; this association will be significant for black parents and for white parents.

Experiencing the death of a child by midlife likely heightens parental mortality risk in mid- to later-life through the activation of a constellation of biological, psychological, social, and behavioral risk factors that accumulate over time. Indeed, stress proliferates over the life course, wherein one stressor (e.g., the death of a child) gives rise to a host of additional stressors that may undermine health (Pearlin & Skaff, 1996; Pearlin et al., 2005). The process of stress proliferation typically unfolds over a long period of time, as biopsychosocial and behavioral responses act as chains of risk over the life course. Thus, when a parent loses a child by midlife, the stress proliferation process launches a trajectory of declining health for parents.

Past studies suggest several biopsychosocial and behavioral responses to losing a child that might increase parental mortality risk over the life course. Psychological responses to the death of a child are particularly well-documented, with bereaved parents more likely to experience post-traumatic stress disorder (PTSD), depression, and hospitalization for mental illness (Bolton et al., 2013; Murphy et al., 2003; Li et al., 2005; Rogers et al., 2008; Youngblut et al., 2013). Similarly, the death of a child may activate social processes that undermine health. For example, parents tend to cope with their grief in ways that strain their relationship with each other (Stroebe et al., 2013) and losing a child increases risk of marital dissolution among married parents (see Albuquerque, Pereira, & Narciso, 2016 for a review); however, some research suggests that the effects of child death on divorce are quite modest (Finnäs et al., 2018). Responses to bereavement can also include unhealthy behaviors such as increased alcohol consumption or poor diet – common reactions to emotional distress (e.g., Stroebe et al., 2007). The stress from losing a child may also trigger biological responses that erode health. For example, coping with stress activates the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system (SNS) and this biological dysregulation has detrimental effects on health over the life course (e.g., Danese & McEwan, 2012; Geronimus et al., 2006; Seeman et al., 2001). Many of these biopsychosocial and behavioral responses occur soon after the death of a child (e.g., within the first year or two) and persist for years (e.g., Albuquerque et al., 2016; Li et al., 2005;

Murphy et al., 2003; Rogers et al., 2008). Indeed, the persistence of these biopsychosocial and behavioral risk factors likely contributes to the long-term consequences of child death for parental mortality risk, such as a heightened mortality risk 10–20 years after the death of a child (Cohen-Mansfield et al., 2013; Li et al., 2003; Rostila et al., 2012; Song et al., 2019; Werthmann et al., 2010). Overall, existing evidence suggests that the death of child may trigger intersecting biopsychosocial and behavioral pathways that in turn contribute to poor health and increased mortality risk for bereaved parents.

An important consideration is that biopsychosocial and behavioral risk factors associated with the death of a child may differ for black compared to white parents. Scholars increasingly recognize that the pathways to health unfold in different ways for black and white Americans. In particular, black and white adults tend to differ in how they respond to stress. Black older adults, for example, are more likely than white adults to use religion and spirituality as a means of coping with stress (Taylor, Chatters, & Jackson, 2007). Moreover, several studies find evidence that engaging in poor health behaviors (e.g., smoking, alcohol use, poor diet) in response to stress reduces the mental health consequences of stress for black adults, but not white adults (Jackson, Knight, & Rafferty, 2010; Mezuk et al., 2010). Although these unhealthy coping behaviors may alleviate some stress, they may contribute to long-term disadvantage in physical health and mortality for black adults (Mezuk et al. 2013). Studies also point to the importance of considering how gender and race intersect to shape stress responses. For example, black women are more likely than black men to consume comfort foods in response to stress, but this likely contributes to the high rates of obesity among black women (Jackson, 2002). Thus, in the context of experiencing the death of a child, subsequent risk factors may differ for black and white mothers and fathers. Unique differences between black and white parents in exposure to child death and cascading risk factors in response to child death necessitate a separate examination of black compared to white mothers and fathers.

Taken together, prior research and theory suggest that losing a child likely contributes to parents' mortality risk because of cascading biological, psychological, social, and behavioral risk factors known to be associated with mortality. As such, accounting for these biopsychosocial and behavioral risk factors should explain the association between child death and parental mortality risk. However, this hypothesis has not been tested in prior research. Moreover, because many biopsychosocial and behavioral factors such as health behaviors, depression, and social relationships differ for black and white Americans (e.g., Whitfield & Baker, 2014; Williams et al., 2019; Williams & Mohammed, 2013), the processes linking the death of a child to parental mortality risk likely differ for black and white parents. Therefore, we test the following hypotheses:

Hypothesis 2: The death of a child by midlife will be associated with increased risk for biological, psychological, social, and behavioral factors known to be associated with mortality, and the most salient factors will differ for black and white parents.

Hypothesis 3: Biopsychosocial and behavioral risk factors will explain the association between the death of a child and parental mortality risk for black and white parents.

METHOD

Data

Data come from the Health and Retirement Study (HRS), a nationally representative sample of the United States population over age 50. The HRS is an ongoing, biannual survey that began in 1992 with a sample of adults aged 50–60 years old and adds a new cohort of adults aged 50–55 years old every six years. Cohorts in the present study include the original HRS cohort (born 1931–1941; entered in 1992), the War Babies cohort (born 1942–1947; entered in 1998), the Early Baby Boomers (born 1948–1953; entered in 2004), and the Mid Baby Boomers (born 1954–1959; entered in 2010). The Late Baby Boomer cohort (born 1960–1965) was added in 2016, but we do not include this cohort in the analytic sample because they do not yet have a mortality follow-up period. The HRS also surveys the spouses of focal respondents, some of whom are younger than 50 or older than 55 when they enter the study.

The analytic sample for this study includes respondents who identify as non-Hispanic white or non-Hispanic black and who report ever having any living biological children. To ensure that we capture child death occurring before midlife, we exclude respondents over age 60 at their baseline interview. We also exclude respondents younger than age 40 at the baseline interview (average age is 54 at baseline interview in our analytic sample). The survey design of the HRS is complex; as such, the baseline wave differs for respondents. We consider the baseline interview to be the year that respondents first reported data on the death of a child, which, for most respondents, is the year that they entered the study. However, questions on child death were not included in the HRS until 1996, so the first HRS survey we use is 1996 (instead of 1992). The final analytic sample includes 2,084 non-Hispanic black mother, 1,270 non-Hispanic black fathers, 5,322 non-Hispanic white mothers, and 4,112 non-Hispanic white fathers ($n = 12,788$).

Measures

Mortality.—The outcome of interest is all-cause mortality in mid- to later-life. Because the questions used to document the death of a child did not begin until 1996, we observe mortality from 1996 to 2016 for individuals who answered these questions in 1996. For those who answered questions about the death of a child in a later HRS survey (e.g., 1998, 2004, 2010), the mortality follow-up period was shorter. Measurement of mortality comes from the National Death Index and proxy reports from living family members. The mortality data in the HRS have been validated by comparisons to life tables and are considered effectively complete (Weir, 2016).

Death of a child by midlife.—At their baseline interview, each respondent provided information about the number of living, biological children they ever had and the number of biological children who were still alive. If respondents reported fewer living children than the number of children ever born, they were coded as experiencing the death of a child by midlife. While some parents in the analytic sample may have experienced a child death during midlife (average age 54 at baseline interview), none of the parents experienced a child death after midlife.

Race.—Race is central to this study given substantial disadvantage for black Americans with respect to both experiencing the death of a child and their own mortality risk. Parents self-report their race and ethnicity. The HRS first asks respondents whether they consider themselves to be Hispanic or Latino (Yes, No) and then asks what race they consider themselves (White, Black or African American, American Indian, Alaska Native, Asian, Native Hawaiian, Pacific Islander, or something else). We use these questions to create a measure indicating non-Hispanic black and non-Hispanic white parents.

Because exposure to the death of a child, mortality risk, and biopsychosocial predictors of mortality differ for black and white parents, we present results separately for black and white parents. Responses to stress, health outcomes, and mortality risk also differ by gender in the United States; as such, we present results separately for black mothers, black fathers, white mothers, and white fathers. Stratifying analytic models by race and gender is a common approach in studies of mortality in the United States (e.g., Masters, Hummer, & Powers, 2012).

Covariates.—In all analyses, we account for sociodemographic covariates that may be associated with both loss of a child and individual-level mortality risk. These include age (in years), whether respondents were born in the South compared to non-South (1=South), whether respondents are foreign-born (1=foreign-born), educational attainment (less than high school (reference), high school graduate, some college, college degree or more), and whether respondents have health insurance from a government plan or private insurance plan in their baseline interview (1=no health insurance). We also include a measure of total number of other family member deaths (i.e., spouse, mother, father) experienced prior to age 50 (Umberson et al., 2017) to account for other sources of family bereavement (range 0–3).

Biopsychosocial and behavioral covariates.—We consider biopsychosocial and behavioral covariates assessed at the respondent’s baseline interview. Psychological distress is considered a possible psychological factor linking child death to parents’ mortality risk. Distress is measured with the 8-item Center for Epidemiological Studies Depression (CES-D) scale. Respondents reported whether they felt depressed, felt like everything was an effort, sleep was restless, could not get going, felt lonely, enjoyed life, felt sad, or felt happy much of the time during the past week. Positive items are reverse coded, and all items are summed so that higher values indicate more distress (range 0–8) (Steffick, 2000). We include household income and marital status as social factors that are potentially influenced by child death and that may be associated with individual-level mortality risk. Household income is log transformed and adjusted for household size. Marital status is a categorical variable that assesses whether respondents are married (reference group), divorced, widowed, or never married.

Behavioral factors include smoking status (non-smoker (reference), current smoker) and drinking status (non-drinker, low to moderate drinker (reference), and heavy drinker). To create a measure of alcohol use, we use information on the average number of days per week respondents consumed alcohol and the average number of drinks they had on those days in the last three months. The categories for drinking status are based on recommendations from the National Institute of Alcohol Abuse and Alcoholism for older adults (Lin, Guerrieri, &

Moore, 2011), wherein low to moderate drinkers consume 1–7 alcoholic beverages per week and heavy drinkers consume 8 or more beverages per week. We assess body mass index (BMI) and diagnosed chronic conditions as possible biological factors associated with child loss and parent mortality risk. Body mass index is calculated using respondents' self-reported height and weight (weight in kilograms divided by height in meters squared). Chronic conditions count the number of doctor-diagnosed conditions including high blood pressure or hypertension, diabetes or high blood sugar, cancer or a malignant tumor (excluding skin cancer), chronic lung disease (excluding asthma), heart attack or other heart problems, stroke or transient ischemic attack, emotional or psychiatric problems, and arthritis or rheumatism (range 0–8).

Analytic Strategy

We use discrete-time event history modeling stratified by race and gender to examine mortality risk for white and black parents from 1996 to 2016. Because mortality is age-dependent, we use logistic regression models and include age as the time metric. We first examine whether the death of a child by midlife is associated with parents' mortality risk during the study period. We then use linear, logistic, and multinomial regression to test whether child death by midlife is associated with biological (BMI, diagnosed chronic conditions), psychological (distress), social/SES (household income, marital status), and behavioral (smoking, drinking) factors assessed at the baseline interview. Finally, we examine whether the association between child death by midlife and parental mortality risk persists after accounting for biopsychosocial and behavioral factors. In all analyses, we account for the complex survey design of the HRS. We weight the descriptive statistics in Table 1 by the respondent-level weight. The regression analyses do not include weights because the models include covariates related to sample selection (e.g., age, race, gender); this approach produces unbiased coefficients without weights (Heeringa, West, & Berglund, 2017; Winship & Radbill, 1994).

RESULTS

Descriptive Results

Descriptive results in Table 1 show that a greater percentage of black mothers have lost a child by midlife (12.8%) compared to black fathers (8.4%), white mothers (7.2%), and white fathers (4.8%). More black fathers died during the study period (20.5%) compared to white fathers (16.9%), and more black mothers died during the study period (16.5%) compared to white mothers (13.1%). Black parents are also more likely than white parents to have experienced other family losses by midlife. Compared to white parents, black parents (both mothers and fathers) are more likely to have lower levels of education and lower baseline household income, more likely to be uninsured at baseline, and less likely to be married at baseline interview. Black mothers are more likely to be non-drinkers, but have higher psychological distress, higher BMI, and more chronic conditions at baseline. Black fathers are more likely to be current smokers, have more chronic conditions, have higher psychological distress at baseline.

Child Death and Parent Mortality Risk

To test *Hypothesis 1*, we first consider whether experiencing the loss of a child by midlife is associated with heightened mortality risk for aging white and black parents (Table 2). Panel A of Table 2 presents results for black mothers. Black mothers who lose a child have greater odds of dying during the study compared to black mothers who do not lose a child (Model 1; $p < .01$). Moreover, the association between child loss and mortality risk is not fully attenuated by educational attainment or whether mothers have health insurance at baseline (Model 2; $p < .05$). For black mothers, losing a child is associated with over 35% greater odds of dying during the study period, net of sociodemographic covariates (coef: 0.31, $p < .05$). Panel B of Table 2 shows the results for the sample of black fathers; the association between child loss and mortality risk is not statistically significant for black fathers.

Panel C of Table 2 shows the results for the sample of white mothers. Model 1 shows that child death by midlife is positively associated with mortality risk for white mothers, net of age, region of birth, foreign-born status, and other family losses by midlife ($p < .10$). Indeed, white mothers who lose a child have 25% greater odds of dying during the study period compared to white mothers who do not lose a child by midlife (coef: 0.22). However, this association is attenuated when accounting for educational attainment and whether mothers had health insurance at baseline (Model 2); exploratory analyses show this attenuation is primarily due to educational attainment rather than whether mothers have health insurance. Panel D shows results for white fathers; the association between child loss and mortality risk is not statistically significant for white fathers. Therefore, results provide partial support for Hypothesis 1: losing a child by midlife is associated with parental mortality risk in mid- to later-life for white and black mothers, but educational attainment (and, to a lesser extent, access to health insurance) attenuates the association for white mothers.

Child Death and Biopsychosocial and Behavioral Factors

To test *Hypothesis 2*, we consider whether experiencing the death of a child by midlife is associated with social (i.e., household income, marital status), psychological (i.e., distress), behavioral (i.e., smoking, drinking), and biological (i.e., BMI, chronic conditions) factors at baseline interview for white and black parents (Table 3). Table 3, Panel A presents the results for seven different outcome variables for black mothers. Results show that, net of covariates, losing a child by midlife is associated with higher levels of psychological distress (Model 4, $p < .05$) and more chronic conditions (Model 7, $p < .001$) at baseline for black mothers. Panel B of Table 4 presents results for black fathers; none of the associations between child death and biopsychosocial and behavioral outcomes are statistically significant.

We present the results for white mothers in Panel C of Table 3. Results indicate that, net of covariates, losing a child by midlife is associated with greater odds of being a current smoker (Model 1, $p < .001$) or a non-drinker (Model 2, $p < .01$), as well as lower levels of household income (Model 5; $p < .05$) and more chronic conditions (Model 7; $p < .01$) at baseline for white mothers. Panel D of Table 3 shows that for white fathers, losing a child is associated with greater odds of being a non-drinker (Model 2; $p < .05$), higher levels of

psychological distress (Model 4, $p < .01$), and more chronic conditions (Model 7, $p < .05$) at baseline.

Overall, we find partial support for Hypothesis 2, with child death by midlife associated with several biopsychosocial and behavioral factors at baseline; moreover, some of the most salient associations between the death of a child and baseline risk factors differed for black mothers, white mothers, and white fathers. Losing a child by midlife was associated with biological (i.e., chronic conditions), psychological (i.e., distress), social/SES (i.e., household income), and behavioral (i.e., smoking status, alcohol use) factors for white parents, whereas losing a child by midlife was associated with psychological (i.e., distress) and biological (i.e., chronic conditions) factors for black mothers.

Child Death, Biopsychosocial Factors, and Mortality Risk

In Table 4, we consider whether the association of child death by midlife with parent mortality risk is explained by biopsychosocial and behavioral factors separately for black mothers, black fathers, white mothers, and white fathers (*Hypothesis 3*). Beginning with the base model (Model 1), we add behavioral, psychological, social, and biological factors separately in Models 2–5, respectively, before including all risk factors in Model 6. For black mothers (Table 4, Panel A), the addition of psychological (Model 3) factors reduces the association between child loss and parental mortality risk to marginal statistical significance ($p < .10$) and the addition of biological factors (Model 5) reduces the association further such that it is no longer statistically significant. When all biopsychosocial and behavioral covariates are included in Model 6 of Panel A, child death by midlife is no longer associated with parental mortality risk. However, it is notable that while the coefficient for child death is reduced by approximately 30% from Model 1 to Model 6, the coefficient remains relatively large in Model 6. Model 6 shows that black mothers who lose a child by midlife have approximately 23% greater odds of dying in mid- to later-life compared to black mothers who do not lose a child, net of sociodemographic, biopsychosocial, and behavioral covariates (Model 6, coef: 0.21).

For black fathers (Table 4, Panel B), white mothers (Table 4, Panel C), and white fathers (Table 4, Panel D), Model 1 shows that the association between child death by midlife and parental mortality risk is not significant. This is because the association was not significant for fathers and because educational attainment attenuates this association for white mothers (see Table 2 above). Overall, we find partial support for Hypothesis 3: educational attainment explains the association between child death and parental mortality risk for white mothers, whereas biopsychosocial and behavioral factors explain the association between child death and parental mortality risk for black mothers.

DISCUSSION

Black parents are substantially more likely than white parents to lose a child during their lifetime (Umberson et al., 2017). While prior research documents adverse health consequences and increased mortality risk for parents who lose children (see Hendrickson, 2009 for a review), this prior work primarily relies on European samples (e.g., Cohen-Mansfield et al., 2013; Li et al., 2003; Rostila et al., 2012; Rostila et al., 2015; Werthmann et

al., 2010) and overlooks the substantial burden for black Americans in the United States in their risk of losing a child as well as their own mortality risk. The present study considered how losing a child by midlife is associated with mortality risk in mid- to later-life for black parents and for white parents. We highlight three key themes.

First, we show that studies examining the consequences of losing a child for parents' mortality risk must consider racial context. Black parents in the United States are much more likely to ever lose a child compared to white parents (Umberson et al., 2017). One estimate suggests that 12% of black parents lost a child by age 50 compared to 6% of white parents (Umberson et al., 2017). We build on these estimates by highlighting the importance of considering the intersection of race and gender: 12.8% of black mothers and 8.4% of black fathers lost a child by midlife, compared to 7.2% of white mothers and 4.8% of white fathers. The unequal burden of experiencing the death of a child for black parents reflects the legacy of racism in the United States, as the black-white gap in mortality is largest prior to midlife (Rogers et al., 2019; Kochanek et al., 2019), a period in the life course when deceased persons are most likely to have a living parent who will then be bereaved. Moreover, experiencing the death of a child is a traumatic event for parents, and one that adds to the already greater stress burden and increased mortality risk of black Americans (e.g., Sternthal, Slopen, & Williams, 2011; Williams, Lawrence, & Davis, 2019). The present study shows that differential exposure to the death of a child adds to the racial disparity in mortality risk (Ward et al., 2019), especially for black mothers.

We also find that the consequences of losing a child by midlife for parental mortality risk are not as persistent for black fathers, white fathers, and white mothers. Some prior research finds higher mortality risk for bereaved mothers compared to bereaved fathers (Cohen-Mansfield et al., 2013; Li et al., 2003; Rostila et al., 2012), which aligns with the null findings for black fathers and white fathers in the present study. The finding that educational attainment explains the association between child death and parental mortality risk for white mothers contradicts our hypothesis that this association will be significant for both black parents and for white parents. One possible explanation is that black youth and young adults are more likely than white youth to die from homicide (Khan et al., 2018), and violent and unnatural causes of death tend to have stronger effects on parental mortality risk (Li et al., 2003; Murphy et al., 1999; Rostila et al., 2012). Thus, bereavement effects may persist for a longer period for black mothers who lose their children to violent causes of death. One limitation of the HRS data is that we are not able to assess cause of death for the child who died; future waves of the HRS should ask more questions about the death of a child – an all-too-common and traumatic event in the lives of parents.

The second major theme from our results is that losing a child by midlife is associated with several biopsychosocial and behavioral factors known to be associated with mortality, and some of the most salient factors differ for black and white parents. We find that, for black mothers, losing a child is associated with more psychological distress and chronic conditions. For white mothers, experiencing the death of a child is associated with increased risk of being a smoker and a non-drinker, as well as lower levels of household income and more chronic conditions. Child death by midlife is associated with increased risk of being a non-drinker, as well as higher levels of psychological distress and more chronic conditions

for white fathers. Although the greater likelihood of being a non-drinker may seem counterintuitive, one possible explanation is that parents classified as non-drinkers at baseline could have been heavy drinkers after the loss of their child but chose to abstain at some point in the future. Indeed, results in the present study show that being a non-drinker is associated with increased mortality risk compared to moderate drinkers. Taken together, these findings align with prior bereavement research documenting psychological (Bolton et al., 2013; Murphy et al., 2003; Li et al., 2005; Rogers et al., 2008; Youngblut et al., 2013), social (Albuquerque et al., 2016; Stroebe et al., 2013), behavioral (Stroebe et al., 2007), and physiological (e.g., Hendrickson, 2009) responses to losing a child. These findings also align with the large body of evidence indicating racial differences in responses to stress (e.g., Jackson et al., 2010; Mezuk et al., 2010; Taylor et al., 2007) and in pathways to health (Boen, 2016; Williams et al., 2019; Williams & Mohammed, 2013). We note that due to HRS data limitations and the study design, we do not observe individuals after losing a child but before entering the study. Thus, we cannot confirm the temporal ordering of child death and the biopsychosocial and behavioral risk factors. This may be especially true for health behaviors, which are often established earlier in the life course (Umberson, Crosnoe, & Reczek, 2010) and could have preceded the death of a child.

Although we document several key risk factors associated with child death for white mothers and white fathers, we find fewer statistically significant associations for black mothers and none for black fathers. Future research should aim to understand what other risk factors might be more salient for black parents. Due to data limitations in the HRS, we do not have detailed measures of diet and physical inactivity, which are known coping responses to stress that increase mortality risk and produce health disparities in mid- and later-life (Jackson, Knight, & Rafferty, 2010). Future research should also consider resources that parents may draw on to reduce the mortality risk associated with child death, such as religious coping and social support, with attention to differences for black compared to white parents.

The final theme considers how the *processes* linking child death to parental mortality risk seem to differ for black and white parents. We expand on prior research documenting biopsychosocial and behavioral responses to bereavement by examining to what extent these factors explain linkages between the death of a child and parental mortality risk – a gap in prior research. To this end, our findings suggest that myriad biopsychosocial and behavioral factors attenuate the association between experiencing the death of a child and parental mortality risk for black mothers; however, the magnitude of the coefficient for child death remains relatively large (coef: 0.21 in Table 4, Panel A, Model 6). The models in the present study do not account for other factors in black parents' lives that may contribute to their elevated mortality risk following the death of a child. For example, the additional adversities that black parents in the United States contend with, such as race-based segregation, institutional and interpersonal racism, and other psychosocial and contextual stressors, could shape or amplify reactions to child death.

We also find that educational attainment explains the association of losing a child with parental mortality risk for white mothers, but not black mothers. One explanation for this finding is that white mothers reap more benefits from educational attainment than black

mothers, perhaps because black mothers also contend with racism and race-based stressors throughout their lives (e.g., Sternthal, Slopen, & Williams, 2011; Williams, Lawrence, & Davis, 2019) that dampen the health-enhancing resources derived from educational attainment. Indeed, prior research finds fewer health returns to education for white compared to black Americans (e.g., Boen, 2016; Turner, Brown, & Hale, 2017). Notably, we find that the death of a child still has lasting consequences for the health behaviors, mental health, socioeconomic status, and physical health of white parents, yet these risk factors do not translate to increased mortality risk over the study period. This finding suggests that white parents may be able to use specific resources to offset these risk factors and reduce their impact on mortality risk – an avenue for future research.

This study attends to the largely unexplored question of race differences in the link between the death of a child by midlife with mortality risk in mid- to later-life; however, limitations of the present study must be noted. First, we focus on parental mortality risk during mid- to later-life because the HRS samples adults over age 50, which means we exclude respondents who died before age 50. Thus, selective survival, especially for black adults, may lead to an underestimate of the consequences of child death for parental mortality risk. A second limitation is that the HRS data do not include pertinent details about the child who has died – an unfortunate limitation of most national datasets in the United States. For example, we are unable to determine the age of the child at the time of death, the gender of the child who has died, or the cause of the child's death, all of which have implications for bereaved parents (see Hendrickson, 2009 for a review). Moreover, the age of the child and cause of death likely vary by race in the United States.

Another limitation of the measure of child death in the present study is that it is a retrospective report of loss occurring before parents entered the study. This approach does not allow us to consider differences in mortality risk depending on bereaved parents' age at child death or duration since the death of a child. Moreover, we cannot observe parents' mortality risk prospectively with a retrospective report of child death – an avenue for future research that would be facilitated by the inclusion of repeated questions about child mortality in national longitudinal studies. Finally, we limit the analytic sample to non-Hispanic white and non-Hispanic black parents. We do this because most Latinos in the HRS are foreign-born adults and the mortality conditions in their countries of origin are different than in the United States (Viner et al., 2011); moreover, linked mortality estimates are less accurate for foreign-born compared to native-born respondents (e.g., Lariscy, 2011). Future work should examine how child death is associated with mortality risk for Latinos in the United States, especially considering their favorable mortality outcomes relative to socioeconomic position (e.g., Markides & Eschbach, 2011).

The present study provides evidence that experiencing the death of a child by midlife elevates parental mortality risk in mid- and later-life. Losing a child is a turning point in a parent's life course, and black parents are much more likely than white parents to experience child death during their lifetime (Umberson et al., 2017). Black Americans already face higher mortality rates compared to white Americans, and the unequal burden of child death adds to their mortality risk. We underscore the importance of identifying bereaved parents and developing race-conscious strategies to reduce the long-term consequences for parents.

Perhaps most importantly, policies and programs should aim to reduce the unequal burden of family loss experienced in black communities – a key consideration for improving population health and reducing racial disparities in health and mortality.

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REFERENCES

- Albuquerque S, Pereira M, & Narciso I (2016). Couple's Relationship after the Death of a Child: A systematic review. *Journal of Child and Family Studies*, 25(1), 30–53.
- Boen C (2016). The role of socioeconomic factors in Black-White health inequities across the life course: Point-in-time measures, long-term exposures, and differential health returns. *Social Science & Medicine*, 170, 63–76. [PubMed: 27764654]
- Bolton JM, Au W, Leslie WD, Martens PJ, Enns MW, Roos LL, Katz LY, Wilcox HC, Erlangsen A, Chateau D, Walld R, Spiwak R, Seguin M, Shear K, Sareen J (2013). Parents bereaved by offspring suicide: a population-based longitudinal case-control study. *JAMA Psychiatry*, 70, 158–167. [PubMed: 23229880]
- Cohen-Mansfield J, Shmotkin D, Malkinson R, Bartur L, Hazan H (2013). Parental bereavement increases mortality in older persons. *Psychological Trauma: Theory, Research, Practice, and Policy*, 5(1), 84–92.
- Collins PH (2009). *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment*. London, UK: Harper Collins
- Danese A & McEwan BS (2012). Adverse childhood experiences, allostasis, allostatic load, and age-related disease. *Physiology & Behavior*, 106(1), 29–39. [PubMed: 21888923]
- Espinosa J & Evans WN (2013). Maternal bereavement: The heightened mortality of mothers after the death of a child. *Economics & Human Biology*, 11(3), 371–381. [PubMed: 22809832]
- Finnäs F, Rostila M, & Saarela J (2018). Divorce and parity progression following the death of a child: A register-based study from Finland. *Population Studies*, 72(1), 41–51. [PubMed: 28789590]
- Geronimus AT, Hicken M, Keene D, & Bound J (2006). "Weathering" and Age Patterns of Allostatic Load Scores Among Blacks and Whites in the United States. *American Journal of Public Health*, 96(5), 826–833. [PubMed: 16380565]
- Heeringa SG, West BT, & Berglund PA (2017). *Applied Survey Data Analysis 2nd Edition*. New York: Chapman and Hall/CRC Press.
- Hendrickson KC (2009). Morbidity, mortality, and parental grief: a review of the literature on the relationship between the death of a child and the subsequent health of parents. *Palliative & Supportive Care*, 9(7), 109–19.
- Jackson JS (2002). Health and mental health disparities among Black Americans In Hager M (Ed.), *Modern Psychiatry: Challenges in Educating Health Professionals to Meet New Needs* (pp. 246–254). New York, NY: Josiah Macy Jr. Foundation.
- Jackson JS, Knight KM, & Rafferty JA (2010). 'Race and unhealthy behaviors: Chronic stress, the HPA axis, and physical and mental health disparities over the life-course. *American Journal of Public Health*, 100, 933–939. [PubMed: 19846689]
- Khan SQ, Berrington de Gonzalez A, Best AF, Chen Y, Haozous EA, Rodriguez EJ, ... Shiels MS (2018). Infant and youth mortality trends by race/ethnicity and cause of death in the United States. *JAMA Pediatrics*, 172(12), e183317. [PubMed: 30285034]
- Kochanek KD, Murphy SL, Xu J, Arias E (2019). *Deaths: Final Data for 2017*. National Vital Statistics Reports, 68(9). Hyattsville, MD: National Center for Health Statistics.
- Lachman ME (2004). Development in Midlife. *Annual Review of Psychology* 55, 305–331.

- Lariscy JT (2011). Differential Record Linkage by Hispanic Ethnicity and Age in Linked Mortality Studies: Implications for the Epidemiologic Paradox. *Journal of Aging and Health*, 23(8), 1263–1284. [PubMed: 21934120]
- Li J, Precht DH, Mortensen PB, & Olsen J (2003). Mortality in parents after death of a child in Denmark: A nationwide follow-up study. *The Lancet*, 361, 363–367.
- Li J, Laursen TM, Precht DH, Olsen J, Mortensen PB (2005). Hospitalization for mental illness among parents after the death of a child. *New England Journal of Medicine*, 352, 1190–1196. [PubMed: 15788495]
- Lin JC, Guerrieri JG, & Moore AA (2011). Drinking patterns and the development of functional limitations in older adults: Longitudinal analyses of the Health and Retirement Survey. *Journal of Aging and Health*, 23(5), 806–821. [PubMed: 21311049]
- Markides KS & Eschbach K (2011). Hispanic Paradox in Adult Mortality in the United States In Rogers RG & Crimmins EM (Eds.), *International Handbook of Adult Mortality* (pp. 227–240). New York: Springer.
- Masters RK, Hummer RA, & Powers DA (2012). Educational differences in U.S. adult mortality: A cohort perspective. *American Sociological Review*, 77(4), 548–572. [PubMed: 25346542]
- Mezuk B, Abdou CM, Hudson D, Kershaw KN, Rafferty JA, Lee H, & Jackson JS (2013). ‘White box’ epidemiology and the social neuroscience of health behaviors: The Environmental Affordances Model. *Society and Mental Health*, 3(2), 79–95.
- Mezuk B, Rafferty JA, Kershaw KN, Hudson D, Abdou CM, Lee H, Eaton WW, & Jackson JS (2010). Reconsidering the role of social disadvantage in physical and mental health: Stressful life events, health behaviors, race, and depression. *American Journal of Epidemiology* 172, 1238–49. [PubMed: 20884682]
- Murphy SA, Johnson LK, Chung IJ, & Beaton RD (2003). The Prevalence of PTSD Following the Violent Death of a Child and Predictors of Change 5 Years Later. *Journal of Traumatic Stress*, 16(1), 17–25. [PubMed: 12602648]
- Murphy SA, Lohan J, Braun T, et al. (1999). Parents’ health, health care utilization, and health behaviours following violent deaths of their 12- to 28-year-old children: a prospective longitudinal analysis. *Death Studies*, 23, 589–616. [PubMed: 10915453]
- Pearlin LI & Skaff MM (1996). Stress and the Life Course: A Paradigmatic Alliance. *The Gerontologist*, 36(2), 239–247. [PubMed: 8920095]
- Pearlin LI, Schieman S, Fazio EM, & Meersman SC (2005). Stress, Health and the Life Course: Some Conceptual Perspectives. *Journal of Health and Social Behavior*, 46(2), 205–219. [PubMed: 16028458]
- Rogers CH, Floyd FJ, Seltzer MM, Greenberg J, & Hong J (2008). Long-term effects of the death of a child on parents’ adjustment in midlife. *Journal of Family Psychology*, 22(2), 203–211. [PubMed: 18410207]
- Rogers RG, Hummer RA, Krueger PM, & Vinneau JM (2019). Adult mortality In *Handbook of Population* (pp. 355–381). Springer, Cham.
- Rostila M, Saarela J, Kawachi I (2012). Mortality in parents following the death of a child: a nationwide follow-up study from Sweden. *Journal of Epidemiology and Community Health*, 66, 927–33 [PubMed: 22045850]
- Rostila M, Saarela J, Kawachi I et al. (2015). Testing the anniversary reaction: causal effects of bereavement in a nationwide follow-up study from Sweden. *European Journal of Epidemiology*, 30(3), 239–247. [PubMed: 25595319]
- Schorr L, Burger A, Hochner H, Calderon R, Manor O, Fridlander Y, Laurence GM, Paltiel O (2016). Mortality, cancer incidence, and survival in parents after bereavement. *Annals of Epidemiology*, 26, 115–121. [PubMed: 26809234]
- Seeman TE, McEwen BS, Rowe JW, & Singer BH (2001). Allostatic load as a marker of cumulative biological risk: MacArthur studies of successful aging. *Proceedings of the National Academy of Sciences*, 98(8), 4770–4775.
- Song J, Mailick MR, Greenberg JS, Floyd FJ (2019). Mortality in parents after the death of a child. *Social Science & Medicine*, 239.

- Steffick DE (2000). Documentation of affective functioning measures in the Health and Retirement Study. Ann Arbor, Michigan: Institute for Social Research, University of Michigan.
- Stroebe M, Finkenauer C, Wijngaards-de Meij L, Schut J, van den Bout J, Stroebe W (2013). Partner-Oriented Self-Regulation Among Bereaved Parents: The Costs of Holding in Grief for the Partner's Sake. *Psychological Science*, 24(4), 395–402. [PubMed: 23406609]
- Stroebe M, Schut H, & Stroebe W (2007). Health outcomes of bereavement. *Lancet*, 370(9603), 1960–1973. [PubMed: 18068517]
- Sternthal MJ, Slopen N, & Williams DR (2011). Racial Disparities in Health: How much does stress really matter? *Du Bois Review: Social Science Research on Race*, 8(1), 95–113. [PubMed: 29887911]
- Taylor RJ, Chatters LM, and Jackson JS (2007). Religious and spiritual involvement among older African Americans, Caribbean Blacks, and Non-Hispanic Whites: Findings from the National Survey of American Life. *The Journals of Gerontology: Series B*, 62(4), S238–S250.
- Thakrar AP, Forrest AD, Maltenfort MG, Forrest CB (2018). Child Mortality in the US and 19 OECD Comparator Nations: A 50-Year Time-Trend Analysis. *Health Affairs*, 37(1), 140–149. [PubMed: 29309221]
- Toitso PA (2010). Stress and health: Major findings and policy implications. *Journal of Health and Social Behavior*, 55(S1), S41–53.
- Turner RJ, Brown TN, & Hale WB (2017). Race, socioeconomic position, and physical health: A descriptive analysis. *Journal of Health and Social Behavior*, 58(1), 23–36. [PubMed: 28661769]
- Umberson D, Crosnoe R, & Reczek C (2010). Social relationships and health behavior across the life course. *Annual Review of Sociology*, 36, 139–157.
- Umberson D, Olson JS, Crosnoe R, Liu H, Pudrovska T, & Donnelly R (2017). Death of family members as an overlooked source of racial disadvantage in the United States. *Proceedings of the National Academy of Sciences*, 114(5), 915.
- Viner RM, Coffey C, Mathers C, Bloem P, Costello A, Santelli J & Patton GC (2011). 50-year mortality trends in children and young people: A study of 50 low-income, middle-income, and high-income countries. *The Lancet*, 377, 1162–1174.
- Ward JB, Gartner DR, Keyes KM, Fliss MD, McClure ES, Robinson WR (2019). How do we assess a racial disparity in health? Distribution, interaction, and interpretation in epidemiological studies. *Annals of Epidemiology*, 29(1), 1–7. [PubMed: 30342887]
- Weir DR (2016). Validating Mortality Ascertainment in the Health and Retirement Study. Retrieved from https://hrs.isr.umich.edu/sites/default/files/biblio/Weir_mortality_ascertainment.pdf
- Werthmann J, Smits LJM, & Li J (2010). Parental mortality rates in a western country after the death of a child: Assessment of the role of the child's sex. *Gender Medicine*, 7(1), 39–46. [PubMed: 20189153]
- Winship C & Radbill L (1994). Sampling Weights and Regression Analysis. *Sociological Methods & Research*, 23(2), 230–257.
- Whitfield K, & Baker T (2014). *Handbook of Minority Aging*. Springer 1 Publishing Company.
- Williams DR, Lawrence JA, & Davis BA (2019). Racism and health: Evidence and needed research. *Annual Review of Public Health*, 40, 105–125.
- Williams DR & Mohammed SA (2013). Racism and Health: Pathways and Scientific Evidence. *American Behavioral Scientist*, 57(8), 1152–1173.
- Youngblut JA, Brooten D, Cantwell GP, del Moral T, Totapally B (2013). Parent Health and Functioning 13 Months after Infant or Child NICU/PICU Death. *Pediatrics*, 132(5), e1295–e1301. [PubMed: 24101760]

HIGHLIGHTS

- Black mothers are most likely to experience the death of a child by midlife.
- Child death increases mortality risk for aging black mothers and white mothers.
- Educational attainment explains this association for white mothers.
- Biopsychosocial and behavioral factors explain this association for black mothers.
- The processes linking child death to parental mortality differ by race.

Table 1.

Weighted Descriptive Statistics for the Sample (HRS 1996–2016)

	Non-Hispanic Black Mothers % or Mean (SD)		Non-Hispanic Black Fathers % or Mean (SD)		Non-Hispanic White Mothers % or Mean (SD)		Non-Hispanic White Fathers % or Mean (SD)	
Child Loss by Midlife	12.81		8.44		7.21		4.81	
#Other Losses by Midlife	1.12	(0.02)	1.02	(0.03)	0.98	(0.02)	0.89	(0.01)
Age at Baseline	54.30	(0.13)	54.49	(0.10)	54.15	(0.06)	54.16	(0.05)
Foreign-Born	5.78		9.88		3.58		3.96	
Education								
Less than high school	23.11		24.67		8.37		7.98	
High school/GED	31.51		30.20		36.78		32.17	
Some college	30.61		26.88		28.85		27.25	
College+	14.76		18.25		26.01		32.59	
Born in the South	64.34		62.73		28.76		28.42	
No Health Insurance (Baseline)	20.82		17.49		9.33		9.26	
Baseline Alcohol Use								
Non-Drinker	74.43		56.44		61.99		44.74	
Moderate Drinker	21.49		29.27		30.74		33.01	
Heavy Drinker	4.08		14.29		7.27		22.25	
Baseline Current Smoker	25.26		35.73		23.61		24.86	
Baseline Marital Status								
Married	40.77		66.41		73.83		84.54	
Divorced	33.51		23.92		19.75		13.58	
Widowed	11.79		2.72		5.09		0.94	
Never Married	13.93		6.95		1.33		0.94	
BMI at Baseline	31.80	(0.22)	28.60	(0.22)	27.62	(0.13)	28.36	(0.10)
# Chronic Conditions at Baseline	1.76	(0.04)	1.46	(0.06)	1.30	(0.03)	1.16	(0.02)
Baseline Psychological Distress	2.12	(0.07)	1.96	(0.08)	1.46	(0.04)	1.19	(0.05)
Baseline Household Income (Log)	5.48	(0.05)	6.13	(0.09)	7.05	(0.05)	7.39	(0.07)
Died	16.45		20.46		13.05		16.90	
Unweighted number of deaths	342		278		832		905	
Unweighted number of parents	2,084		1,270		5,322		4,112	

Note: Mean and standard deviation (in parentheses) are presented for continuous variables. Percentages are presented for categorical variables.

Discrete Time Hazard Models Predicting Mortality among White and Black Parents (HRS 1996–2016)

Table 2.

	Panel A: Black Mothers		Panel B: Black Fathers		Panel C: White Mothers		Panel D: White Fathers	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Child Loss by Midlife	0.41** (0.14)	0.31* (0.15)	0.08 (0.19)	0.06 (0.19)	0.22+ (0.12)	0.13 (0.12)	0.08 (0.15)	0.03 (0.15)
Foreign-Born (1=yes)	-1.05** (0.37)	-1.13** (0.36)	-1.29** (0.46)	-1.37** (0.45)	0.08 (0.17)	0.02 (0.17)	-0.34+ (0.19)	-0.31 (0.20)
Born in South (1=yes)	0.16 (0.11)	0.11 (0.12)	0.28* (0.11)	0.20 (0.12)	0.21* (0.08)	0.11 (0.08)	0.22** (0.08)	0.15+ (0.08)
# Other Losses by Midlife	0.15** (0.06)	0.14* (0.06)	0.22** (0.07)	0.21** (0.07)	0.19*** (0.04)	0.15** (0.04)	0.13* (0.05)	0.09+ (0.05)
Age (centered at 50)	0.08*** (0.01)	0.08*** (0.01)	0.08*** (0.01)	0.08*** (0.01)	0.10*** (0.01)	0.10*** (0.01)	0.10*** (0.01)	0.10*** (0.01)
No Health Insurance at Baseline (1=yes)		0.08 (0.12)		0.43** (0.16)		0.45*** (0.12)		0.40*** (0.11)
HS (ref: LTHS)		-0.10 (0.14)		-0.08 (0.13)		-0.58*** (0.08)		-0.41*** (0.08)
Some College (ref: LTHS)		-0.46* (0.18)		-0.32 (0.19)		-0.71*** (0.10)		-0.31** (0.10)
College+ (ref: LTHS)		-0.72*** (0.17)		-0.17 (0.28)		-1.18*** (0.14)		-0.99*** (0.13)
Constant	-5.05*** (0.15)	-4.75*** (0.21)	-4.81*** (0.18)	-4.71*** (0.24)	-5.72*** (0.08)	-5.05*** (0.11)	-5.19*** (0.09)	-4.71*** (0.14)

Note. Standard errors in parentheses;

*** p<0.001,

** p<0.01,

* p<0.05,

+ p<0.10

Table 3
 Baseline Measures of Biopsychosocial and Behavioral Outcomes Regressed on Child Loss by Midlife for Black Mothers (HRS 1996–2016)

	Panel A: Black Mothers																	
	Drinking Status ¹				Marital Status ²				Distress				Household Income		Chronic Conditions			
	Current Smoker	Non-Drinker	Heavy Drinker		Divorced	Widowed	Never Married		Model 4	Model 5	BMI	Model 6	Model 7	Model 4	Model 5	BMI	Model 6	Model 7
Child Loss by Midlife	-0.04 (0.15)	0.31 (0.21)	0.22 (0.34)	-0.02 (0.19)	-0.05 (0.21)	-0.52 [±] (0.30)	0.46 [*] (0.18)	0.05 (0.10)	0.22 (0.45)	0.40 ^{***} (0.11)								
Foreign-Born (1=yes)	-2.82 ^{***} (0.37)	0.33 (0.22)	-0.83 (0.60)	-0.35 [*] (0.17)	-0.47 (0.40)	-1.53 ^{**} (0.44)	-0.10 (0.17)	0.47 [±] (0.26)	-1.90 ^{***} (0.51)	-0.64 ^{***} (0.08)								
Born in South (1=yes)	-0.58 ^{***} (0.12)	0.28 ^{**} (0.10)	-0.05 (0.24)	-0.24 [*] (0.11)	-0.00 (0.18)	-0.66 ^{***} (0.17)	-0.01 (0.10)	0.07 (0.09)	-0.04 (0.40)	-0.04 (0.06)								
# Losses by Midlife	0.02 (0.05)	0.09 (0.09)	0.00 -0.16	-0.00 (0.07)	0.72 ^{***} (0.11)	-0.02 (0.09)	0.10 [±] (0.06)	-0.06 (0.04)	0.32 (0.20)	0.11 ^{**} (0.04)								
Age (centered at 50)	-0.04 ^{**} (0.01)	0.01 (0.01)	0.04 (0.03)	0.15 ^{***} (0.02)	0.22 ^{***} (0.02)	0.17 ^{***} (0.02)	0.03 [*] (0.01)	-0.05 ^{***} (0.01)	0.00 (0.04)	0.05 ^{***} (0.01)								
No Health Insurance (Baseline; 1=yes)	0.51 ^{***} (0.14)	-0.31 [±] (0.17)	0.20 (0.28)	0.31 [*] (0.13)	-0.08 (0.20)	0.58 ^{**} (0.18)	0.07 (0.15)	0.03 (0.09)	-0.73 [±] (0.43)	-0.29 ^{**} (0.09)								
HS (ref: LTHS)	-0.28 [*] (0.12)	-0.30 (0.19)	-0.55 [*] (0.24)	-0.04 (0.16)	-0.76 ^{***} (0.20)	-0.32 (0.23)	-0.63 ^{***} (0.14)	0.41 ^{***} (0.09)	-0.39 (0.35)	-0.50 ^{***} (0.08)								
Some College (ref: LTHS)	-0.71 ^{***} (0.14)	-0.40 [*] (0.17)	-1.12 ^{***} (0.28)	0.05 (0.14)	-0.35 [±] (0.19)	-0.22 (0.21)	-0.95 ^{***} (0.13)	0.65 ^{***} (0.09)	-0.40 (0.44)	-0.52 ^{***} (0.09)								
College [±] (ref: LTHS)	-1.21 ^{***} (0.21)	-0.34 (0.24)	-1.36 [*] (0.51)	-0.32 (0.21)	-1.09 ^{***} (0.21)	-1.15 ^{***} (0.31)	-1.55 ^{***} (0.16)	1.68 ^{***} (0.16)	-0.87 [±] (0.46)	-0.86 ^{***} (0.08)								
Constant	1.89 [*] (0.77)	0.60 (0.71)	-2.77 (1.85)	-8.18 ^{***} (0.84)	-13.36 ^{***} (1.29)	-9.94 ^{***} (1.27)	0.95 (0.61)	7.50 ^{***} (0.67)	31.61 ^{***} (2.14)	-0.26 (0.43)								

	Panel B: Black Fathers																	
	Drinking Status ¹				Marital Status ²				Distress				Household Income		Chronic Conditions			
	Current Smoker	Non-Drinker	Heavy Drinker		Divorced	Widowed	Never Married		Model 4	Model 5	BMI	Model 6	Model 7	Model 4	Model 5	BMI	Model 6	Model 7
Child Loss by Midlife	0.14 (0.18)	0.22 (0.27)	0.40 (0.38)	-0.07 (0.28)	0.56 (0.45)	0.32 (0.33)	-0.11 (0.15)	-0.26 (0.20)	-0.93 (0.66)	-0.17 (0.11)								

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Foreign-Born (1=yes)	-1.32*** -0.28	0.01 (0.25)	-0.73 ⁺ (0.38)	-0.39 (0.27)	-1.47 ⁺ (0.85)	-1.38 (0.97)	-0.17 (0.19)	0.67* (0.31)	-0.83 (0.50)	-0.44*** (0.11)
Born in South (1=yes)	-0.25 ⁺ (0.13)	0.13 (0.13)	-0.08 (0.19)	-0.18 (0.20)	-0.74* (0.34)	-0.78** (0.26)	-0.07 (0.13)	0.17 (0.14)	-0.69 ⁺ (0.40)	0.03 (0.08)
# Losses by Midlife	0.01 (0.08)	-0.08 (0.10)	-0.11 (0.12)	-0.08 (0.08)	1.09*** (0.27)	0.04 (0.15)	0.01 (0.07)	0.06 (0.07)	-0.09 (0.17)	0.15*** (0.05)
Age (centered at 50)	-0.02 (0.02)	0.04 ⁺ (0.02)	-0.01 (0.03)	0.04* (0.02)	0.10* (0.05)	0.04 (0.04)	-0.00 (0.02)	0.00 (0.02)	-0.10 ⁺ (0.05)	0.06*** (0.01)
No Health Insurance (Baseline; 1=yes)	0.46* (0.18)	-0.30 ⁺ (0.16)	0.16 (0.17)	0.28 (0.18)	0.57 (0.38)	0.83** (0.29)	0.29 ⁺ (0.15)	0.29 ⁺ (0.15)	-0.98* (0.38)	-0.25** (0.09)
HS (ref: LTHS)	-0.39* (0.17)	0.05 (0.16)	0.12 (0.22)	0.27 (0.16)	0.12 (0.36)	-0.44 (0.30)	-0.44** (0.16)	0.33* (0.13)	1.16** (0.35)	-0.13 (0.09)
Some College (ref: LTHS)	-0.73** (0.23)	-0.45* (0.19)	-0.57* (0.26)	0.36 ⁺ (0.18)	-0.40 (0.51)	-1.13* (0.44)	-0.94*** (0.18)	0.89*** (0.16)	1.20** (0.38)	-0.16 (0.12)
College ⁺ (ref: LTHS)	-1.42*** (0.26)	-0.17 (0.24)	-0.83* (0.32)	-0.11 (0.24)	-0.12 (0.52)	-0.93 ⁺ (0.48)	-1.28*** (0.19)	2.17*** (0.24)	1.50*** (0.42)	-0.42** (0.13)
Constant	1.30 (1.09)	-1.32 (1.23)	0.11 (1.52)	-3.52** (1.17)	-9.57*** (2.73)	-4.21 ⁺ (2.31)	2.70* (1.05)	4.86*** (0.89)	34.01*** (2.91)	-1.79** (0.58)

Panel C: White Mothers

	Drinking Status ¹							Marital Status ²								
	Current Smoker		Non-Drinker		Heavy Drinker		Divorced	Widowed	Never Married	Distress	Household Income		BMI		Chronic Conditions	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2					Model 3	Model 4	Model 5	Model 6	Model 7	Model 6
Child Loss by Midlife	0.37*** (0.10)	0.38** (0.12)	0.27 (0.21)	0.20 (0.14)	0.17 (0.22)	-0.48 (0.78)	0.06 (0.09)	-0.24* (0.11)	-0.29 (0.31)	0.24** (0.08)						
Foreign-Born (1=yes)	-0.38 ⁺ (0.21)	-0.15 (0.15)	0.04 (0.27)	-0.33 (0.22)	-0.98 ⁺ (0.53)	-0.42 (1.08)	0.02 (0.12)	0.44* (0.17)	-0.79* (0.39)	-0.13 (0.08)						
Born in South (1=yes)	0.04 (0.07)	0.42*** (0.09)	0.14 (0.12)	-0.10 (0.08)	0.05 (0.12)	-0.17 (0.38)	0.14** (0.05)	-0.01 (0.08)	-0.25 (0.19)	0.09* (0.04)						
# Losses by Midlife	0.13** (0.04)	0.07 ⁺ (0.04)	0.04 (0.08)	-0.03 (0.05)	0.48*** (0.10)	0.29 (0.20)	0.01 (0.03)	-0.09 ⁺ (0.05)	0.26* (0.11)	0.09*** (0.02)						
Age (centered at 50)	-0.02** (0.01)	-0.00 (0.01)	0.00 (0.02)	0.15*** (0.01)	0.18*** (0.02)	0.20*** (0.05)	0.00 (0.01)	-0.03*** (0.01)	-0.01 (0.02)	0.04*** (0.00)						
No Health Insurance (Baseline; 1=yes)	0.55*** (0.11)	0.16 (0.11)	0.55*** (0.16)	0.87*** (0.12)	0.18 (0.21)	0.98* (0.45)	0.29** (0.11)	-0.26* (0.11)	0.75* (0.36)	0.04 (0.07)						

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	Drinking Status							Marital Status							
	Current Smoker		Non-Drinker		Heavy Drinker		Divorced	Widowed	Never Married	Distress	Household Income		BMI	Chronic Conditions	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2					Model 3	Model 4		Model 5	Model 6
HS (ref: LTHS)	-0.65*** (0.08)	-0.54*** (0.12)	-0.54** (0.19)	-0.07 (0.13)	-0.54** (0.18)	0.06 (0.61)	-0.86*** (0.11)	0.55*** (0.08)	-0.29 (0.34)	-0.54*** (0.08)					
Some College (ref: LTHS)	-0.85*** (0.08)	-0.91*** (0.12)	-0.66** (0.20)	0.11 (0.13)	-1.18*** (0.23)	0.08 (0.55)	-0.96*** (0.11)	1.02*** (0.12)	-0.53 (0.33)	-0.58*** (0.08)					
College ⁺ (ref: LTHS)	-1.76*** (0.11)	-1.40*** (0.13)	-0.59** (0.21)	0.09 (0.13)	-1.28*** (0.25)	-0.36 (0.64)	-1.31*** (0.12)	1.69*** (0.12)	-1.98*** (0.35)	-0.92*** (0.09)					
Constant	0.67 (0.42)	1.41** (0.52)	-1.21 (0.85)	-9.87*** (0.69)	-12.06*** (1.15)	-15.44*** (2.49)	2.02*** (0.30)	8.23*** (0.38)	28.37*** (1.33)	-0.47 ⁺ (0.26)					

Panel D: White Fathers

	Drinking Status							Marital Status							
	Current Smoker		Non-Drinker		Heavy Drinker		Divorced	Widowed	Never Married	Distress	Household Income		BMI	Chronic Conditions	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2					Model 3	Model 4		Model 5	Model 6
Child Loss by Midlife	-0.11 (0.19)	0.43* (0.19)	0.31 (0.25)	0.29 (0.18)	0.47 (0.55)	0.92 (0.67)	0.44** (0.14)	-0.06 (0.17)	-0.54 (0.34)	0.18* (0.08)					
Foreign-Born (1=yes)	-0.44* (0.18)	-0.20 (0.19)	-0.12 (0.22)	-0.98* (0.39)	-14.37*** (0.24)	-14.02*** (0.24)	-0.20 ⁺ (0.11)	-0.04 (0.20)	-0.49 (0.34)	-0.19* (0.08)					
Born in South (1=yes)	-0.00 (0.07)	0.31*** (0.08)	-0.12 (0.11)	-0.13 (0.11)	0.02 (0.26)	-0.42 (0.45)	0.29*** (0.06)	-0.10 (0.08)	0.07 (0.16)	0.20*** (0.04)					
# Losses by Midlife	0.09* (0.04)	-0.04 (0.05)	-0.12* (0.06)	0.09 (0.07)	0.69* (0.26)	-0.29 (0.25)	0.01 (0.04)	-0.09 (0.05)	0.03 (0.07)	0.09*** (0.03)					
Age (centered at 50)	-0.04* (0.02)	-0.00 (0.01)	-0.01 (0.02)	0.04 ⁺ (0.02)	0.04 (0.07)	-0.00 (0.04)	-0.00 (0.01)	0.03** (0.01)	-0.01 (0.03)	0.05*** (0.01)					
No Health Insurance (Baseline; 1=yes)	0.81*** (0.11)	0.20 (0.15)	0.67*** (0.14)	1.17*** (0.13)	0.28 (0.45)	1.43*** (0.35)	0.71*** (0.11)	0.10 (0.12)	-0.08 (0.25)	-0.13* (0.07)					
HS (ref: LTHS)	-0.67*** (0.13)	-0.50*** (0.14)	-0.21 (0.18)	0.12 (0.21)	-0.70 (0.46)	1.33 (0.95)	-0.53*** (0.12)	0.35** (0.13)	0.30 (0.34)	-0.31*** (0.07)					
Some College (ref: LTHS)	-0.80*** (0.16)	-0.75*** (0.14)	-0.40* (0.18)	0.04 (0.19)	-0.14 (0.59)	1.41 ⁺ (0.81)	-0.69*** (0.11)	0.85*** (0.16)	0.20 (0.35)	-0.31*** (0.08)					
College ⁺ (ref: LTHS)	-1.67*** (0.16)	-1.27*** (0.14)	-0.82*** (0.17)	-0.35 (0.21)	-0.73 (0.44)	0.22 (1.18)	-0.97*** (0.11)	1.80*** (0.14)	-0.64* (0.32)	-0.68*** (0.07)					
Constant	1.69* (0.84)	1.33 ⁺ (0.78)	0.93 (0.92)	-4.45*** (1.19)	-6.88 ⁺ (3.74)	-5.63* (2.43)	1.80** (0.61)	5.04*** (0.61)	28.88*** (0.42)	-1.20** (0.43)					

Note. Standard errors in parentheses;

*** p<0.001,

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1, p<0.01
* p<0.05
+ p<0.10
/ Reference: moderate drinker;
2 Reference: currently married

Table 4.

Discrete Time Hazard Models Predicting Mortality, with Biopsychosocial and Behavioral Risk Factors for Black Mothers (HRS 1996–2016)

Panel A: Black Mothers						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Child Loss by Midlife	0.31 [*] (0.15)	0.32 [*] (0.15)	0.27 ⁺ (0.14)	0.32 [*] (0.15)	0.19 (0.13)	0.21 (0.14)
Foreign-Born (1=yes)	-1.13 ^{**} (0.36)	-0.98 [*] (0.48)	-1.22 [*] -0.48	-1.06 ^{**} (0.36)	-0.90 [*] (0.36)	-0.60 -0.48
Born in South (1=yes)	0.11 (0.12)	0.20 (0.12)	0.10 (0.12)	0.12 (0.12)	0.12 (0.12)	0.22 (0.13)
# Losses by Midlife	0.14 [*] (0.06)	0.13 [*] (0.06)	0.11 ⁺ (0.06)	0.13 [*] (0.06)	0.09 (0.06)	0.07 (0.07)
Age (centered at 50)	0.08 ^{***} (0.01)	0.09 ^{***} (0.01)	0.08 ^{***} (0.01)	0.08 ^{***} (0.01)	0.08 ^{***} (0.01)	0.09 ^{***} (0.01)
No Health Insurance (Baseline; 1=yes)	0.08 (0.12)	0.01 (0.12)	0.11 (0.12)	0.06 (0.12)	0.16 (0.12)	0.07 (0.11)
HS (ref: LTHS)	-0.10 (0.14)	-0.05 (0.14)	-0.05 (0.14)	-0.04 (0.14)	0.04 (0.14)	0.11 (0.14)
Some College (ref: LTHS)	-0.46 [*] (0.18)	-0.34 ⁺ (0.18)	-0.44 [*] (0.19)	-0.37 [*] (0.18)	-0.30 ⁺ (0.17)	-0.21 (0.17)
College ⁺ (ref: LTHS)	-0.72 ^{***} (0.17)	-0.56 ^{**} (0.18)	-0.64 ^{**} (0.19)	-0.51 [*] (0.20)	-0.40 [*] (0.18)	-0.17 (0.22)
Current Smoker (ref: Non-Smoker)		0.75 ^{***} (0.14)				0.81 ^{***} (0.14)
Non-Drinker (ref: Moderate Drinker)		0.33 ⁺ (0.17)				0.15 (0.17)
Heavy-Drinker (ref: Moderate Drinker)		0.40 (0.33)				0.36 (0.35)
Psychological Distress (Range 0–8)			0.06 [*] (0.03)			-0.06 ⁺ (0.03)
Divorced (ref: Married)				-0.04 (0.14)		-0.13 (0.14)
Separated (ref: Married)				0.07 (0.18)		0.06 (0.17)
Never Married (ref: Married)				0.18 (0.23)		0.15 (0.26)
Household Income (log)				-0.12 [*] (0.05)		-0.09 ⁺ (0.05)
BMI					-0.02 (0.01)	-0.00 (0.01)
Chronic Conditions (Range 0–9)					0.34 ^{***} (0.04)	0.36 ^{***} (0.04)
Constant	-4.75 ^{***} (0.21)	-5.44 ^{***} (0.26)	-4.93 ^{***} (0.25)	-4.19 ^{***} (0.36)	-5.06 ^{***} (0.42)	-5.52 ^{***} (0.46)
Panel B: Black Fathers						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Child Loss by Midlife	0.06 (0.19)	0.00 (0.21)	0.09 (0.19)	0.04 (0.19)	0.15 (0.17)	0.09 (0.20)
Foreign-Born (1=yes)	-1.37 ^{**} (0.45)	-1.24 ^{**} (0.46)	-1.33 ^{**} (0.46)	-1.27 ^{**} (0.46)	-1.25 ^{**} (0.45)	-1.05 [*] (0.46)
Born in South (1=yes)	0.20 (0.12)	0.24 ⁺ (0.13)	0.13 (0.12)	0.24 ⁺ (0.13)	0.16 (0.12)	0.16 (0.12)
# Losses by Midlife	0.21 ^{**} (0.07)	0.25 ^{***} (0.07)	0.25 ^{***} (0.07)	0.19 ^{**} (0.07)	0.17 [*] (0.07)	0.25 ^{**} (0.08)
Age (centered at 50)	0.08 ^{***} (0.01)	0.09 ^{***} (0.01)	0.09 ^{***} (0.01)	0.09 ^{***} (0.01)	0.09 ^{***} (0.01)	0.11 ^{***} (0.01)
No Health Insurance (Baseline; 1=yes)	0.43 ^{**} (0.16)	0.43 ^{**} (0.16)	0.37 [*] (0.16)	0.40 [*] (0.16)	0.47 ^{**} (0.15)	0.47 ^{**} (0.15)
HS (ref: LTHS)	-0.08 (0.13)	-0.07 (0.13)	0.01 (0.14)	-0.08 (0.13)	0.04 (0.12)	0.07 (0.13)

Some College (ref: LTHS)	-0.32 (0.19)	-0.19 (0.18)	-0.14 (0.19)	-0.28 (0.19)	-0.22 (0.18)	-0.03 (0.16)
College ⁺ (ref: LTHS)	-0.17 (0.28)	0.03 (0.27)	0.03 (0.29)	-0.02 (0.29)	0.06 (0.27)	0.38 (0.28)
Current Smoker (ref: Non-Smoker)		0.78 *** (0.13)				0.72 *** (0.16)
Non-Drinker (ref: Moderate Drinker)		0.23 (0.16)				0.26 (0.18)
Heavy-Drinker (ref: Moderate Drinker)		-0.02 (0.21)				0.06 (0.21)
Psychological Distress (Range 0–8)			0.16 *** (0.03)			0.09 * (0.03)
Divorced (ref: Married)				0.47 ** (0.16)		0.39 ** (0.15)
Separated (ref: Married)				0.58 * (0.26)		0.39 ⁺ (0.22)
Never Married (ref: Married)				0.35 (0.37)		0.24 (0.39)
Household Income (log)				-0.06 ⁺ (0.03)		-0.04 (0.03)
BMI					-0.04 ** (0.02)	-0.02 (0.02)
Chronic Conditions (Range 0–9)					0.38 *** (0.04)	0.32 *** (0.05)
Constant	-4.71 *** (0.24)	-5.38 *** (0.30)	-5.29 *** (0.25)	-4.61 *** (0.32)	-4.25 *** (0.54)	-5.88 *** (0.70)

Panel C: White Mothers

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Child Loss by Midlife	0.13 (0.12)	0.01 (0.11)	0.11 (0.12)	0.07 (0.13)	0.05 (0.13)	-0.10 (0.12)
Foreign-Born (1=yes)	0.02 (0.17)	0.17 (0.17)	0.03 (0.18)	0.12 (0.16)	0.13 (0.17)	0.31 ⁺ (0.18)
Born in South (1=yes)	0.11 (0.08)	0.06 (0.08)	0.07 (0.09)	0.11 (0.08)	0.05 (0.09)	0.03 (0.09)
# Losses by Midlife	0.15 ** (0.04)	0.14 ** (0.05)	0.16 *** (0.04)	0.14 ** (0.05)	0.13 * (0.05)	0.12 * (0.05)
Age (centered at 50)	0.10 *** (0.01)	0.11 *** (0.01)	0.10 *** (0.01)	0.10 *** (0.01)	0.10 *** (0.01)	0.11 *** (0.01)
No Health Insurance (Baseline; 1=yes)	0.45 *** (0.12)	0.38 ** (0.12)	0.43 *** (0.12)	0.37 ** (0.13)	0.48 *** (0.12)	0.36 ** (0.13)
HS (ref: LTHS)	-0.58 *** (0.08)	-0.40 *** (0.10)	-0.44 *** (0.09)	-0.52 *** (0.08)	-0.37 *** (0.09)	-0.18 ⁺ (0.10)
Some College (ref: LTHS)	-0.71 *** (0.10)	-0.46 *** (0.10)	-0.56 *** (0.10)	-0.57 *** (0.10)	-0.47 *** (0.10)	-0.22 * (0.11)
College ⁺ (ref: LTHS)	-1.18 *** (0.14)	-0.78 *** (0.15)	-0.96 *** (0.14)	-0.98 *** (0.13)	-0.82 *** (0.15)	-0.37 * (0.16)
Current Smoker (ref: Non-Smoker)		1.00 *** (0.08)				0.92 *** (0.09)
Non-Drinker (ref: Moderate Drinker)		0.51 *** (0.10)				0.34 *** (0.09)
Heavy-Drinker (ref: Moderate Drinker)		0.51 ** (0.17)				0.52 ** (0.19)
Psychological Distress (Range 0–8)			0.14 *** (0.01)			0.03 ⁺ (0.02)
Divorced (ref: Married)				0.35 *** (0.10)		0.16 ⁺ (0.09)
Separated (ref: Married)				0.24 * (0.12)		0.17 (0.12)
Never Married (ref: Married)				0.40 (0.39)		0.07 (0.43)

Household Income (log)				-0.12 ^{***} (0.02)		-0.07 ^{**} (0.02)
BMI					0.00 (0.01)	0.01 [*] (0.01)
Chronic Conditions (Range 0-9)					0.38 ^{***} (0.02)	0.29 ^{***} (0.03)
Constant	-5.05 ^{***} (0.11)	-6.07 ^{***} (0.16)	-5.52 ^{***} (0.13)	-4.39 ^{***} (0.18)	-5.86 ^{***} (0.24)	-6.73 ^{***} (0.34)
Panel D: White Fathers						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Child Loss by Midlife	0.03 (0.15)	0.05 (0.14)	-0.08 (0.16)	-0.01 (0.15)	-0.06 (0.15)	-0.12 (0.16)
Foreign-Born (1=yes)	-0.31 (0.20)	-0.32 (0.20)	-0.23 (0.19)	-0.26 (0.20)	-0.21 (0.19)	-0.19 (0.19)
Born in South (1=yes)	0.15 ⁺ (0.08)	0.12 (0.08)	0.05 (0.08)	0.14 ⁺ (0.08)	0.09 (0.08)	0.01 (0.08)
# Losses by Midlife	0.09 ⁺ (0.05)	0.09 ⁺ (0.05)	0.09 ⁺ (0.05)	0.07 (0.05)	0.05 (0.05)	0.05 (0.05)
Age (centered at 50)	0.10 ^{***} (0.01)	0.11 ^{***} (0.01)	0.11 ^{***} (0.01)	0.10 ^{***} (0.01)	0.10 ^{***} (0.01)	0.12 ^{***} (0.01)
No Health Insurance (Baseline; 1=yes)	0.40 ^{***} (0.11)	0.27 [*] (0.11)	0.27 [*] (0.12)	0.34 ^{**} (0.11)	0.42 ^{***} (0.11)	0.19 (0.13)
HS (ref: LTHS)	-0.41 ^{***} (0.08)	-0.30 ^{**} (0.09)	-0.39 ^{***} (0.09)	-0.40 ^{***} (0.08)	-0.36 ^{***} (0.08)	-0.31 ^{***} (0.09)
Some College (ref: LTHS)	-0.31 ^{**} (0.10)	-0.17 (0.11)	-0.21 ⁺ (0.11)	-0.22 [*] (0.10)	-0.27 ^{**} (0.10)	-0.09 (0.11)
College ⁺ (ref: LTHS)	-0.99 ^{***} (0.13)	-0.70 ^{***} (0.14)	-0.88 ^{***} (0.14)	-0.83 ^{***} (0.12)	-0.80 ^{***} (0.12)	-0.47 ^{***} (0.13)
Current Smoker (ref: Non-Smoker)		0.83 ^{***} (0.06)				0.81 ^{***} (0.07)
Non-Drinker (ref: Moderate Drinker)		0.39 ^{***} (0.07)				0.25 ^{**} (0.08)
Heavy-Drinker (ref: Moderate Drinker)		0.29 ^{**} (0.10)				0.25 [*] (0.09)
Psychological Distress (Range 0-8)			0.16 ^{***} (0.02)			0.07 ^{**} (0.02)
Divorced (ref: Married)				0.47 ^{***} (0.10)		0.23 [*] (0.10)
Separated (ref: Married)				0.05 (0.26)		-0.21 (0.31)
Never Married (ref: Married)				-0.28 (0.62)		-0.13 (0.65)
Household Income (log)				-0.09 ^{***} (0.01)		-0.05 ^{**} (0.02)
BMI					-0.01 (0.01)	0.01 ⁺ (0.01)
Chronic Conditions (Range 0-9)					0.37 ^{***} (0.03)	0.30 ^{***} (0.03)
Constant	-4.71 ^{***} (0.14)	-5.49 ^{***} (0.17)	-5.12 ^{***} (0.15)	-4.20 ^{***} (0.17)	-5.08 ^{***} (0.26)	-6.09 ^{***} (0.30)

Note. Standard errors in parentheses;

*** p<0.001,

** p<0.01,

* p<0.05,

⁺ p<0.10