DO RACIST ATTITUDES HARM THE COMMUNITY HEALTH INCLUDING BOTH THE VICTIMS AND PERPETRATORS? – MULTILEVEL SURVIVAL ANALYSIS

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Introduction

Harmful effects of racial prejudice on blacks

Racism appears to be one of the major risk factors for physical and mental health of blacks, reducing one's life expectancy to a greater extent than obesity.[1-4] The mechanism through which racism influences health can be explained through multilevel pathways: internalized, interpersonal and structural process.[5] Three types of processes tend to be closely intertwined with each other.

Internalized racial prejudice (e.g., a low sense of intrinsic worth) developed in response to repeated interpersonal experiences of racial disadvantage and unfair treatment from public institutions might be a severe stress for minority individuals. Stressful events across life course extract a physiological toll on various body functions.[6-7] Depression, cynicism and hostility embedded in internalized racial prejudice may increase interpersonal conflicts and contribute to higher rates of homicide and suicide among blacks.[8]

One study found that black women who feel that they are victims of racial maltreatment tend to have poorer birth outcomes than other black women delivering at the same hospital.[1,7] Blacks who feel that they have been victimized show higher rates of hypertension than similar people who do not feel that they are victims of discrimination.[1,7] Some empirical studies also addressed that racial prejudice is related to higher health risk behaviors such as consumption of alcohol as well as higher abdominal obesity rate.[9] Institutionalized racism can also harm general well-being of minority people with the connivance of structural context in a community. For example, when the majority of voters attribute the disadvantage of minority to their own laziness and unintelligence, policies are less likely to be favorable to advocating the rights of minority groups. Institutionalized racism can cause underdevelopment of minority residential areas and restrict the access to high

quality of public facilities and health care services.[10] There is some evidence that racially residential segregation is positively related with high concentration of alcohol and drug use with easier access to liquor stores and higher density of alcohol/tobacco advertisement .[11]

Harmful effects of racial prejudice on whites

Intriguingly, some studies argue that racism may also affect the health of those who express racist feelings. For instance, Kennedy et al found that higher levels of collective racial prejudice were associated with higher rates of mortality among blacks and whites alike.[12] However, this study lacks individual-level data which eliminates any ability to connect racism to individuals' mortality as well as to their socio-demographic, and behavioral factors. As far as we know, there is no study that systematically examines the effects and mechanisms of racial prejudice on the health of whites in the U.S.

There are feasible multilevel mechanisms through which racial prejudice might influence the health outcomes of whites. The psychoanalytic literature argues that racial intolerance is originated from self-anxiety that whites' social superiority might be threatened by the out-group members.[13] Anxiety, such as that plausibly expressed as a form of anger or hostility against minority groups, is associated with stress hormone cortisol and hypertension which can cause various health problems of perpetrators in the long term.[13-15] It can be thought that psychological distress and anxiety increase alcohol and tobacco use.

The harmful effects of racial prejudice on the perpetrator can be extended to a macro level through interpersonal interactions. According to Christakis, negative emotional states, such as stress, hostility or cynicism can spread along the social networks overtime and impact on health status of residents in the neighborhoods.[16] Based on his argument about the possible pathways through which negative emotion diffuses, we postulate that racial prejudice can be disseminated into the neighbors through an "induction", "homophily" and "confounding"

processes. First, people with racism infuse other people with racial prejudice through "induction." In this way, anxiety and stress embedded in racial prejudice may spread from person to person through social networking. Another pathway that we can consider is "homophily" whereby racially prejudiced people tend to build intimate relationship with people who have racial prejudice.[16] Social ties of high-racism people developed through the homophily process are likely to marginalize people who have different values from them and limit their access to resource and information in communities.[17] The socially marginalized people tend to have negative health outcomes. Strauss and Pollack analyze the 90,118 adolescents aged 13 to 18 in the U.S. and reveal a significant effect of social isolation on obesity along with lower self-esteem.[18] Social marginalization decreases social capital in neighborhoods and also may reduce altruistic support i.e. voluntary help in emergencies as well as informal social control to keep neighborhood safety and thus harm general well-being of the residents.[19]

Lastly, we can apply the concept of "confounding" to explain the impact of living in racially prejudiced society on individuals' health. Individuals share similar experiences, norm of behaviors as they exposure to the same social environment (confounding process).[16] For instance, it is possible that racist beliefs can spill over into other aspects of community political functioning, thus indirectly affecting the residents living in the community. For instance, if white voters harboring racist views convince their state legislators to cut spending on welfare or Medicaid (in the belief that they are punishing undeserving poor blacks living in their state), their actions may end up hurting poor white constituents and poor black constituents alike. Likewise politics against minority group people abets economic inequality between blacks and whites and contributes to decline in quality of life among white workers by lowering minimum income level and weakening social safety net in the long run. In

addition economic marginalization and social discrimination of specific areas with high concentration of blacks may exaggerate intergroup tension and result in violence and crime threatening the majority's health in near communities.

To our knowledge, no previous study has examined racial prejudice as a multilevel risk factor contributing to both majority and minority health status. We extend existing studies by investigating joint effects of individual and community level racial prejudice on mortality of blacks and whites in the U.S. For this purpose, we employ a multi-level discrete-time event history approach that includes mortality data for individuals who report their beliefs about race nested in the communities across the U.S. We also examine the interaction between race and community-level racial prejudice to test whether there is any difference in the effect of racial prejudice on mortality rate across racial groups. Subsequently we added interaction terms of individual-level racism and community-level risk factors to see if there is any modification in individual-level effect by community-level characteristics.[20] Through the secondary analysis with data separated by whites and blacks, we explore how the effect of collective racial prejudice varies by race beyond compositional effects.

Data

We use the cumulative 1985-2002 GSS survey linked prospectively to mortality data of the National Death Index available through 2008 (GSS-NDI).[21] The GSS-NDI data allows researchers to assess the impact of social determinant on mortality rate over time while eliminating recall bias in retrospective data. The data also provides information on primary sampling units (PSUs) established based on geographical residential space which make it possible to cluster participants in GSS interview. GSS-NDI data is most proper for studying the role of social environments shaping individuals' health outcomes with time. 23,847 people age over 18 nested in Primary Sampling Units (PSUs) participated in the GSS interview are

analyzed. 184 PSUs followed up between 1985 and 2002 are included in the final model. We also exclude the year of 1987 since in this year questions of our key variable of interest, racial prejudice were not asked.

We examine the timing of all cause mortality as an outcome and control for key socio-demographic, socio-economic characteristics and baseline health status. Socio-demographic and socioeconomic variables include race (white, black, other), sex (male, female), age at the time of interview (continuous variable), household income (<$20,000, $20,000-$45,000, >$45,000 per year), and educational attainment (less than high school, high school graduate, more than college). Household income is adjusted to constant 2002 dollars.[21]

We develop an individual-level racial prejudice scale by calculating individuals' scores over four questions encompassing two dimensions of racial prejudice, the negative societal beliefs and stereotypes about blacks. Responses to the four questions are averaged into a single continuous variable indicating whether an individual is high on one or all questions versus none of the questions. In addition, the total scores are dichotomized as low racial prejudice and high racial prejudice, using the median score as the cut point across individuals. The two dimensions encompass:

(1) attributions of causes of racial inequality ("Do you think racial differences in jobs, income, and housing are caused by the fact that most blacks/African-Americans have less in-born ability to learn?" and "Do you think blacks are in worse socio-economic situation because of the fact that most blacks just don't have the motivation or willpower to pull themselves up out of poverty?"). Each is coded as "yes (score 1)" or "no (score 0)"

(2) degrees of negative feeling against blacks compared with whites ("Whether people in the group of blacks (whites) tend to be hard-working or lazy" and "Whether people in the group of blacks (whites) tend to be intelligent or unintelligent"). Each response can be

selected on the 7-level Likert scales from ”lazy” to “hardworking” and from “unintelligent” to ”intelligent.” Ratings of whites are subtracted from the ratings of blacks to quantify unfavorable feelings against blacks compared with whites.

The reliability of the scale, calculated with the Cronbach’s alpha, is 0.68. When exploratory factor analysis is performed, the variables load strongly on each individual item, providing an added level of confidence in the scales’ reliability (>0.60). Multiple imputation method is used to handle missing data.

Community-level variables are measured based on the PSU of the GSS, which are composed of either metropolitan statistical areas, or rural counties. These PSUs serve as a proxy for the ‘life space’ including residential and working place.[23] From 1985 to 2002, the National Opinion Research Center conducted their interviews in the 184 PSUs across the US. To devise time series scales of community-level covariates, we average residents’ self-rated scores on racial prejudice within a PSU for each survey year. In this way we create additional covariates aggregated to the PSU level, viz.: proportion of African Americans living in a PSU, the proportion of people below federal poverty line adjusted for family size and survey year, and the proportion of people above the median on the total conservative political affiliation. Political affiliation is introduced into the model based on the assumption that political and racial cynicism might be highly correlated in the U.S. context. Conservatism is aggregated into a community level based on the question from the GSS: “Generally speaking, do you usually think of yourself as a Republican, Democrat, Independent, or what?”

Method

We combine discrete-time event history model with multilevel analysis to predict a differential in the likelihood of dying over age 18 between residents of the area with higher racial prejudice and with lower racial prejudice through the follow-up time. Statistical models

test the hypothesis that individuals' health risks (here: mortality rate) depend in part on the residential atmosphere to which he or she had exposed.

Before developing a multilevel construct, we expand individual-based data set into a time-based format, containing an each individual's records for each time unit.[24-25] Multilevel discrete-time event history analysis can fix possible errors from differential exposure to risk and censoring issue — the fact that some people's deaths are not observed because they survived the follow-up period.[26] In this study, people who were still alive at the end of the follow-up period are right censored. There is also a problem that people may move out and change their cluster membership after the interview. Discrete-time event history model makes this potential bias negligible by estimating hazard ratio based on the time units, not persons.[24]

A reason that we develop a three-level mixed method is to address temporal variance of our key variable, PSU-level racial prejudice. For example, the average score on racial prejudice has decreased from 0.41 in 1985-1990 to 0.33 in 1994 to 2002. In usual two-level multilevel analysis, contextual level covariates are assumed to be time invariant. In contrast to such design, the data we use came from repeated cross-sectional survey with contextual covariates changing their values over time. Therefore, we need to consider two components of information conveyed by time series of contextual characteristics simultaneously: information on the variance across communities and variance within a community changing over time. [24-25] Given this ecological dynamics, random intercept at context-level is no longer a definite value but a changing value and random disturbance at neighborhood-level are not independent from the covariates (observations). This results biased estimates of standard errors. Therefore, we construct a three-level multilevel structure including context-level time invariant intercept at level 3, context-level time variant characteristics at level 2, and individual-level covariates at level 1 instead of two-level multilevel model. The 3- and 2-

level variances in mortality rate are calculated from an equation with separate random effects where PSUs are the units of analysis and the units of repeated measurement for each year (Fig.1). Models are fit using the HLM program with restricted maximum likelihood approximation.[27]

In model 1, we add estimators of baseline hazard and all the individual predictors in the fixed part of the model. Respondents' socio-demographic variables (age at the time of interview, sex, and race) and socio-economic indicators (household income and educational attainment) are included. The equation in Model 1 with individual-level covariates has the following form (where we show just the fixed parameter for race as one example):

$$\text{logit}(p_{ti}) = \ln \frac{p_{ti}}{(1-p_{ti})} = \alpha_t + \beta_0 + \beta_1 x_{1j} + e_i \qquad (1)$$

In this example, logit(p_{ti}) is the conditional probability that individual *i* dies at year *t*, conditional on a fixed part $\alpha_t + ß_0 + ß_1$ and a random part e_t. The parameter α_t estimates the baseline hazard function of mortality and is composed of counter variables of the number of years after interview and the square term of the number of years after interview. The parameter $ß_1$ estimates the differential in the mortality hazard for covariate, x_{1j} (blacks). The parameter, e_i, represents the residual term at level 1 that is assumed to have an independent and identical distribution from zero to component variance : $e_i \sim N(0, \sigma_e^2)$. The random parameter, σ_e^2, is the unobserved heterogeneity in the outcome, *conditional* on the relationship between the log odds of mortality and the individual predictor(s) (here: race). In model 2, we additionally introduce the individual-level racial prejudice into the model to test its impact on mortality risk after controlling for individual-level fixed effects.

The model above is then extended in subsequent models to include the time variant PSU-level predictors of interest (*e.g.* collective racial prejudice) at level 2 and then time-invariant PSU-specific intercept at level 3 in order to evaluate the extent to which the variation in mortality risk is correlated with PSU-level characteristics (Model 3). Thus, for instance, $\overline{X}_{1j}$ that is, the level of collective racial prejudice in PSU *j* in year t, and β^{p}, addressing the effects of collective racial prejudice, are introduced to account for the observed variation in mortality risk. In this model we can compare the relative impact of individual racial prejudice to PSU-level racism on mortality risk. Individual racial prejudice $x_{tijk} - \overline{X}_{jk}$ is orthogonal to its PSU mean value in order to overcome potential collinearity caused by variable aggregation.[28]

$$\begin{aligned} \text{logit}\,(p_{tijk}) &= \ln \frac{p_{tijk}}{(1-p_{tijk})} \\ &= \alpha_t + \beta_{000} + \beta(x_{tijk} - \overline{X}_{jk}) + \beta^{p}{}_1 \overline{X}_{1tk} + e_{ijk} + u_{jk} + v_k \end{aligned} \qquad (2)$$

The parameter of interest in this model would be the estimate of the change in the response probability for a change in time-variant PSU-level racial prejudice *conditional* upon the individual-level predictor(s), $x_{1t\mathbf{jk}}$. If there is statistically significant support for an association between contextual racial prejudice and the death hazard of individual *i* in year *t*, then we expect the variance, σ^2_{u0} associated with the level 2 specific differentials (u_{jk}) to be reduced towards zero. Random effect at level three ($v_{k,}$ time-invariant PSU-level random effect) is introduced and assumed to follow a normal distribution.

Model 4 includes the simultaneous effects of PSU-level racism, the percentage of poverty, black residents, and people who self identify them as a conservative on mortality rate. Model 5 considers cross-level interactions between individual-level and PSU-level

characteristics. We add a term for race by contextual racial prejudice interaction to assess whether the relation of contextual racial prejudice to mortality differed for blacks and whites. We develop another set of interaction models to assess the extent to which the contextual effects of poverty, percent of black residents, conservatives and racial attitudes on individuals' probability of death differ for less and more racially prejudiced individuals. Finally, to control the possibility that healthy people choose certain place to live, baseline health condition is introduced.

Subsequently, we design an analysis stratified by race to examine how collective racial prejudice is associated with mortality rates of the whites and blacks respectively beyond individual- and contextual-covariates.

Results

Table 1 lists the basic demographic characteristics of the subjects (n= 23,847) from the analytic sample. Approximately 23.2 % of the overall GSS/NDI respondents died between 1985 and 2002. The mean age of the cohort is 44, and the range is 18-89 years. About 43.6 % of respondents are male and 56.4 % are female, and 82.1% are white and 13.0% are black.

Table 2 presents the odds ratio estimates and confidence intervals from the multilevel discrete-time event history models. Model 1 is designed to test the basic individual-level associations between socio-demographic characteristics and mortality hazard rates. The effect of time is modeled as a negative quadratic function and this might be explained by the selection effect of population. We show that higher mortality in the GSS-NDI linked cohort is associated with the predictable individual covariates, including male, higher age at the baseline, black, and lower SES. For instance, black individuals experience roughly 30% higher rates of mortality during the follow up years compared with whites (OR=1.30, 95% CI=1.17 to 1.45), as do those with the lowest level of educational attainment

(less than high school) compared to college and above (OR=1.27, 95% CI = 1.13 to 1.42) and those earning less than $20,000 relative to those earning more than $45,000 (OR=1.36, 95% CI= 1.24 to 1.51). When individual-level racial prejudice is added to model 1, we can see that people having higher racist perception have lower survival rates than do those who having lower racial prejudice after controlling for other individual characteristics (OR=1.09, 95% CI= 1.01 to 1.18). Effect of racial prejudice on mortality hazard ratio does not differ by racial groups (the result of interaction is not included in the final model).

We find an independent effect of community-level racial prejudice on the risk of mortality. Living in a high-racist community increases the odds of death by 39% (OR =1.39, 95% CI = 1.03 to 1.87). The coefficients of individual-level covariates are similar to the results in previous model except for individual-level racial prejudice. Individual-level racial prejudice is no longer significantly related with the odds of death after adjusting for community-level racial prejudice. When community-level poverty, percent black residents, conservative residents and community-level racial prejudice are simultaneously controlled for (model 4), community-level racial prejudice is remained associated with a statistically significant excess odds of mortality (OR= 1.41, 95% CI = 1.05 to 1.91). Mortality increases in communities where the percentage of blacks is higher and the relationship is marginally significant (OR=1.03, 95% CI =1.00 to 1.06). Living in high poverty areas is positively associated with mortality rates with only marginal significance (OR=1.03, 95% CI =1.00 to 1.06). We can find that the contextual conservatism is negatively associated with mortality rates even though it is not statistically significant.

In model 5, we examine the cross-level interactions between context- and individual-level effects. When the interaction between race and collective racism is added, the term for the interaction is not significant. This means that the relation between collective racial

prejudice and mortality rates do not differ significantly between blacks and whites. We assess whether there is an effect modification of individual-level racism by community-level factors. A statistically significant interaction effect is found between individual which high racial prejudice (above median score on the racial prejudice index) and community-level racial prejudice (OR=0.01, 95% CI = 0.05 to 0.19). This result can be interpreted that low-racism individuals living in high-racism neighborhoods are likely to have higher mortality rates. On the other hand, high-racism community appears to protect people with high racial prejudice to a certain degree from the harmful effect of living with racial prejudice.

The impact of collective level prejudice on mortality risk is persistent even after controlling for initial health condition (OR=1.62, 95% CI = 1.11 to 2.38). This indicates that our result about the independent effect of collective racial prejudice on mortality risk is very robust.

When we separately estimate the same model for the samples of whites and blacks, we can observe a positive association between racial prejudice and mortality for both groups. For whites, collective level racial prejudice increases the odds of death by 38% after controlling for individual- and PSU-level covariates (OR=1.38, 95% CI =1.004 to 1.90). For blacks, both individual- and context-level internalized racial prejudice are related with higher mortality rate. Yet this association becomes statistically insignificant when we control for educational attainment.

Discussion

We find that individuals who were exposed to a racist atmosphere tend to have higher mortality rate. The study presented here has extended previous work on the racism and health by assessing the effect of racial prejudice on mortality rates across blacks and whites. We utilize a methodology of multilevel discrete-time event history model for two reasons: 1) to

estimate the impact of individual- and context-level racial prejudice on the mortality risk simultaneously, 2) to consider temporal variance of the context-level measurements and reduce bias caused by residential mobility both of which have been challenges of traditional multilevel analysis. The major results of this study suggest three main findings: 1) community-level racial prejudice appears to be an independent influence on all cause mortality, beyond individual socio-demographic characteristics, initial health condition, and individually-held racist beliefs, 2) living in highly prejudiced society is harmful for both blacks and whites, 3) there is a significant interaction effect between individual racial prejudice and collective racial prejudice. Individuals whose social values i.e. racial prejudice, are congruent with those of their communities have a lower risk of mortality than those who live in the neighborhoods with incongruent social norms (See Figure 2). Likewise, significantly higher mortality rates are reported by both low-racism whites and blacks who live in neighborhoods with a high concentration of racists.

The results of secondary analysis indicate that for whites, the negative effect of community-level racism is significant even after adjusting for individual- and community-level covariates. For blacks, the effect of community-level racism is harmful but becomes insignificant after controlling for individual-level educational attainment. This result suggests that education is a confounder of the relationship between internalized racial prejudice and mortality risk of blacks. Education appears to play a crucial role in alleviating harmful effects of racial prejudice especially for black people.

There are several possible mechanisms through which individual racial prejudice and the mortality relationship vary by the level of community-level racial prejudice. This result, along with the previous studies, indicates people may experience harmful physical and emotional events when their norms and values disaccord with those of community majority

as majority groups marginalize people whose values do not conform to collective norms.[29]

Social values shared by a community can spread out through the social network and influence an individual life in direct or indirect ways. Through social connections majority people who have high-racism often tend to seek the concurrence of neighbors in their racial privilege so that they can solidify mutual reciprocity and reduce the stress from white guilt.[30] This might be a reason why protective effect is observed in collective racial prejudice for people with high racism.

When it comes to minority people with low internalized racial prejudice (high-self esteem) who live in a racist society, they might perceive injustice in their environment more frequently than others. Perceived injustice contributes to disadvantaged mental health outcomes such as maladaptive anger or post-traumatic stress reaction.[5,31] It is also plausible that the area with higher concentration of racially prejudiced individuals is not likely to adopt policies and laws favorable to minorities. Institutionalized racism might give rise to collective anger and hostility which foster crime and violence within a neighborhood.[5,31] And this can increase mortality risks caused by external injuries or homicide for both blacks and whites living in that area. Our findings emphasize that the value structure of neighborhoods could shape and modify individual health outcomes beyond individual-level characteristics.

Limitations and Implications

Several cautions are warranted in interpreting our findings. First, the present study's racism scale may not have captured all the relevant dimensions of racism, conceived of here as racial prejudice. It is difficult to measure racial attitudes because of social desirability bias (i.e. those who hold racial stereotypes are reluctant to disclose them for fear of being labeled a racist). To the extent that social desirability is more pronounced among more educated

individuals (who also experience a lower risk of mortality), this measurement bias may have led to an exaggeration of the association between racist attitudes and mortality.

Since we use repeated cross sectional data, we could not control for the potential reverse causality in the relationship between racial prejudice and mortality outcome. Higher mortality rates might increase racial prejudice at both individual- and context-level. The relationship between community-level racial prejudice and population mortality could be confounded by unmeasured covariates, such as social capital, racial segregation or income/educational inequality.[32] The omitted-variables can cause selection effects while restricting ability to estimate true neighborhood effect on the outcome variable. Even though we control for individual- and community-level characteristics including health baseline to reduce selection bias, we should search for the possible mediators of the relationship between racial stereotype and mortality in the future study.

While racism unquestionably harms the health of victims, the findings also suggest that it impacts the health of those who hold racist beliefs, and extends to the broader communities within which they live as a multilevel risk factor. Community-level norms and values represented as collective racial prejudice modify the individual-level effects of racial prejudice on all-cause mortality. These findings require more systematic consideration in future research of racism effects on various causes of mortality. An examination of how far racial prejudice vary across social settings and across different causes of death, such as chronic disease, suicide, and external injury, is important for enhancing our understanding of the specific pathways, through which social stereotype influence health outcomes.

A broad array of social policies dating back to the Civil Rights era has been introduced within the United States to combat the corrosive effects of collective racism. While these policies (e.g. school desegregation, legislation to counteract employment

discrimination) have contributed to the mitigation of the consequences of racism, combating the persistence of racist attitudes (i.e. what people think or believe about other groups) remains a daunting challenge.[33]

The current research suggests that developing macro-level intervention programs that address collective racial prejudice can be a good approach for enhancing public health. Clearly, changing societal attitudes requires new and innovative approaches. For instance, public communications campaigns, such as the Superman comic strips that marginalized the Klu Klux Klan in the 1940s, helped to fight against public racist perceptions.[34] Collective prejudice towards blacks in the U.S. also stems in part from historically discriminatory policies that have created segregated pockets of black socioeconomic disadvantage across the U.S.[35] Social policies that try to reduce this unfair maltreatment and black-white educational, economic disparities will improve public attitudes toward blacks. Based on our result, we suggest that eliminating racial discrimination and racial stereotypes which can be defined at multi-level contributes to healthy life of both blacks and whites.[36]

Table 1. Demographic characteristics of respondents in the 1985-2002 General Social Survey-National Death Index data.

Characteristics	N (%)
Level-1, individuals, n=23,847	
Mortality	
Dead	5,525 (23.2%)
Alive	18,322 (76.8%)
Age	
18-24	2,269 (9.5%)
25-44	10,653 (44.7%)
45-64	6,600 (27.7%)
65-89	4,296 (18.0%)
Sex	
Male	10,398(43.6%)
Female	13,449 (56.4%)
Race/ethnicity	
White	19,584 (82.1%)
Black	3,110 (13.0%)
Other	1,153 (4.8%)
Educational attainment	
≤ High school	4,444 (18.7%)
High school	12,673 (53.3%)
≥ High school	6,659 (28.0%)
Annual household income	
<$20,000	5,797 (27.1%)
Between $20,000-$45,000	6,601 (30.8%)
>45,000	9,003 (42.1%)
Health	
Excellent	5,401(31.3%)
Good	8,002(46.4%)
Fair	2,953(17.1%)
Poor	875(5.1%)
Racial attitudes	
High Racism	8,782 (51.4%)
Low Racism	8,298 (48.6%)
Level 2, Primary Sampling Units, n=184	Mean (Range)
PSU-level Racism Index	0.36 (0-1)
Percent below the federal poverty level	13.8 (0-100)

Percent black	13.0 (0-100)
PSU-level Conservatism Index	2.80 (.59-5)

Table 2. Multilevel discrete-time event history models predicting odds of all-cause mortality by individual and community (PSU)-level characteristics

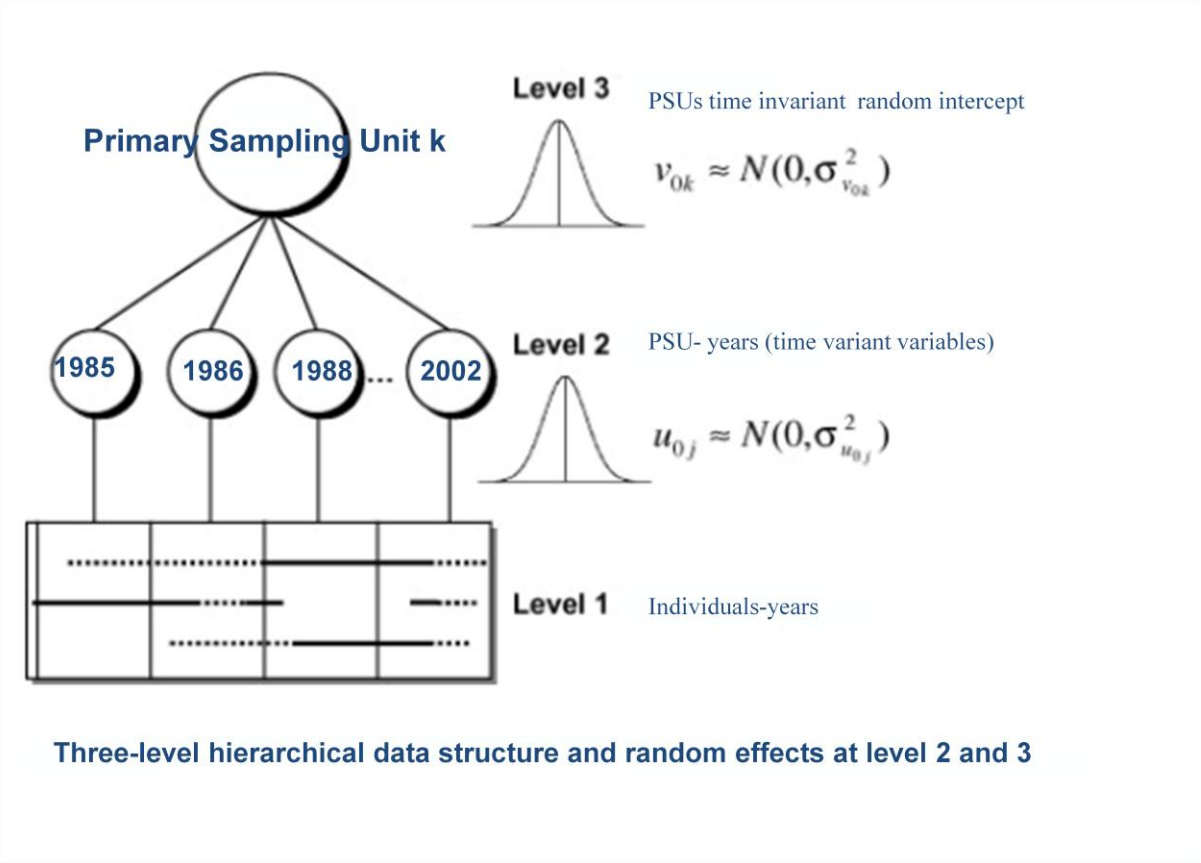
Fixed parameters	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	0.001(0.00,0.00)	0.001(0.00,0.00)	0.000 (0.00,0.00)	0.001(0.00,0.00)	0.001(0.00,0.00)	0.001(0.00,0.00)
Individual Characteristics						
Age at the time of interview	1.055(1.05,1.06)	1.055(1.05,1.06)	1.055(1.05,1.06)	1.056(1.05,1.06)	1.056(1.05,1.06)	1.054(1.05,1.06)
Gender						
Male	Reference	Reference	Reference	Reference	Reference	Reference
Female	0.722(0.67,0.78)	0.722(0.67,0.78)	0.722(0.55,0.78)	0.720(0.67, 0.77)	0.718(0.67, 0.77)	0.746(0.68, 0.82)
Race						
White	Reference	Reference	Reference	Reference	Reference	Reference
Black	1.301(1.17,1.45)	1.333(1.19,1.49)	1.321(1.18,1.48)	1.310(1.16,1.48)	1.295(1.15,1.46)	1.244(1.06,1.45)
Other	0.978(0.79,1.21)	0.976(0.79,1.21)	0.978(0.79,1.21)	0.975(0.78,1.21)	0.977(0.79,1.21)	0.877(0.67,1.15)
Educational attainment						
≤ High school	1.268 (1.13,1.42)	1.243(1.11,1.40)	1.246(1.11,1.40)	1.241(1.11,1.40)	1.247(1.11,1.40)	1.171(1.01,1.36)
High school	1.141(1.04,1.25)	1.124(1.02,1.24)	1.128(1.03,1.24)	1.127(1.02,1.24)	1.127(1.03,1.24)	1.070(0.95,1.21)
≥ High school	Reference	Reference	Reference	Reference	Reference	Reference
Annual household income						
Less than $20,000	1.364(1.24,1.51)	1.365(1.24,1.51)	1.366(1.24,1.51)	1.404(1.27,1.56)	1.412(1.28,1.56)	1.242(1.09,1.42)
$20,000-$45,000	1.203(1.10,1.32)	1.201(1.10,1.32)	1.201(1.10,1.32)	1.210(1.10,1.33)	1.217(1.12,1.33)	1.174(1.05,1.32)
More than $45000	Reference	Reference	Reference	Reference	Reference	Reference
High racism*		1.092(1.01,1.18)	1.037(0.96,1.12)	1.036(0.96,1.12)	1.980(1.30,3.01)	1.000(0.89,1.10)
Baseline Health Status						1.250(1.18,1.32)
Neighborhood(PSU-Level) Characteristics						
PSU-level Racism Index			1.389(1.03,1.87)	1.412(1.05,1.91)	1.581(1.18,2.12)	1.622(1.11,2.38)
Proportion of people in poverty				1.031(1.00,1.07)	1.026(0.99,1.06)	1.022(0.98,1.07)

Proportion of blacks	1.027(1.00,1.06)	1.027(1.00,1.05)	1.042(1.01,1.08)
PSU-level Conservatism Index	0.982(0.93,1.04)	0.979 (0.92,1.04)	0.987 (0.92,1.07)
PSU/Individual interaction			
PSU racism*High racism		0.099(0.05,0.19)	
Proportion blacks people*High racism		0.998(0.95,1.05)	
Proportion in poverty*High racism		1.038(0.98,1.10)	
PSU conservatism* High racism		1.038(0.93,1.16)	

Table 3. Estimated odds ratios for the effect of PSU-level racial prejudice (and 95% confidence intervals) on all cause mortality for Non-Hispanic Whites and Non-Hispanic Blacks, 1985 – 2002.

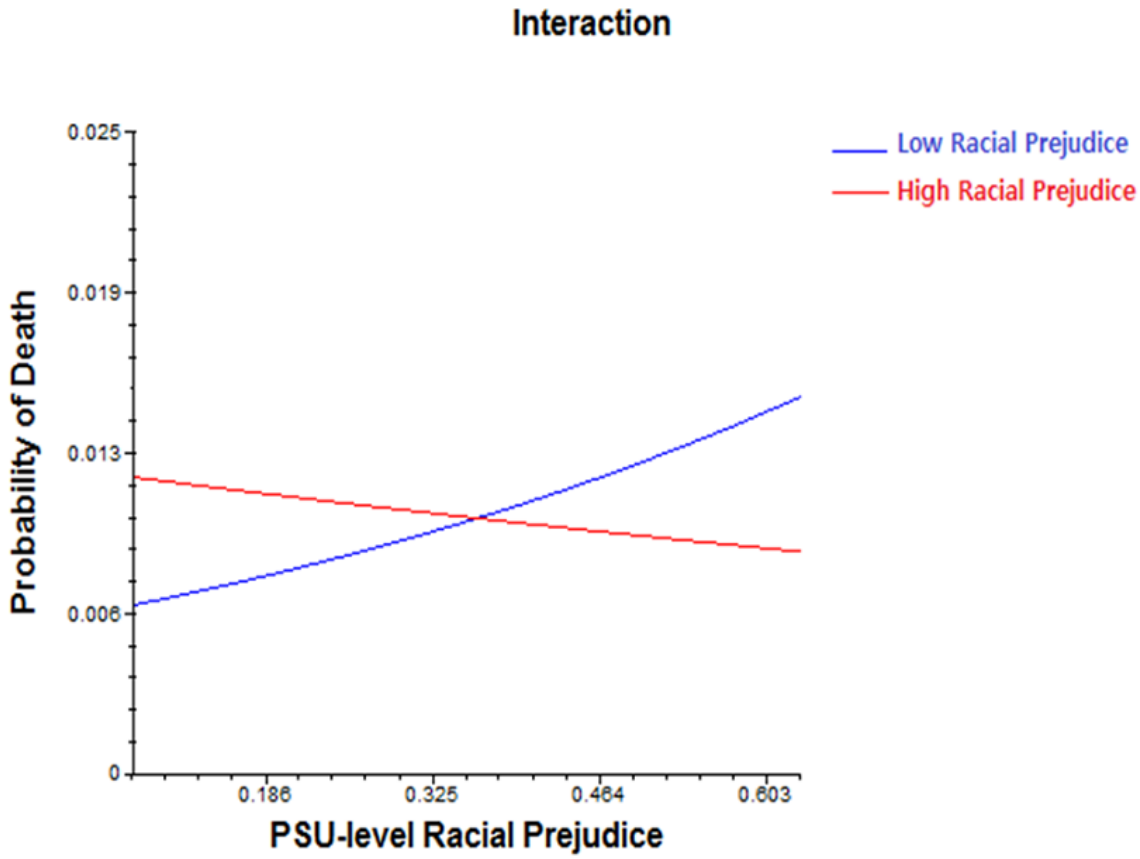
Non-Hispanic Whites			Non-Hispanic Blacks		
Adjusted for the age of interview & Baseline hazard	Adjusted for Individual-level SES & PSU-level characteristics	Adjusted for Individual-level SES & PSU-level characteristics & Baseline health status	Adjusted for the age of interview & Baseline hazard	Adjusted for Individual-level SES & PSU-level characteristics	Adjusted for Individual-level SES & PSU-level characteristics & Baseline health status
1.527 [1.127 - 2.067]	1.379 [1.004 - 1.896]	1.607 [1.084 - 2.382]	2.718 [1.314 - 5.624]	2.026 [0.953 - 4.309]	1.427 [0.342 - 5.960]

Figure 1.



Source: Windzio, M.(2008) Organizational ecology of immigrant employment and organizational buffer zones: Who leaves firs when the organization gets into trouble?[37]

Figure 2.


Interaction
Low Racial Prejudice
High Racial Prejudice
Probability of Death
0.025
0.019
0.013
0.006
0
0.186
0.325
0.464
0.603
PSU-level Racial Prejudice

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