Interracial Marriage and Mortality: Evidence from the United States, 1986-2004[1]

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Abstract

A large body of sociological and demographic research has noted the salient relationship between marital status and mortality: Married people enjoy longer life expectancy than the unmarried. However, the extant literature has paid little attention to the heterogeneity within the married population. Little research has examined the potential health consequences of interracial marriages. In light of persistent stigma and discrimination against interracial marriages, as well as the high dissolution rates of interracial marriages, our study examines the relationship between interracial marriage and individuals' mortality risk among Blacks and Whites. We hypothesize that the interracially married suffer higher mortality risk than those in same-race marriage. We also examine gender as a potential moderator of the interracial marriage effect. Pooled Data from 1986 to 2004 from the Integrated Health Interview Series (IHIS) are used for our analysis. Cox regression results show that interracial marriage is significantly associated with higher mortality risk than same-race marriages, after controlling for socio-demographic covariates. However, there is no significant gender difference in interracial marriage effect.

Keywords: Mortality, Marital Status, Interracial Marriage

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INTRODUCTION

A large body of sociological and demographic research has noted the salient relationship between marital status, and individual health outcomes, suggesting that marriage renders individuals various health benefits such as better overall health, less depression, and ultimately longer life expectancy (Hemström 1996; Lillard & Panis 1996; Lillard & Waite 1995; Liu 2009; Liu & Umberson 2008; Waite 1995). However, the extant literature has paid little attention to the heterogeneity within the married population. On the other hand, earlier works and recent studies all suggested that marriage across racio-ethnic boundaries has undergone higher social strains, and received less social support from friends and family members (Bratter & Eschbach 2006). In addition, studies also indicate that interracial couples are more likely to have unstable marriages (Bratter & King 2008; Zhang & Hook 2009), and as revealed by a number of research, marital disruption causes people detrimental health consequences, both psychologically and physically (Lillard & Waite 1995; Liu 2009; Liu & Umberson 2008; Wade & Pevalin 2004).

Despite the considerable evidence that people marrying across color lines receive greater social pressure, and are prone to marital instability, which brings about health disadvantages, little research has examined the relationship between racio-ethnic composition of marriage and individuals' health. Among the few that focused on interracial couples, most were based on clinical or convenient samples. Only one study, to our current knowledge, employed a population-based sample to explore the association between racially exogamous marriage and psychological distress (Bratter & Eschbach 2006). Therefore, this research aims to address such a research gap by exploring the relationship of interracial marriage and individuals' mortality risk. Particularly, in view of the conventionally stronger negative attitudes held against unions between African Americans and Whites, this paper place its focus on Black-White intermarriage, and compare the mortality risk of people in Black-White marriage to that of their same-race counterparts.

THEORETICAL AND EMPIRICAL BACKGROUNDS

To explore the relationship of interracial marriage and mortality, one might start by asking "how could mixed-race marriage be associated with one's mortality risk?". This section devotes itself to laying the foundations of this question, and demonstrates how the existing theoretical formulations and related empirical findings illuminate the current inquiries into the association of interracial marriage and self-rated health.

Despite its increasing numbers[1], as termed by Rosenfeld (2007) as "nontraditional" or

[1] According to previous research, the percentage of interracial marriage rose from 0.7% in 1970, to 1.3% in 1980, and to 2.2% in 1992 (Qian 1997). A more recent analysis also indicated that the number of interracial

"transgressive" unions, interracial marriage still constitutes a minority population in American society. As indicated, endogamy still has been a hidden norm, and marrying across color lines still violates the enduring norms of who should and should not marry whom (Bratter & King 2008; Kalmijn 1998). As a result, interracial couples, who marry against the norm, tend to be exposed to greater social strains derived from prejudice and discrimination, and such pressure could themselves be a source of one's health disadvantage. In addition to this greater societal atmosphere of discrimination, we suggest two possible mechanisms through which interracial marriage might be associated with worse health: marital instability, and less social support.

Interracial Marriage and Marital Instability

Several theoretical models postulate the relationship between interracial marriage and marital dissolution. The homogamy perspective posits that couples with similar characteristics have fewer misunderstanding, less conflict and enjoy greater support from extended family and friends. Put in the context of race/ethnicity, as interracial couples often face social pressure from strangers perceiving them as "deviant" and rejection by their own racial groups as betrayal, interracial marriage tends to be less stable than racial endogamous marriage. On the contrary, the ethnic divorce convergence perspective theorizes that the divorce risk of interracial couples is likely to fall between the divorce patterns of the involved racial groups, reflecting the interplay of the divorce cultures of the racial/ethnic groups involved (Jones 1994, 1996; Zhang & Hook 2009). An alternative framework draws on the selection logic, contending that interracial marriage selects on persons mostly likely to divorce (Bratter & King 2008). Research findings indicate that in contrast to the prediction of the ethnic convergence hypothesis, interracial marriages tend to be less stable, and thus are more vulnerable to marital dissolution (Bratter & King 2008; Zhang & Hook 2009). A number of studies suggest that marital dissolution has detrimental effects on individuals' health and mortality risk (Lillard & Waite 1995; Liu 2009; Liu & Umberson 2008; Wade & Pevalin 2004). In light of racially exogamous marriage's higher vulnerability to marital dissolution, and the detrimental effects on one's health thereof, it is warranted to suspect that interracial marriage could be associated with higher mortality risk.

Interracial Marriage and Social Support

As early as in 19th century, Durkheim asserted the importance of solidarity in providing individuals with a sense of belonging, and thus protecting people from committing suicide (1897). Contemporary research reveals that social support, in general, also confers advantage to individuals' health (Lin, Ye & Ensel 1999; Seeman, Seeman & Sayles 1985). Marital

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marriage has more than doubled from 651,000 in 1980 to 1.6 million in 2002 (Bratter & Zuberi 2008)

resource model also posits that increased social support is an important mechanism through which marriage benefits people's health (Liu 2009). It has become a well-known fact that social support contributes to one's health conditions. Unfortunately, it has been pointed out that a great deal of interracial couples still experience disapproving reactions from family, friends and acquaintances, and such disapproval from intimate social groups, and reduced social support may be sources of stress that detrimentally affect mixed-race couples (Bratter & Escbach 2006). Considering the importance of social support for individuals' health, and interracial couples' lack thereof, it is reasonable to hypothesize the association of interracial marriage and higher mortality risk.

Some Empirical Evidence

Despite substantial theoretical formulations and empirical studies arguing for possible mechanisms through which interracial marriage could be associated with health disadvantage, there has been a serious paucity in studies that directly address the health consequences of mix-raced marriage. One of the very few was done by Bratter & Eschbach (2006), who examined the association between interracial marriage and psychological distress using a national representative sample. Their study found that Native American men, White women, and Hispanic men and women married to non-White spouses are more likely to be inflicted with psychological distress in comparison to endogamous members of their same racial/ethnic groups. Their findings have provided empirical support for the current study, as psychological distress is related to one's mortality risk.

RESEARCH QUESTIONS AND HYPOTHESES

The discussions in the preceding section constitute the theoretical and empirical foundation of this study. Previous research suggests that interracial couples undergo greater social pressure for breaking marital norms, and receive less social support. Marriage across racio-ethnic boundaries has a higher propensity of marital disruption. Empirical evidence also indicates that mix-raced couples are more vulnerable to psychological distress. Drawing upon this existing literature, the current study intends to explore whether differentials in mortality risk exist between the interracially married and their racially endogamous counterparts. As informed by the long history of slavery, the existing racial discrimination against the Black, and by former studies suggesting that African Americans are least likely to marry non-Hispanic Whites (Bratter & Zuberi 2001; Qian 1997; Qian & Litcher 2007), this paper place its focus on Black-White marriage, and compare them to their endogamous peers. As the current study attempts to solve the mystery of the relationship between interracial marriage and mortality, it asks a simple research question: "*Whether people in Black-White marriage have higher mortality risk compared to their same-race counterparts?"*. Answering

this simple question could unravel the first of many puzzles waiting to be solved. Also, in light of the differential effects of interracial marriage between men and women on their psychological stress, we also explore gender differences in interracial marriage effect on mortality. Guided by our research questions, we hypothesize that:

1a. People in Black-White marriage have higher mortality risk than their same-race counterparts.

1b. There is significant gender difference in interracial marriage effect on mortality risk.

DATA AND METHODS

Data and Sample

We use the Integrated Health Interview Series (IHIS) as our data source (Minnesota Population Center and State Health Access Data Assistance Center 2010). The IHIS is a harmonized dataset of the National Health Interview Survey (NHIS) from 1969 to 2009, which is the primary source of information on the health conditions of the U.S. population. The IHIS integrates over 40 years of NHIS data and its mortality follow-ups from 1986-2004, and therefore greatly facilitates the analysis of mortality and its potential social and economic covariates. Our data for analysis span from 1986 to 2004 during which the information on mortality status of the respondents are available. For analytic purposes, we limit our focus on the non-Hispanic Black and the non-Hispanic White population. The final analytic sample was identified through a series of selecting processes, which are summarized in the following.

The primary interest of this research is to explore the potential mortality gap between the interracially and the endogamously married. Therefore, we need to identify married couple, and acquire information on their interracial marriage status. First of all, only the Black and White people who reported their marital status as being married at the time of the surveys were selected for further filtering. Information on the relationships of respondents to the reference persons is also utilized for the identification of married couples. Only the reference persons and their spouses were able to be identified as married couples. Then we matched the reference persons and their spouses, and compare their self-report racial identity to determine their interracial marriage status. The final analytical simple size is 641,580[2].

Measures

Interracial marriage status. Our major covariate of interest is respondents' interracial marriage status. To determine whether the respondents are in interracial marriage, the reference person and their spouses were matched by their complete household ID, and their

[2] We selected out 159 same-sex couples who reported themselves as being married, and teased out 322 duplicate cases in the entire reference-spouse sample among Blacks and Whites.

self-reported racial status was compared to acquire the needed information. Three different combinations were identified in the final sample: Black-White, same-race Black and same-race White marriages. The two same-race marriages were further grouped together in the later bivariate analysis and Cox regression models[3]. A dummy variable was then created for further analysis. Interracial marriage status was coded as "1" if the respondents were in Black-White marriage, and the same-race marriage was the reference group.

Time to event. The respondents were coded as "1" if they were identified to be "assumed dead" in the mortality follow-ups, and "0" if "assumed alive". Age in years was used as the time of analysis. For respondents who were "assumed dead", their time to event was calculated by adding their age at the time of the surveys to the years elapsed from the survey years to their years of death. Respondents who were "assumed alive" in the mortality follow-ups, by definition, were censored, and therefore their time to event is actually their censoring time. As the maximum year of death identified among the dead was 2006, the censoring time for those censored cases were then calculated by adding their age at the time of the surveys to the years elapsed since the survey years to the year 2006.

Other covariates. several socio-demographic and socio-economic variables were documented to be predictive of individuals' mortality risk, and thus were included in our analytic model as controls. *Sex* was recoded as "1" for women and "0" for men. *Race* was recode as "1" for Blacks and "0" for Whites. Three dummy variables were created for *education level*: "High school graduate", "Some college", and "College graduate or above", with "Less than high school" as the reference group. Two dummy variables were created for *employment status,* "Employed" and "Not in the labor force", with the "Unemployed" as the reference group. *Household income* was recoded as a dummy variable: "More than USD 20,000", "Less than USD 20,000" as the reference category. Finally, as there has been considerable regional difference in the public attitude towards interracial marriage across the United States, region was also recoded as three dummy variables (Northeast, North Central/Midwest, and West, South as the reference category), and controlled in the models. A dummy variable for missing values was created for each set of the following variables with missing values: education, employment status, and household income. A summary of the descriptive statistics for each variable of analysis are presented in table 1.

[3] In our previous modeling results, the effect of race variable disappeared once we included the dummy variable, same-race Black, in the model. We argue that this is because the seemingly negative effect of same-race Black marriage as compared to the same-race White marriage is due primarily to the disadvantaged racial status as Blacks, not the unique combination of racial backgrounds. Therefore, we kept the race variable as a control in the models, and grouped the same-race Black and same-race White marriage as one single category.

Table 1. Descriptive statistics of variables of analysis, pooled NHIS 1986-2004 (N=641,580)

	Percentage	Count
Sex (N=641,580)		
Male	50	320,790
Female	50	320,790
Age (N=641,580)		
18 to 24	3.82	24,505
25 to 34	19.93	127,866
35 to 44	24.60	157,823
45 to 54	19.79	126,952
55 to 64	15.18	97,381
65 to 74	11.31	72,573
75 to 84	4.75	30,457
85 and above	0.63	4,023
Race (N=641,580)		
White	89.9	576,769
Black	10.10	64,811
Education Level (N=637,704 missing=3,876)		
Less than high school	15.26	97,331
High school graduate	38.26	244,004
Some college	22.52	143,626
College graduate	23.95	152,743
Employment Status (N=640,769 missing=881)		
Employed	67.07	429,759
Unemployed	1.97	12,647
Not in the labor force	30.96	198,363
Annual Household Income (N=567,584 missing=73,996)		
Less than USD 20,000	17.08	96,928
More than USD 20,000	82.93	470,656
Region (N=641,580)		
Northeast	20.38	130,760
North Central/ Midwest	27.78	178,250
South	35.21	225,932
West	16.62	106,638
Interracial Marriage Status (N=641,580)		
Black-White marriage	0.68	4,382
Same-race White marriage	89.56	574,578
Same-race Black marriage	9.76	62,620
Mortality Status (N=641,580)		
Alive	86.35	554,028
Dead	13.65	87,552

Analytic Strategies

We started our analysis by exploring the bivariate association between interracial marital status and mortality risk. To further examine the bivariate relationship, controlling for the strongest predictor of mortality, age, we estimated the hazard functions for the Black-White marriage and the same-race marriage separately, and plotted them for visual presentation. For our final step of analysis, we estimated the Cox regression model of interracial marriage status on mortality risk. The formal model could be specified as the following:

$$\log \frac{h_i(t)}{h_0(t)} = \sum \beta_j I_j + \sum \pi_k X_k \quad (1)$$

where I_j represents a series of interracial dummy variables, including the interaction term with sex. β_j is the corresponding coefficients. X_k represents the other covariates controlled in the model (ie. sex, race, education level, employment status, household income, and region), and π_k are the corresponding coefficients. Three models were estimated. All control variables were first entered in the baseline model. Interracial marriage status was entered in the second model to test our first hypothesis, and an interaction term of interracial marriage status, and gender was included in the last model.

RESULTS

Bivariate Relationship between Interracial Marriage Status and Mortality Risk

Our primary research concern in this paper is whether people in Black-White marriage suffer greater mortality risk than their endogamously married counterparts. We start by examine the bivariate relationship between interracial marriage status and mortality risk. Table 2 presents the distribution of death, the major event of interest in this study by individuals' socio-demographic and other socio-economic characteristics. The results in table 2 show a general picture of differential mortality risk among various social groups consistent with existing literature on the major predictors of mortality. Mortality risk increases with age, and female, those who are employed, and of higher socio-economic status enjoy longer life expectancy. Our major covariate of interest, however, seems to be at odds with major research hypothesis. As shown in table 2, the married people in Black-White intermarriage have a lower percentage of death than those in the same-race marriage. In other words, this bivariate relationship seems to suggest that people in endogamous marriage suffer higher mortality risk. This is actually an artifact confounded by the single most important determinant of mortality, age. Generally, interracially married people tend to be younger than their same-race counterparts. Consequently, the two groups have very different age composition. As mortality is highly age-dependent, this bivariate relationship between interracial marriage and mortality is confounded by the differential structure of these two groups considered. To further unravel this ostensibly contradictory first-order relationship, I estimated the hazard function of death separately for these two groups, controlling for age. The results are displayed in figure 1.

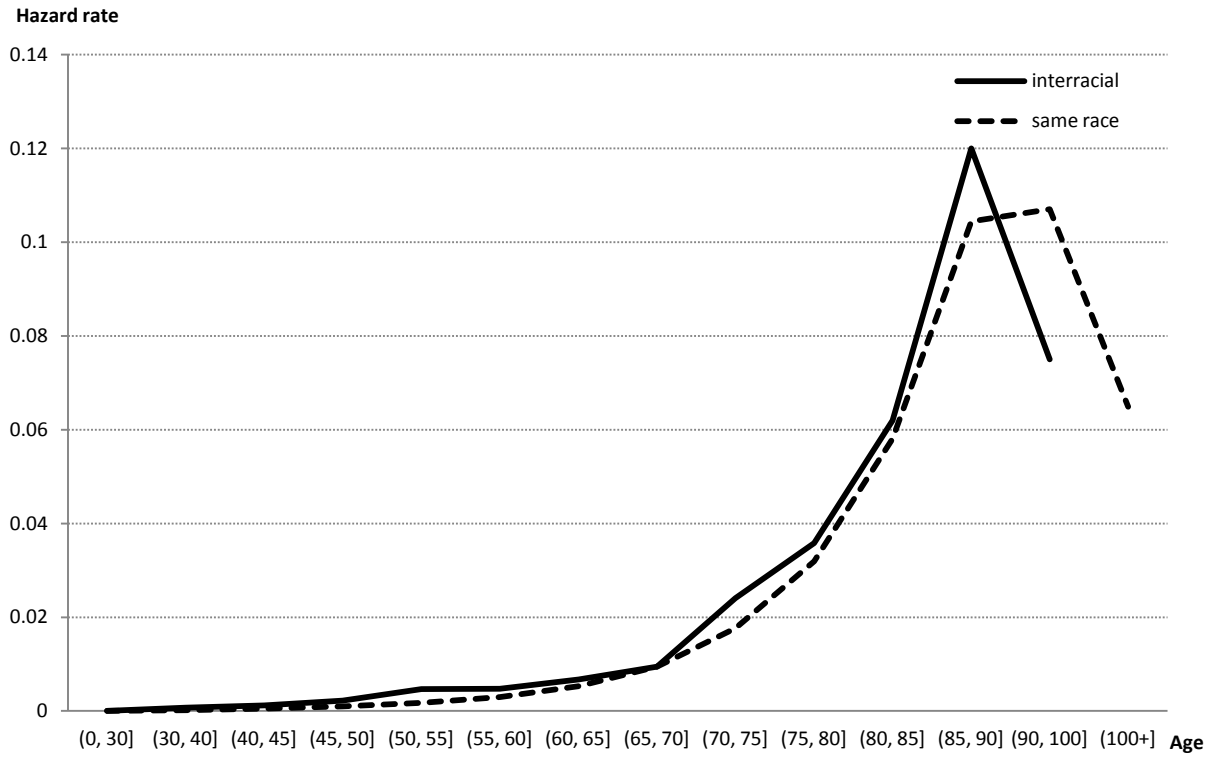
Table 2. Distribution of Mortality Status by Selected Socio-demographic and Socio-economic characteristics

	Alive	Dead	N
Sex (N=641,580)			
Male	82.85	17.15	320,790
Female	89.86	10.14	320,790
Age (N=641,580)			
18-24	98.92	1.08	24,505
25-34	98.41	1.59	127,866
35-44	96.69	3.31	157,823
45-54	92.31	7.69	126,952
55-64	80.37	19.63	97,381
65-74	59.60	40.40	72,573
75-84	38.46	61.54	30,457
85 or above	23.14	76.86	4,023
Education Level (N=637,704 missing=3,876)			
Less than high school	68.49	31.51	97,331
High school graduate	86.89	13.11	244,004
Some college	91.13	8.87	143,626
College graduate or above	92.54	7.46	152,743
Race (N=641,580)			
Non-Hispanic White	86.54	13.46	576,769
Non-Hispanic Black	84.71	15.29	64,811
Employment Status (N=640,769 missing=811)			
Employed	93.71	6.29	429,759
Unemployed	91.32	8.68	12,647
Not in labor force	70.06	29.94	198,363
Annual household income (N=567,584 missing=73,996)			
Less than USD 20,000	70.61	29.39	96,928
More than USD 20,000	90.58	9.42	470,656
Region (N=641,580)			
Northeast	86.25	13.75	130,760
North Central/ Midwest	86.97	13.03	178,250
South	85.78	14.22	225,932
West	86.68	13.32	106,638
Interracial status (N=641,580)			
Black-White marriage	93.93	6.07	4,382
Same-race marriage	86.30	13.70	637,198

Figure 1 presents the hazard rate of death for the endogamously married and the interracially married respectively. The hazard curves show that generally, across all age groups, the death hazard of people in Black-White marriage is consistently higher than those in same-race marriage, and the gap is particularly larger for those aged 70 to 80[4]. Simply by examining the differential death hazard of the two groups across different ages reveals a clearer picture of the relationship between interracial marriage and mortality risk. We can see that there does exist a significant relationship between interracial marriage status and mortality risk. People in Black-White marriage consistently suffer higher mortality risk than their same-race counterparts.

[4] One caveat regarding figure 1 needs to be mentioned though. The sudden drop of death hazard after age 85 for the Black-White marriage group, and that after age 100 for the same-race group is more of an artifact due to fairly small numbers of events, and should be interpreted with caution.

Figure 1. Estimated Death Hazard Rate by Interracial Marriage Status



Cox Regression Results of Interracial Marriage Status and Mortality Risk

To further investigate the relationship of interracial marriage status and mortality risk, controlling for major relevant covariates, I estimated the mortality risk for the entire sample, using the Cox regression model. The modeling results are presented in table 3. The socio-demographic and socio-economic covariates included in model 1 are all significant and exhibit the expected sign as predicted in previous studies. Women, in general, enjoy longer life expectancy as compared to men, while the death hazard for the Black is 1.26 times as high as the White, a conspicuous racial gap. Education, as expected, presents a negative relationship with mortality risk. People with higher educational attainment have lower mortality risk. The educational gap is particularly striking between people with college degrees or above, and those who do not have high school diploma. The death hazard of the former is only .77 times as high as that of the latter. As for the other socio-economic characteristics, the employed and those not in the labor force both show lower mortality risk than the unemployed, and annual household income are negatively associated with mortality risk. Mortality risk also exhibits regional differences. People residing in the other three regions all have lower mortality risk than those living in the South.

Model 2 includes our major covariate of interest, interracial marriage status. As informed by the existing literature, we hypothesize that the interracially married suffer higher

mortality risk than those married to spouses of their same race. The results in model 2 provide empirical support for our major research hypothesis. After controlling for the major socio-demographic and socio-economic covariates that have consistently been proven to have significant effect on mortality, interracial marriage status still exhibits a significantly positive relationship with mortality risk. As indicated by the hazard ratio, the death hazard of people in Black-White marriage is almost 1.38 times as high as those who are endogamously married. Such a mortality gap is even larger than the racial gap, which has been well documented in the mortality literature. Model 3 includes all the covariates in model 2 along with an interaction term of interracial marriage status and gender. As informed by the existing literature, men and women in interracial marriage face different levels of social pressure and discrimination. We expect that such differences might contribute to differential mortality risk between men and women in interracial marriage. To test this hypothesis, we include gender as a moderator of interracial marriage effect on individuals' mortality risk. The results in model 3 did not provide empirical support for our hypothesis of gender as a moderator. Contrary to our theoretical expectation, although it slightly decreases the main effect of Black-White marriage, the interaction effect of interracial marriage status and gender is not significant. In other words, the results in model 3 suggest that the effect of Black-White marriage does not differ by gender.

Table 3. Cox Regression of Interracial Marriage Effect on Mortality Risk (N=641,580)

	Model 1	Model 2	Model 3
Female	.690***	.690***	.690***
Black	1.26***	1.255***	1.255***
Education Level (Less than high school as reference)			
High school graduate	.975**	975**	975**
Some college	.887***	.886***	.886***
College graduate or above	.692***	.692***	.692***
Missing	.770***	.770***	.770***
Employment Status (Unemployed as reference)			
Employed	.699***	.699***	.699***
Not in the labor force	.533***	.533***	.533***
Missing	.453***	.452***	.452***
Annual Household income (Less than USD 20,000 as reference)			
More than USD 20,000	.873***	.873***	.873***
Missing	.838***	.839***	.839***
Region (South as reference)			
Northeast	.883***	.882***	.882***
North Central/Midwest	.906***	.906***	.906***
West	.890***	.889***	.889***
Interracial Marriage		1.375***	1.331***
Interracial Marriage*Female			1.110

Note:
1. * p < .05 ** p < .01 *** p < .001; the numbers reported in the table are estimated hazard ratios.

DISCUSSION AND CONCLUSION

Marriage protection effect has been well documented by many sociological as well as demographic studies. However, the existing literature paid little attention to the heterogeneity within the married population. Little research has examined the potential health consequences of interracial marriage. Our research serves as one of the first attempts to bridge this empirical gap by exploring the relationship of interracial marriage and mortality risk among the Black and White population. Our findings reveal a significant mortality gap between the interracially married, and the endogamously married. After controlling for relevant predictors of mortality risk, the death hazard of people in Black-White marriage is still more than 1.3 times as high as their same-race counterparts. This is more than a nontrivial effect. Although we cannot yet determine the causal relationship, and empirically testify the causal mechanisms, there is apparently something about marrying across the color lines that contribute to such health disparities. As we have discussed in the previous sections, there has been consistent social stigma, and discrimination against interracial marriage, and the dissolution rates of interracial marriages are also significantly higher than those in same-race marriages (Bratter & King 2008; Zhang & Hook 2009). These could all be potential sources of the negative health consequences of interracial marriage. Our findings suggest that marriage protection effects may not apply equally across different racial groups. Heterogeneity with the married population is also an important moderator in such protection effects. In addition, our research also provide some empirical support to the advocates of marriage equality that stigma of interracial marriage is still an issue needed to be addressed.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

One major limitation of our research is that we do not have information on marital transition or any indicator of marital instability to better address the causal mechanisms and determine the causal relationship, which are important mediators of the relationship between interracial marriage, and mortality. Future research should employ longitudinal data and include indicators of marital transition or marital instability to put together these missing pieces of the puzzle. In addition, future research should also control for possible selection mechanisms of entry into interracial marriage that might be confounding factors of the causal relationship of interest. It would also be wise to include more racial groups in the examination of interracial marriage and its potential health outcomes to provide more convincing evidence. Lastly, in light of the recent amelioration of public attitudes towards interracial marriage, it would informative of the scholarship to examine the temporal changes, such as cohort differences or trends, of the relationship between interracial marriage, and its health consequences.

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