

GENDER DIFFERENCES IN THE MECHANISMS LINKING SPOUSAL EDUCATION AND MORTALITY

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ABSTRACT

Education is inversely associated with mortality. Researchers typically conceptualize education as an individual-level health resource, but several recent studies, primarily in Europe, suggest that education is a pooled, or household, resource within marriage. These studies find a consistent link between spousal education and mortality. Some studies also suggest that a wife's education is a more important determinant of her husband's risk of death than his own education. Gender differences in the link between spousal education and mortality are important because they imply that men and women gain different resources via their spouse's education. To date, extant research on spousal education mortality is sparse – particularly in the U.S. Research that systematically examines the factors responsible for the association between spousal education and mortality are even less common. This paper will examine whether the mechanisms that potentially link spousal education and mortality differ by gender. I will address three questions with data from the Health and Retirement Study (HRS). First, to what extent do husbands' and wives' resources combine within a marriage to influence each other's risk of death? Second, do gender differences exist in how spousal resources linked to education combine to influence the risk of death? Third, assuming that an association exists between spousal education and mortality, how do specific resources associated with a husband's and wife's education combine to influence each spouse's overall risk of death? The dearth of research on spousal education and mortality, limits our ability to understand how family processes and socioeconomic status jointly determine individual-level health outcomes. The analysis will inform theoretical models of how individual resources related to health operate in a major social relationship and further our understanding of how various education-related resources "spillover" to influence the other people's health.

BACKGROUND

The inverse association between one's own education and mortality is unequivocal. However, the association between other people's education – particularly those people with close social ties or who are family members – and mortality is unclear. Social relationships are a conduit for the exchange of valuable material and material resources. Marriage is the most important social relationship in which adults *choose* to participate. Thus, the material and non-material resources available to *individuals* via their *own* education likely are pooled within a marriage to become resources at the *household* or *family-level*. The household is the most immediate and salient context in which broader social forces shape one's risk of death (Hughes and Waite 2002). Aside from the fact that the household is a social context, the link between spousal education and his/her partner's health makes sense when one considers the socio-emotional dynamics of the marital relationship. The close social, economic, legal, and emotional ties that spouses share create strong incentives to engage in a range of mutually beneficial behaviors and disincentives toward acting solely in one's own self-interest (Becker 1991; Jacobson 2000). As a result of these factors, spouses have an inherent motivation to pool their respective material and non-material resources in an effort improve their own and their partner's well-being (Becker 1991; Hujits, et al. 2009; Jacobson 2000; Monden, et al. 2003; Skalická and Kunst 2008; Smith and Zick 1994). The ability of each spouse to optimize his or her own health is conditional upon the contribution made by *both* one's own and a spouse's resources. Because the material and non-material resources associated with education are powerful determinants of health, pooling and/or exchanging resources gained via each partner's education is a particularly effective way for married couples to maximize household well-being.

Relatively few studies, especially in the United States, move beyond the individual-level to examine whether the education of others in the household, particularly a spouse's education, also influences one's own risk of death. In support of the idea that education is a pooled, or household, resource within marriage, several recent studies – primarily using data from European populations – consistently document an inverse association between a spouse's education and a variety of individual-level health outcomes (Egeland, et al. 2002; Jaffe, et al. 2005, 2006; Kravdal 2008; Martikainen 1995; Monden, et al. 2003; Skalická and Kunst 2008) and many of these studies also suggest that omitting spousal education in models predicting health and/or mortality may actually overestimate the importance of an individual's own education on his/her risk of adverse health outcomes. In stark contrast, most of the few existing nationally representative studies to examine this association in the U.S. context generally suggest that there is no association between spousal education and health/mortality (Smith and Zick 1994; Haveman, et al. 1994; Smith and Kington 1997; McDonough, et al. 1999). An exception to this is a study by Lillard and Waite (1995), which suggested that a husband's education was not associated with his wife's risk of death, but a wife's education did share an inverse association with her husband's risk of death. Notably, this study also suggested that a wife's education was a more important predictor of her husband's risk of death than his own education. Although gender differences in the influence of spousal education on mortality are not documented consistently, patterns similar to those documented in the PSID by Lillard and Waite (1995) were documented recently with data drawn from Norwegian (Skalická and Kunst 2008) and Israeli (Jaffe, et al. 2005, 2006) populations.

These gender differences in the association between spousal education and mortality are intriguing. An individual's education plays a critical role in shaping his/her ability to mobilize a variety of socioeconomic, sociobehavioral, and psychosocial resources instrumental in the promotion of mental and physical well-being (Ross and Mirowsky 2003). However, there is evidence that the resources men

and women gain from marriage and educational attainment differ. For example, prior research consistently shows that women reap fewer health benefits from marriage than do men (Ross, et al 1990; Carr and Springer 2010; Waite and Gallagher 2001). Some research suggests that education is a more important determinant of health for women than men because women reap fewer socioeconomic rewards from their education than do men (Ross and Mirowsky 2006; Ross and Mirowsky 2010). The types of resources that women and men gain from education also probably differ (Zajacova 2006). For example, women may gain fewer economic resources from their own education than men (Kilbourne, et al. 1994), but more sociobehavioral resources from their own education than do men and the opposite may be true for men (Ross and Mirowsky 2006, 2010; Zajacova 2006).

Moreover, most studies on spousal education and health/mortality assume that the resources gained via a spouse's education closely resemble the resources individuals acquire via their own education (Hujits, et al. 2009; Kravdal 2008; Monden, et al. 2003). These mechanisms include material and economic resources, psychosocial resources, and a healthy lifestyle (Ross and Wu 1995). However, the mechanisms specifically responsible for the association between spousal education and mortality are poorly understood, especially in the United States. For example, it is likely that a husband's economic resources may be especially important for his wife, and the sociobehavioral resources linked to a wife's education may be especially important for her husband (Lillard and Waite 1995). This essentially is an inter-individual variant of an intra-individual process referred to as resource substitution. Resource substitution theory argues that when individuals lack a given type of resource, the other resources that they have fill the void to become more important determinants of health (Ross and Mirowsky 2006; Ross and Mirowsky 2010).

RESEARCH QUESTIONS

The purpose of the proposed paper is to provide an empirical evaluation of the mechanisms through which spousal education influences all-cause mortality in the United States. Specifically, I will address three interrelated questions. First, to what extent do husbands' and wives' resources combine within a marriage to influence each other's health? Second, do gender differences exist in how spousal resources linked to education combine to influence health? Third, assuming that an association exists between spousal education and mortality, how do specific resources associated with a husband's and wife's education combine to influence each spouse's overall risk of death? The analysis will inform theoretical models of how individual resources related to health operate in a major social relationship. Moreover, it is important to consider how a spouse's characteristics potentially influence the effects of each partner's education on an individual's own risk of death because it will further our understanding of how various education-related resources "spillover" to influence the health of other people. The analyses in this paper will provide a clearer picture of how education actually operates within the context of the household to influence mortality.

ANALYTIC APPROACH

Data

The data in this analysis will come from the Health and Retirement Study (HRS). The HRS is a nationally representative longitudinal survey of the U.S. non-institutionalized, civilian population ages 51 and older and their spouse that began in 1992. The analyses in the paper will use data from all available waves of the RAND HRS Data File (Version L, 1992-20010). I use the HRS because it has

many high-quality measures of the resources thought to be responsible for the association between spousal education and mortality and, importantly, these measures are assessed longitudinally. These qualities will allow me to examine issues such as the “spillover” effects of a spouse’s occupation and/or income. Additionally, the HRS has longitudinal information on health behaviors and changes in those behaviors. This will allow me to gauge how health behaviors operate through each spouse’s education to influence an individual’s risk of death. Finally, the HRS has longitudinal data on marital status transitions. Therefore, I will be able to grapple with issues related to divorce and widowhood in a more nuanced manner with the HRS than I could in the NHIS-LMF. Initially, I plan to restrict the sample to respondents ages 50 and older who were currently married at the time of their initial interview. This approach is consistent with recent research on spousal education and mortality. However, I will conduct sensitivity tests (selection models, etc.) to assess whether limiting analyses only to married persons biases my results.

Measures

The dependent variable will be all-cause mortality. Estimated mortality rates generated from the HRS closely approximate those in the U.S. vital statistics (for details, see Brown, et al. 2012). I will conduct preliminary analyses to determine the best way to specify the independent variables given the information available in the HRS. The HRS provides a great deal of information concerning health behaviors, specific conditions, and, most notably, economic measures (e.g., wealth, personal income, household income, etc.). Also, the longitudinal nature of the HRS will allow me observe changes in these variables over time. In addition to controls for own education, spouse’s education, age, and nativity status, the independent variables in the models will include the factors thought to link spousal education and health. These include socioeconomic resources (i.e., income, wealth, employment, etc.), behavioral resources (i.e., smoking history, physical activity), various psychosocial resources and background characteristics (i.e., parental education, father’s occupation, etc.). Therefore, as I begin preliminary analyses, I will carefully consider whether or not to include some or all of these factors and modify my analytic strategy accordingly. I plan to include measures of early-life SES in an attempt to deal with assortative mating/selection. The logic behind this is that if I have a better idea of how/why people are choosing to marry a person with a given set of characteristics, I might partially be able to mitigate confounding due to selection into marriage. I will structure the data as a person-year file and allow key variables to vary over time.

Statistical Approach

The main results of the paper will come from a series of nested Weibull models fit separately for men and women. In preliminary analyses, I plan to examine alternative distributional forms for the baseline hazard to obtain a model that fits the data best. Additionally, in an attempt to gauge the extent to which my results are driven by unobserved heterogeneity, I will pool men and women together and fit a series of Weibull models with couple-specific shared frailties. Shared frailty models are the survival analysis analog to random-effects regression models (Gutierrez 2002). In the models, the frailty – or random effect – parameters represent a set of unobserved characteristics shared between spouses that multiplicatively increase or decrease the risk of death. It is important to note that estimating shared frailty models represents only one of many methodological strategies to deal with selection. As is the case with any statistical approach to dealing with selection, this approach is imperfect. I cannot conclusively rule-out the possibility that my results are driven by selection, but estimating shared frailty models helps to mitigate this possibility. Thus, I will employ a variety of techniques to ensure that my results are valid.

The first set of models will mimic the approach usually taken in studies examining educational differences in older adult mortality and establishes the basic association between a person's own education and his/her risk of death net of age and nativity status. A second set of models will introduce a set of coefficients for spousal education. These models evaluate the extent to which a spouse's education attenuates the association between an individual's own education and his/her risk of death and gauge the extent to which omitting spousal education from the model overestimates the importance of a person's own education his/her risk of death. Importantly, if education is a household resource within marriage, then a person's own education and the education of his/her spouse should have an additive effect on the risk of death. A third a series of multiplicative interaction terms for own education and spouse's education. These models evaluate the extent to which being in an educationally heterogamous marriage influences a person's risk of death. In subsequent models, I will estimate will progressively adjust for blocks of covariates thought to mediate the association between spousal education and mortality. These covariates will include socioeconomic resources (i.e., income, wealth, employment, etc.), behavioral resources (i.e., smoking history, physical activity), various psychosocial resources and background characteristics (i.e., parental education, father's occupation, etc.). Moreover, I will also estimate a set of models that include a control for widowhood, divorce, and the length of marriage.

I will conduct F-tests (Chow 1960) to examine whether there are statistically significant gender differences in the effects of own education, spouse's education, and the mediators on the risk of death. I will also asses this via models that include education*gender interactions terms. The descriptive statistics and hazard models will be weighted and the standard errors will be adjusted for the clustered sample design in the HRS using the "svy" option available in Stata SE version 12.

SUMMARY

The proposed paper will examine the mediators potentially responsible for the association between spousal education and all-cause mortality risk in the United States. It will also specifically examine whether these mediators operate differently among men and women. However, the models estimated in this analysis being to tease-out the actual socioeconomic, sociobehavioral, and (potentially) social psychological resources that may link other people's education to an individual's own risk of death. It is important to consider how a spouse's characteristics potentially mediate the effects of each partner's education because it will further our understanding of how various education-related resources "spillover" to influence the health of other people. It will also provide a more nuanced picture of how education actually operates within the context of the household to influence health outcomes. The proposed analyses are important because to the extent that a spouse's education influences one's own mortality risk, this provides evidence that education-related resources of others in social relationships are an important component of education's total effect as a "fundamental cause" of health.

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