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The effect of relationship status on health with dynamic health and persistent relationships☆

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ABSTRACT

The dynamic evolution of health and persistent relationship status pose econometric challenges to disentangling the causal effect of relationships on health from the selection effect of health on relationship choice. Using a new econometric strategy we find that marriage is not universally better for health. Rather, cohabitation benefits the health of men and women over 45, being never married is no worse for health, and only divorce marginally harms the health of younger men. We find strong evidence that unobservable health-related factors can confound estimates. Our method can be applied to other research questions with dynamic dependent and multivariate endogenous variables.

1. Introduction

Does marriage cause good health? An extensive literature spanning the disciplines of economics, sociology and psychology has made the association between marriage and health "one of the most robust in the social sciences" (Liu, 2012). If the association is truly causal, then recent declines in marriage in most developed countries including record low marriage rates in the US (UN Demographic Yearbook, 2006; Gartner, 2010) may further destabilize fragile health care systems. However, while the marriage and health literature has tended to find that marriage is beneficial for health, and has even characterized the health effect of marriage as comparable to the effect of quitting smoking (Wilson and Oswald, 2005), this result is not universal.

Core features of the data pose econometric challenges to disentangling the causal "protection" effect of marriage from the "selection" effect that healthier individuals are more likely to get married, all else equal. Specifically, an individual's health today is strongly related to their health yesterday (Contoyannis et al., 2004), and most people do not frequently change relationships. When individuals do change relationships, they are either younger so they experience fewer health changes needed to identify any causal effect on health, or such changes (e.g. divorce) may make their experience not generalizable to those in stable relationships beyond the "honeymoon" or "break-up" transition period. In light of changing social norms, political and economic challenges to traditional marriage, additional evidence on the causal effect of relationships on health has meaningful public policy implications.

Our contribution in this paper is a new econometric method that better accommodates dynamic health in the presence of persistent relationships in a way that not only controls for, but also obtains estimates on heretofore unobservable heterogeneity. By incorporating estimates of the heterogeneity associated with both health and relationship choice in the dynamic health equation we avoid differencing out this heterogeneity and identify the coefficients on relationships using all of the observations, not just those that change relationship status. We use a continuous health index that

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reflects overall health, has more variation over time than the often-used categorical self-assessed health, and facilitates inferences in a linear dynamic model. Our method requires a shorter time series than the Blundell and Bond dynamic panel data estimator and thereby allows us to separate our sample by both gender and age. To our knowledge we are the first to estimate the effect of relationships on health by both gender and age subgroups using a single large panel data set.

We find that cohabitation is better for health than marriage for men and women over 45, but no different than marriage at younger ages. Consistent with prior literature, we find a negative effect of divorce on health, but only for men under 45. Finally, with our new method we can confirm that in many cases unobservable heterogeneity correlated with both past health and relationship status is a significant confounder of the effect of relationship status on health. The signs of the effects of unobservable heterogeneity on health shed additional empirical light on cases of both positive and adverse selection into marriage that have been found in prior literature.

Although this paper focuses on the effect of relationship status on health, there are other potential applications that have a dynamic outcome and largely time-invariant endogenous independent variables of interest. Examples include the effect of insurance type, education, home ownership or employment status, all states that exhibit strong persistence, on the dynamic outcomes of health and/or medical care use (Kohn and Liu, 2013). Our method treats unobservable heterogeneity not as an "ancillary nuisance" but a focus of our investigation which is common in the marketing literature (Allenby and Rossi, 1999) but less so in health economics. As health treatments become more individualized and the health insurance markets expand on new exchanges, empirical attention to the distribution of heterogeneity rather than the mean effect may prove valuable.

The paper proceeds as follows. Section 2 reviews the literature on the effect of relationships on health with a focus on more recent findings and methodological innovations. Section 3 develops our methodology in three parts: the dynamic health equation, estimating unobservable heterogeneity, and identification. Section 4 describes the data, Section 5 presents the results, and Section 6 concludes the paper.

2. Literature review

An extensive literature links marriage to health outcomes and longevity (see Waite and Gallagher, 2005; Wilson and Oswald, 2005; Wood et al., 2007 for recent reviews).[1] As noted above, the central challenge in this literature has been to untangle the effect of marriage per se from selection of the healthier into marriage. The overwhelming majority of the research in this area has relied on longitudinal data and an individual fixed-effects or first-differencing research design to net out the unobservable heterogeneity hypothesized to be associated with both health and selection into a relationship. Most studies in these reviews point to marriage as having a positive or beneficial effect on health, particularly but not always for men. However, digging deeper, the literature has not reached a consensus on a measure of health. In fact, the number of health outcomes used are so numerous that Wood et al. (2007) divide their review by the health outcome under consideration: the effect of marriage on health behaviors; health care access, use and cost; physical health; mental health and longevity. The use of a variety of dependent variables makes it difficult to draw conclusions about the effect of marriage on overall health. For example, while marriage has been found to lead to fewer risky behaviors (e.g. smoking), it has also been found to lead to higher obesity rates.

Early studies considered marriage only, but more recent work has considered married and cohabiting as separate relationships. The key question is the mechanism by which relationships may be good for health: are married individuals more likely to invest in relationship-specific human capital than those who merely cohabit? It may also be the case that cohabiters are more likely to be risk-takers or have different attitudes toward relationships than those who marry (Wu and Hart, 2002). Wu et al. (2003) found that cohabitation may be as beneficial for health as marriage, but they used only cross-sectional data thus could not control for either health dynamics or unobservables. Musick and Bumpass (2011) used fixed effects with a relatively small (<2000) US sample of individuals under 50 and find mixed evidence on the difference between marriage, cohabitation and remaining single on a myriad of different health, happiness and social relationship outcomes.

A recent paper by Averett et al. (2013) brings together the three issues of multiple dependent variables, fixed effects and cohabiting versus marriage. Using data from the same Canadian National Public Health Survey as Wu et al. (2003) and an individual fixed-effects identification method, they examine the effect of relationships (including marriage and cohabitation) on a variety of outcomes including obesity, body mass index (BMI), substance use, chronic health conditions, self-rated health and depression. Their key finding is that the effect of relationship status on health depends on the health outcome. For self-assessed health, they find no effect of marriage or cohabitation for men, but a negative effect of divorce for women. For depression, they find married and cohabiting men and women are less depressed than those who never married, but divorced women are more depressed. Notably, both men and women in relationships (married or cohabiting) have increased BMI and probability of overweight or obesity. However, married men and women are less likely to smoke and drink alcohol compared to never married individuals, though the same is not true of those who are cohabiting. Thus, while there is evidence of various effects of relationships on health, the overall effect remains unclear.

Notably, we are aware of only two papers that make use of methods other than individual fixed effects to identify the effect of marriage on health. Lillard and Panis (1996) use a system of simultaneous equations involving mortality, health (as measured by self-assessed health), marriage formation, and marriage dissolution. With longitudinal data from more than 4000 men from the Panel Study of Income Dynamics they find that married persons live longer. They also report health-related adverse selection into marriage for men (sicker men remarry more quickly) but positive selection into marriage based on unobservables. Their method, while appealing because they directly control for selection, hinges on instruments that determine marital status but are unrelated to health (instruments include if anyone in the household is a smoker, did the respondent grow up in poverty, did the respondent grow up in a small town, and parent's education). Ali and Ajiloare (2011) use propensity score matching to account for the potential selection bias. Since they only have cross-sectional data they cannot control for unobservables. Their results show that marriage reduces risky behaviors, specifically drinking and drug use for African Americans. Their sample encompasses a narrower age range because they use data from the third wave of the National Longitudinal Survey of Adolescent Health whose respondents are aged 18–27 years.

Kohn and Averett (2013) was the first paper to model health as a dynamic process and use a continuous health index. Adding

[1] A separate, but closely related literature explores the effect of relationship transitions on health. For the sake of parsimony, we do not explore that literature here. Interested readers may consult Williams and Umberson (2004), and the references therein.