Education of Children and Differential Mortality of Parents: Do Parents Benefit from Their Children's Attainments?

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Extended Abstract for PAA 2009

INTRODUCTION

The association between one's own socioeconomic status (SES) and health and survival is, by now, well-documented across the globe (Mare, 1990; Smith and Kington, 1997; Liang et al. 2000; Lynch, 2003). Higher levels of education, in particular, are associated with better health, even more so than income. The literature on the relationship between SES and health is vast. Despite an extensive body of work, however, few studies have explored the effects of socioeconomic status beyond that of the individual or married couple. A notable exception is a recent body of work by Zimmer and colleagues, which demonstrates that children's education is associated with older parents' physical functioning in China and Taiwan and with mortality in Taiwan (Zimmer et. al 2002; Zimmer and Kwong 2003; Zimmer et. al, 2007). Although children's education may be more influential on a parent's outcomes in a collective society, such as that of Taiwan, there is certainly reason to believe that Western parents can benefit from their children's education as well.

In this paper, we argue that the same mechanisms that work through one's own education to improve survival -- such as greater access to health information, more income, flexible jobs, and a healthier lifestyle overall -- may be provided to parents by their children. Adult children may enable their often less-educated parents to achieve the health privileges enjoyed by the more educated. Additionally, even well-educated parents may not be fully aware of the latest technology and health

information, and their educated children may help inform them. By educating their children, in other words, parents may be increasing their own survival.

BACKGROUND

Sociological literature on the "strength of weak ties" suggests that there is great value in even “weak” social ties that link individuals to social networks otherwise out of reach (Granovetter, 1973). These connections can be useful for diffusing information and providing access to resources heretofore unavailable. Although this literature is typically focused on weakly linked broader social networks, a diverse kin network could provide similar, and potentially stronger, benefits. A family network that includes even one highly educated member could provide all members of the group with access to resources that would ordinarily be unavailable. This has indeed been found to be true of reports of financial security, which is rated higher by individuals with “better off” social networks, even after controlling for their own socioeconomic traits (Goldstein and Warren, 2000).

The idea that the health of one individual can be affected by the characteristics of his network is hardly new. Research on the interdependence of the smallest kin unit – the married couple -- has a long history. It is well known that marriage can be good for health and that the death of one spouse can speed up the mortality of the other (Lillard and Waite, 1995). In addition, adolescent and young adult siblings influence each other's smoking and drinking behaviors (Boyle et al., 2001; Rajan et. al., 2003), and these effects do not end in young adulthood. Smoking, obesity, and even happiness on the part of one individual influences others within both kin and friendship networks to adopt like behaviors (Christakis and Fowler, 2007; Christakis and Fowler, 2008; and Fowler and Christakis, 2008). Inasmuch as obesity and smoking behaviors are correlated with educational attainment, the level of education of social networks may influence the health and survival chances of the network as a whole.

DATA AND METHODS

We use data from the 1992-2006 waves of the Health and Retirement Study (HRS) and Asset and Health Dynamics among the Oldest Old (AHEAD) studies. We use a Cox continuous-time event history approach, as we have month and year information for both birth and death (in time for PAA we hope to use restricted data to update this to exact date of death). We model survival curves for men and women as a function of their own socioeconomic characteristics (i.e. education, income, and wealth), their spouse's socioeconomic characteristics, their family composition, the educational attainments of their children, and other controls (race, region, birth cohort, etc.). Data on men and women of various ages are pooled in these analyses, yet we allow baseline hazards to vary by sex and birth cohort of the respondent. As we have numerous waves of data, all socioeconomic and family variables are allowed to vary over time.

MEASURING CHILDREN'S EDUCATION

The HRS contains child rosters in each year with time-varying information on age, sex, and education for all of a respondent's and respondent's spouse's children, grandchildren and children-in-law (in the analysis, we only include respondents' and spouse's biological, adopted, and step- children). As most of the families in this analysis have multiple children, there are at least as many ways to construct the education of the children in the family as there are children themselves. In preliminary work, we considered several constructions of children's education. In this paper, however, we primarily focus on children's education as a categorical variable similar to that used to measure their parents' education. We separately code sons', daughters', and all children's education into the percent in each of several educational categories, including the percent of sons, daughters, and children in the family with: Less than 12 years of schooling; 12 years of schooling; 13-15 years of schooling; and 16+ years of schooling.

The advantage to viewing children's education as a categorical variable rather than a linear average is that gains from children's education need not be linear, perhaps once children are educated beyond a particular threshold, say, college, only then does their education affect their parents' survival.

PRELIMINARY FINDINGS

Effects of Children's Education on Parents' Mortality

Our preliminary results suggest that although a parent's own socioeconomic characteristics remain statistically significant even after children's attainment is added to the models, children's education does significantly affect parents' mortality. We find that the greater the percent of children who are high school dropouts, the higher the risk of dying in a given year. On the flip side, having a larger percentage of college educated children significantly decreases a parent's risk of dying. We find no significant difference in the effect of children's education on mothers as compared to fathers.

Does Children's Gender Matter?

When we break down children's attainments into that of sons' vs. daughters' schooling, we find that both daughters and sons who are highly education improve parents' life chances. However, having a larger proportion of daughters who are high school dropouts hurts parents' chances of survival whereas this same effect is not true for having less educated sons. Even more interestingly, when we consider gender of parent, we find that the effects of educated daughters on parents' mortality is only statistically significant for mothers, but not for fathers. This suggests that although the effect of sons' education on parents' mortality is comparable for mothers and fathers, daughters affect parents differently. It is only mothers, but not fathers, who significantly benefit from having educated daughters.

Effect of Children's Education by Parents' Education and Age

We also consider whether the effect of children's education on parents' survival varies by the socio-demographic characteristics of the family, including the parents' own education and their age. We would expect that parents who are already highly educated gain less from an educated child than do parents with children who exceed their level of education. In our preliminary findings, the strongest difference we find between parents of different levels of schooling is in the effect of having high school dropout children on survival. This effect is much more pronounced for college-educated parents than it is for parents of lesser levels of education. This suggests that although there are positive effects to having educated children, the negative effects on parents of their least educated children need be considered as well, and these may be most harmful to well-educated parents.

Finally, we also investigate whether the effect of children's education varies by age of parent. We consider age as a continuous variable and as an indicator variable identifying parents who are over age 70 from those who are not. Both approaches show similar and significant results and suggest that older parents have the least to gain from more educated children. On the flip side, they are also the ones who are least hurt by having children who are high school dropouts. These findings show that once parents reach old age, having educated children matters less for survival.

IMPLICATIONS

This paper looks beyond individual-level socioeconomic status and treats education as a shared resource within the family. We find that, even in the U.S., children's education does affect parents' survival. The policy implications of this finding are significant and suggest that rather than directing interventions at one particular generation, the interdependence of family members need be considered. Improving education and increasing schooling in one generation, for instance, can have potential effects not only on that generation and the generations to come but even on the health of the prior generation. In addition, health interventions for one generation should perhaps be coupled with educational interventions for their children to maximize their effects. The interdependence of parents and children and both upward

and downward effects of education on health need be considered to fully understand the implications of any health and education policy.

NEXT STEPS

Our current work shows that investing in children's education increases parent's chances of survival. In time for PAA, we hope to use recently acquired restricted data on cause-specific mortality in addition to all-cause mortality. If children do indeed improve their parents' health behaviors, these effects should be noticeable both in terms of the raw odds of dying in a given year and also in the specific causes of death. For instance, if parents of more-educated children are less likely to smoke and more likely to eat right, on average, than are parents of less-education children, they should both live longer and also be less likely to die of such illnesses as coronary heart disease and lung cancer. However, we would not expect to see cause-specific mortality differentials when it comes to other ailments. In sum, we will examine whether parents of more-educated children are less likely to die of specific deaths (such as those caused by unhealthy and risky behaviors) than are other adults.

REFERENCES

Boyle M.H., M. Sanford, P. Szatman, K. Merikangas, and D.R. Offord. 2001. "Familial Influences of Substance Use by Adolescents and Young Adults." *Canadian Journal of Public Health* 92: 206-9.

Christakis N.A. and J.H. Fowler.2007. "The Spread of Obesity in a Large Social Network Over 32 Years." *New England Journal of Medicine,* 357(4): 370-379.

Christakis N.A. and J.H. Fowler. 2008. "The Collective Dynamics of Smoking in a Large Social Network," *New England Journal of Medicine*, 358(21): 2249-2258.

Fowler J.H. and N.A., Christakis. 2008. " Dynamic Spread of Happiness in a Large Social Network: Longitudinal Analysis over 20 Years in the Framingham Heart Study." *British Medical Journal*, 337: 1-9

Goldstein, J. R. and J. R. Warren. 2000. Socioeconomic Reach and Heterogeneity in the Extended Family: Contours and Consequences. *Social Science Research* 29: 382–404.

Granovetter, M.S. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78: 1360-1380.

Liang, J., J.F. McCarthy, A. Jain, N. Krause, J.M. Bennett, and S. Gu. 2000. “Socioeconomic Gradient in Old Age Mortality in Wuhan, China.” Journal of Gerontology: Social Sciences 55B: S222–S233

Lillard L.A. and L.J. Waite. 1995. "Til Death Do Us Part: Marital Disruption and Mortality," *American Journal of Sociology,* 100: 1131-56.

Lynch, Scott M. 2003. “Cohort and Life-Course Patterns in the Relationship Between Education and Health: A Hierarchical Approach.” *Demography* 40:309-332.

Mare, R. D. 1990. "Socio-economic Careers and Differential Mortality Among Older Men in the United States." Pp. 362-87 in Jacques Vallin, Stan D'Souza, and Alberto Palloni (eds.), *Comparative Studies of Mortality and Morbidity: Old and New Approaches to Measurement and Analysis*. London: Oxford Univ.

Rajan K.B., B.G. Lerouz, A.V. Peterson, J.B. Bricker, M.R. Anderson. 2003. "Nine Year Prospective Association Between Older Siblings' Smoking and Children's Daily Smoking." *Journal of Adolescent Health* 33:25-30.

Smith, James P. and Raynard Kington. 1997. “Demographic and Economic Correlates of Health in Old Age.” *Demography* 34:159-70.

Zimmer, Z., A.I. Hermalin, and H.S. Lin. 2002. “Whose Education Counts? The Added Impact of Adult-Child Education on Physical Functioning of Older Taiwanese.” Journal of Gerontology 57B:S23–S32.

Zimmer, Z. and Kwong, J. 2003. "Family Size and Support of Older Adults in Urban and Rural China.” *Demography* 40(1):23-44.

Zimmer, Z., Martin, L. G., Ofstedal M.B., and Chuang Y.L. 2007. “Education of Adult Children and Mortality of their Elderly Parents in Taiwan.” *Demography* 40(1):23-44.