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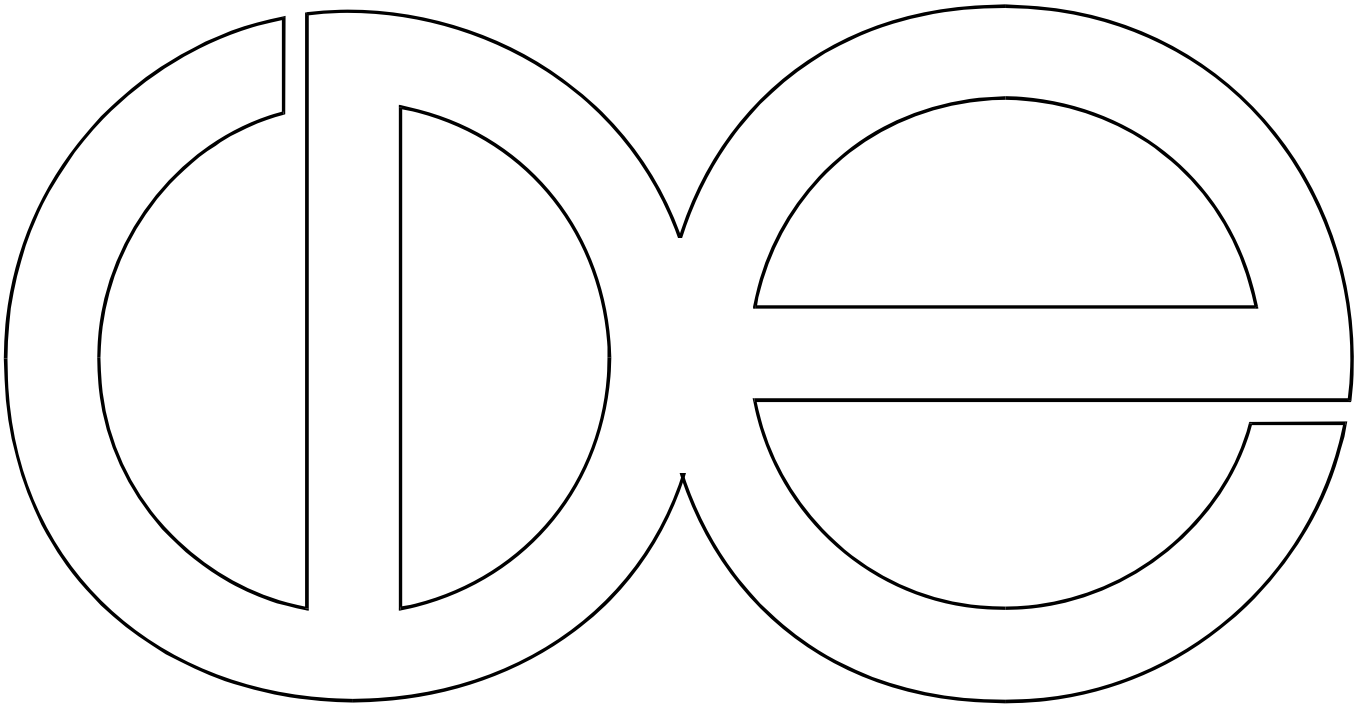

Intergenerational Health Selection in Wealth: A First Look at Parents' Health Shocks and *Inter Vivos* Financial Transfers*

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Abstract: Researchers have explored the considerable negative effect of an individual's or his spouse's poor health on their wealth accumulation. Health selection may also operate across generations, affecting the wealth of children whose parents suffer from poor health. We develop an intergenerational model of health selection in wealth using life course theory to understand whether parents' non-fatal serious health events affect *inter vivos* financial transfers to children. First we estimate the effects of parents' health shocks in adulthood on wealth accumulation, showing that data from the Wisconsin Longitudinal Study reproduce results from research using U.S. national panel studies and supporting the generalizability of our intergenerational health selection results. We find strong evidence of an intergenerational health selection effect. Individuals with less initial wealth are about 34 percent more likely to transfer money to their children and transfer 60 percent more money to their children when they do.

Intergenerational Health Selection in Wealth: A First Look at Parents' Health Shocks and *Inter Vivos* Financial Transfers

It is by no means news that health and wealth are intricately connected across the life course. A plethora of research explores the nexus between wealth and health, documenting relationships between wealth stocks and mortality, functional disability, self-reported health status, and a number of specific health conditions. Most of this research focuses on how wealth may affect health. A smaller body of health selection research focuses on the path from health to wealth accumulation. Underscoring the scant amount of research on health selection in wealth, social scientists have called for more research on the means and ways health may affect wealth accumulation (e.g., Smith, 1999). We heed this call, drawing on three disparate literatures on health selection, intergenerational transfers, and the life course to answer the question: How do parents' health shocks affect *inter vivos* financial transfers to their children?

This is an important question both for its scientific and its practical significance. The health selection literature demonstrates a relatively large negative effect of an individual's or spouse's serious health event on their wealth accumulation. Yet, a large literature in sociology and economics points to the importance of *inter*generational processes of wealth accumulation. Economic research in particular demonstrates that *inter vivos* financial transfers are a key building block of individual wealth (Gale & Scholz, 1994).[1] Thus, the health of one generation may matter not only for its own wealth accumulation but also for wealth accumulation in the next generation. To our knowledge, no research has addressed this possibility, making our intergenerational health selection model and its application to *inter vivos* financial transfers of scientific value. Moreover, it is exactly these sorts of intergenerational processes that undergird systems of inequality, imbuing our research question with is practical significance.

We have two main objectives in this paper. First, we replicate previous estimates of the effects of an individual's or spouse's health shock on their wealth accumulation using data from the Wisconsin Longitudinal Study (WLS). In doing so, we aim to establish the reliability and generalizability of our findings vis-à-vis intergenerational health selection in wealth because they are based on rich but select data rather than the national data typically used in health selection research in the U.S. Second, we use life course theory to explore how parents' and their children's lives are linked through parents' health shocks. We specifically focus on the financial link between parents and their children following parents' serious health events, operationalized as financial transfers to children in the parents' lifetime.

We begin with a brief review of the extant research on health selection and intertransfers before laying out our life course framework and developing an intergenerational health selection model drawing on important points in this framework. We next describe our data and models in detail. After discussing our research findings, we conclude by discussing the implications of our findings and future research.

HEALTH SELECTION IN WEALTH: INTRA- AND INTERGENERATIONAL MODES

Research in the U.S. on the many connections between socioeconomic status and health is substantial and growing in the context of stark and persistent health inequalities, increasing health care costs, and an aging population in the U.S. Within this broad body of research, most work has focused on the effect of wealth on health, that is, social selection in health. Generally, this literature finds asset accumulation is positively associated with a number of facets of health including self-rated health, functional health, and myriad chronic conditions net of income, educational attainment, and standard demographic controls (Robert & House, 1996; Adams,

Hurd, McFadden, & Ribiero, 2003; Smith & Kingston, 1997). Comparatively little research, however, has focused on the path from health to wealth, and scholars from a gamut of disciplines have called for further research on the topic (e.g., Smith, 1999; Palloni, 2006).

Discussions of health selection in the literature largely turn on the deleterious effects of an individual's poor health on his or her socioeconomic status. Key health selection theories such as health drift and health stunting underscore this deleterious effect (Chirikos & Nestel, 1985; Smith, 1999; 2005).[2] Numerous analyses substantiate the significance of negative health selection for various measures of individual socioeconomic status. However, these analyses find relatively small health selection effects for social class (Chandola, Bartley, Sacker, Jenkinson, & Marmot, 2003; Manor, Matthews, & Powers, 2003), socioeconomic status (Hammarstrom & Janlert, 2005), and labor force participation (Smith, 2005). The largest health selection effects are observed for wealth accumulation.

Research on health selection in wealth focuses on poor health either in early childhood (Palloni, 2006; Haas, 2006) or in mid to late adulthood (Smith, 1999). In this paper, we focus on a poor health shock in mid-adulthood. To isolate the effect of a health shock in adulthood, scholars have generally utilized select sources of national panel data that include information about the onset of a new and arguably unforeseen health condition. Health shocks in adulthood sometimes lead to substantial wealth depletion in the U.S. Lee and Kim (2003) consider whether an individual experiences a 10 percent or greater decline in wealth in the face of a serious health event for an individual or her/his spouse in the Asset and Health Dynamics of the Oldest Old (AHEAD) study. Net of various controls, a husband's health event is significantly associated with wealth depletion in married households, increasing the probability of a 10 or 50 percent depletion in wealth by about 6 percent. Smith (1999) utilizes interperiod changes in various

measures of wealth and the onset of a serious health event among individuals in the Health and Retirement Study (HRS). Smith reports that the onset of a mild to severe chronic health condition such as cancer depletes wealth by as much as $40,000 across five waves of the study or about 10 years. Families in the HRS are often forced to turn to non-liquid sources of wealth, including home equity, to cover health costs. These health shocks also lead individuals to revise their expectations of how long they will live and whether they will leave large inheritances.

Prior research on wealth accumulation assumes that health selection affects wealth only within a generation. However, health selection may also operate across generations as well. Economic analyses suggest anywhere from 20 to 80 percent of wealth comes from intergenerational transfers (Kotlikoff & Summers, 1981; Modigliani, 1988). Intergenerational transfers consist of both bequests and *inter vivos* transfers. However, *inter vivos* transfers constitute an estimated 43 percent of transfers whereas bequests are an estimated 31 percent of all transfers (Gale & Scholz, 1994). Since *inter vivos* transfers play an important role in wealth accumulation, non-fatal health shocks in previous generations clearly may affect the wealth of later generations. The dual context of declining health in later life and taxes on bequests to children upon the death of a parent provides further impetus for a health selection effect on intergenerational transfers. There is evidence, for instance, that increased estate taxes lead to a 10 percent decline in bequests to children (Joulfaian, 2006). Moreover, individuals decrease financial risk in their investment portfolios if they perceive increased risk of poor future health (Edwards, 2008). This suggests that individuals may alter their financial transfers to children if they perceive a risk of poor future health, indicated by a health shock, much as they do with their investment portfolios and to avoid estate taxes.

USING LIFE COURSE THEORY TO UNDERSTAND INTERGENERATIONAL HEALTH SELECTION

Life course theory in sociology provides a useful framework for studying intergenerational health selection because it highlights links, financial or otherwise, between the lives of individuals and their families. Hareven (1978) defines the focus of life course theory as the interrelationships between an individual and family members as they change across time and historical conditions. Individuals progress through a series of transitions in the life course in multiform ways, and the lives of family members are intricately linked in "family time" via these transitions and their effects on family members' interrelationships (Hareven, 1978; Elder 1994). Research using a life course perspective typically highlights developmental transitions associated with demographic dynamics of a population such as marriage, leaving the natal household, having a child, or entering the full-time labor market (Elder, 1994). Life transitions, however, can be *any* change in status including changes in health status. In the context of life course theory, a serious health shock can be understood as a health transition, potentially signaling a shift in the general health status of an individual and/or entry into old age. Given the intricate links among family members' lives and changes in these links as family members complete various transitions in their life course, a health transition in a parent's life likely has implications for the child's life as well. The changing link between the lives of parents and their children induced by a parent's health transition is most clearly seen in the literature on upstream intergenerational transfers to parents *from* their adult children, which demonstrates an increase in the personal care and support adult children provide to their parents as parents approach old age and their morbidity increases (Bianchi, Hotz, McGarry, & Seltzer, 2006).

A life course framework also highlights the importance of differences in individuals' response to life transitions. For example, Elder (1994) notes that life course theory positions individuals as actively choosing among options available to them, options that inherently depend on their life course and its contexts. He notes, "Individual differences clearly matter in this research, particularly as they interact with changing environments to produce behavioral outcomes" (p. 6). Therefore, one may expect to see individual differences in reactions to life transitions including health transitions. In the present analysis, then, life course theory suggests that parents may alter their financial transfer behavior differently following a serious health shock depending on their social and economic circumstances. Research elsewhere suggests individuals make choices differently based on initial socioeconomic status (Goldthorpe, 1996), an idea typically applied to education and labor market processes but which may apply to financial transfer behavior as well. Following this evidence within the parameters of a life course framework, one might expect parents with less initial wealth to respond differently to a serious health shock than parents with more initial wealth. Life course theory does not tell us whether low (or high) wealth individuals will increase (or decrease) financial transfers to children in the face of a serious health event. One can imagine any number of plausible scenarios *a priori* that life course theory is not helpful in sorting out. For example, a health shock may lead an individual with less initial wealth to decrease financial transfers to children in order to preserve remaining levels of wealth, while, under similar circumstances, an individual with more initial wealth may maintain or even increase financial transfers because she has the resources to do so. Conversely, an individual with less wealth may continue financial transfers, in part because he is already transferring no more than minimal amounts of wealth to his children, while an individual with more initial wealth may reduce transfers to children following

a serious health event in order to hedge against future financial risk arising from increased medical care costs.

Given this weakness of life course theory, we proceed inductively in our assessment of potential differential effects of health selection in intergenerational financial transfers. We simply ask whether a serious health event affects intergenerational financial transfers and whether this effect differs by initial socioeconomic status, specifically, the parent's level of wealth prior to the onset of a serious health event. We take our results to be indicative of more general processes rather than an exhaustive or definitive test of the causal relationships characterizing health selection in intergenerational financial transfers given the exploratory nature of our analyses.

DATA AND METHODS

We use data from the Wisconsin Longitudinal Study (WLS). The WLS is based on a random one-third sample of 1957 Wisconsin high school seniors originally surveyed to assess the demand for post-secondary schooling in the state. A total of 10,317 individuals were included in the original WLS sample (5,325 women and 4,992 men). Data were primarily collected in five waves in 1957, 1964, 1975, 1993, and 2004. These data are particularly suitable for the analyses of health-wealth differentials. Graduates are about 65 years of age in the most recent wave of the study in 2004, and previous health, wealth, and intertransfer measures were ascertained in 1993 when graduates were about 54 years of age. Therefore, the study spans ages when socioeconomic status and health differentials tend to be largest (House, Lepowski, Kinney, Mero, Kessler, & Herzog, 1994) and when many individuals experience declines in their health, including the onset of serious health conditions such as cancer or heart disease. Moreover,

previous research has found that the likelihood of making financial transfers to children increases with the age of the parents until sometime in midlife and then subsequently declines (Kronebusch & Schlesinger, 1994). Thus, the fourth and fifth waves of the WLS cover a time period in which many *inter vivos* financial transfers are made to children.

There are several other advantageous, general features of our data. The WLS has high response rates and spans a 50-year period. Consequently, one can control for a wider variety of social background and individual characteristics as well as extensive health status measures within a wider window of observation than in temporally or substantively narrower studies. Moreover, this cohort immediately pre-dates the Baby Boom cohort and provides a unique opportunity to explore some of the issues Baby Boomers are facing.

However, there are also limitations to our data. The WLS graduate sample is not nationally representative of the U.S. and only includes individuals who have at least a high school diploma. Thus, our results are subject to bias given the observed relationship between educational attainment, health, and wealth. On the other hand, asset accumulation is considerably lower among high school dropouts, so our sample of individuals with at least a high school diploma still likely captures important health selection processes in wealth. Moreover, we consider the health and wealth of graduates' spouses, many of whom are not high school graduates. For the sake of argument, however, we consider whether or not results from the WLS are comparable to previous research on health selection in *intra*-generational wealth accumulation using U.S. national data in the first part of our analysis. We detail these findings below but generally find striking similiarity between the WLS and national longitudinal studies in the effects of a serious health event on subsequent levels of wealth. Thus, while the WLS has

some limitations, it still likely captures important effects of health selection on wealth accumulation as well as other, national data sets.

For all of our analyses, we limit the sample to white individuals who participated fully in the 1957, 1993, and 2004 waves of the study (N = 5,445). Because we are primarily interested in the effect of new health conditions between the fourth wave of the study in 1993 and the fifth wave in 2004, we drop cases with missing information on measures of health events. We also limit our sample to those with surviving children to whom graduates could transfer wealth (N = 4,422).[3] In the analytic sample, we use multiple imputation to address item non-response on all remaining independent variables.

Dependent Variables

We employ three dependent variables in our analytic models: non-pension wealth in 2004, whether individuals made an *inter vivos* transfer to children between 1993 and 2004, and the total amount transferred to children between 1993 and 2004. Both continuous dependent variables are measured in 2004 dollars. We define wealth as net worth or total assets less total liabilities including home equity, business or farm equity, other real estate equity, vehicle equity, and non-pension based net financial assets.[4] We impute missing net worth measures using a regression method similar to that used by the HRS and based on non-ignorable missing data patterns (Ruel & Hauser, 2005). Very few individuals have negative net worth in 1993 or 2004, but those who do are given a zero value. Net worth is top coded at 3 standard deviations above the mean, and we analyze its natural log with a starting value of $5,000, i.e., ln(net worth + 5000). This transformation is intended to create symmetry (reduce both positive and negative

skew) in the distribution of net worth, and effects on the transformed variable can be interpreted as proportional changes in net worth.

In the 2004 survey, graduates were asked if they made any transfers since 1993, and, if so, whether any of those transfers were made to their children. We create a dummy variable denoting whether graduates made a transfer(s) to their children since 1993 using this information. This dependent variable represents a special challenge in our analysis due to a lack of information on the timing of transfers to children. Since transfers could have occurred before and/or after a health shock, it is impossible to precisely distinguish the exact causal direction of the relationship observed between intergenerational transfers and health shocks. However, most health events occurred in the first few years after 1993. So long as financial transfers occurred throughout or, even better, towards the end of the 11-year period between 1993 and 2004, endogeneity becomes less of an issue though we cannot completely dismiss it.[5] For those who made a transfer, we calculate the total amount of transfers to all children since 1993—our third dependent variable. This measure is constructed similar to our measure of net worth, but now we use a starting value of $1,000 before taking the natural log.

Independent Variables

In this analysis, we are primarily interested in the effect of the onset of a severe health event between 1993 and 2004 when graduates were approximately ages 54 and 65. To this end, we use a dummy variable denoting whether the graduate experienced a heart attack, cancer, stroke, diabetes, or a limiting disability since 1993. Following previous research, we also create an equivalent dummy variable for the graduate's spouse since a serious health event for either family member could both have repercussions on wealth accumulation.[6] The study includes self-

reports of health events for a random 50 percent sample of spouses. Rather than limit our analysis to the 50 percent subsample, we multiply impute spouses' health events, assuming that the data are missing completely at random. In all analyses, we include a dummy flag variable for imputed spouse health events.[7] We also follow previous research by defining a serious health condition as a heart attack, cancer, stroke, diabetes, or limiting disability. We treat a disability as a serious health condition if it limited the individual's ability to do things either on or off the job.[8,9] We think of this serious health event or shock as indicative of a health transition in the lives of graduates and their spouses, a transition that may have implications for *inter vivos* financial transfers to their children.

In the analysis, we control for a number of graduates' and spouses' characteristics associated with wealth accumulation and health. We first include dummy measures of whether the WLS high school graduate is female and a better financial reporter than her or his spouse, making male graduates who are not the better financial reporters the omitted category. Following previous research, we include a dummy variable for the self-rated health of the graduate in 1993 and a dummy variable for graduate's report of the overall health of the spouse in 1993 in order to control for adult health prior to the onset of a health event between 1993 and 2004. For all subjective health status measures, we use a dummy measure denoting whether or not the health of the individual in question was fair, poor, or very poor in 1993.

We include extensive controls for graduates' and spouses' socioeconomic and individual characteristics in 1993 at the beginning of the 11-year period of observation. We measure education in 1993 for both the graduate and the spouse as years of attained education. Marital disruptions have been shown to adversely affect wealth accumulation so we include a dummy variable for those married more than once (Wilmoth & Koso, 2002). A dummy variable for

those not currently married—a very small group—consists of those who were widowed, divorced/separated or never married in 1993. Finally, to control for possible decreases in wealth due to marital dissolution, we include a dummy variable for graduates who were married in 1993 but were no longer married in 2004. The reference category and largest group are those 1957 Wisconsin high school graduates still married to their first and only spouse in 2004. We measure graduates' family size by the number of living children they reported in 1993, top coded at seven or more.

We use Duncan's (1961) occupational socioeconomic index (SEI), divided by 10 for convenience in the presentation of estimates to represent occupational status of the graduate's and the spouse's current or last job in 1993. We also include dummy measures of whether the graduate or spouse was self-employed in 1993 and whether the graduate or spouse was working in 1993 and/or retired in 1993. Many graduates considered themselves retired from a career or long-term job but continued to work at another job, so we enter controls for both into the model. We enter a dummy variable for whether the graduate or spouse holds a pension plan in 1993. We also control for logged household income in 1993, transfers and inheritances received since 1993, and net worth in 1993 (all measured in 2004 dollars). Finally, we include measures of private health insurance coverage by the graduate or spouse in 1993 and change in health insurance status by 2004.[9]

We also consider the graduates' childhood and adolescent circumstances in models reported here.[10] Early life conditions may be related to the onset of disease independent of adult health status (Barker, 1998; Palloni, 2006) and may subsequently alter the estimated effect of a health shock. We include a count of serious illnesses each graduate had prior to age 16 which is top coded at three to reduce skew in the distribution. We also control for graduates' social

origins with five distinct measures: whether the graduate hails from a farm background (Sewell, Haller, & Portes, 1969); whether the graduate lived with both parents at the age of 16; the total number of siblings (top-coded at 9); and a socioeconomic status index based on the graduate's origin family income, the origin household head's occupation, and each parent's education when graduates were in their last year of high school (Sewell et al., 1969). Research elsewhere suggests cognitive ability is related to overall health so we control for it here (Gottfredson, 2004; Link, Phelan, Miech, & Westin 2008). We use a normalized measure of cognitive ability (IQ) taken in the junior year of high school (Henmon & Nelson, 1946; 1954). We divide this variable by 10. Means and standard deviations for all variables in the analysis can be found in Table 1.

Insert Table 1 about here.

Model Specification

In our analyses, we employ OLS, tobit, and logistic regression models. The general regression model can be written as:

$$Y = \beta_0 + \mathbf{X\beta} + u \qquad (1)$$

where **X** represents a vector of sequentially entered measures described above. In our replication of previous research on *intra*generational health selection, we use a standard OLS regression as others have done. We prefer a logistic regression model for our discrete measure of whether or not a financial transfer was made to a child by the end of our 11-year period of observation. We use a tobit regression model for our continuous measure of amount of transfers to children in the 11-year period. We prefer the tobit model in this case due to left-censoring of individuals who did not make any financial transfer to their children in the 11-year period of observation and

right-censoring of individuals who transferred vast amounts of money (three standard deviations or more) to their children in the 11-year period. In all models, we employ post-sampling weights to correct for bias in non-response over time in the WLS. In the first model, we estimate the effect of a health event on a given dependent variable net of the graduate's gender and whether or not she or he is the better financial reporter. In a second model we add family and SES controls in later adulthood from 1993 and 2004, including controls for the graduate's and the spouse's baseline health in 1993. Model 3 adds a measure of the graduate's childhood health, and Model 4 adds controls for the graduate's social origin, including adolescent cognitive ability. We repeat this series of models for each dependent variable. For intergenerational financial transfer measures, we estimate models separately for individuals at or above median wealth in 1993 and individuals below median wealth in 1993. This specification allows for differences in slopes across the distribution of 1993 wealth and explicitly addresses the possibility that there are individual differences in the intergenerational effects of parents' health transitions. These models are described in Table 2.

Insert Table 2 about here.

FINDINGS

Intragenerational Health Selection in Wealth: Replicating Previous Research

We first present results from analyses replicating previous research on intragenerational health selection. The purpose of these analyses is to establish the reliability and generalizability of our sample relative to previous research using national panel studies. Table 3 presents

estimates of the effect of a graduate's or spouse's serious health event on levels of wealth in 2004.

Insert Table 3 about here.

Model 1 presents the effects of a graduate's and spouse's health shock on net worth conditional only on gender and whether or not the graduate claims to be the better financial reporter. In this model, we see that a health shock for both the graduate and the spouse is significantly associated with lower accumulated net worth in 2004. The observed difference in estimates of the effect of the graduate's and the spouse's health shock is not significantly different. Model 2 includes controls for 1993 baseline measures and pertinent changes between 1993 and 2004. Among other things, this model controls for the graduates' and the spouses' adult health status and net worth prior to a health event. This model closely mirrors those typically employed in the extant literature on health selection in wealth. As one would expect based on prior research, we find a graduate's health event between 1993 and 2004 is associated with lower levels of wealth in 2004 (13.7 percent in Model 2). The effect of a spouse's health shock is significant only at the 0.10-level in the same model. Looking at the effects of a graduate's and a spouse's health shock across Table 3, we see the effect of a graduate's health shock is only slightly attenuated in the full model (Model 4). In this model, the effect of a graduate's serious health event still leads to about a 13.3 percent decline in wealth on average, about a $51,810 difference. If we use the same metric as Smith (1999)—1996 dollars, this is $43,175 after adjusting for inflation, a figure that is remarkably similar to the estimated $40,000 decline in wealth over a ten-year period in the Health and Retirement Study that Smith (1999) observed. Thus, our results in the case of a graduate's health is nearly identical to research using

national panel data. The effect of a spouse's serious health event is significant only at the .10-level in the full model (Model 4), but it is still moderately large.

Intergenerational Health Selection in Wealth: Intertransfers to Children since 1993

Having essentially replicated an important finding of the extant literature on intragenerational health selection in wealth and thus provided support for the comparability of our data, we examine health selection effects across generations. In this section we ask, does a parent's health shock affect financial transfers to children? Table 4 presents logistic regression models of the likelihood of making a transfer to children between 1993 and 2004 by parents' initial levels of wealth in 1993. Specifically, we estimate models separately for graduates and spouses with wealth at or above the sample median in 1993 and for graduates and spouses with wealth below the median in 1993.

Insert Table 4 here.

Model 1 shows no significant association between the onset of a health event for the graduates or their spouses with making an *inter vivos* transfer to children, regardless of initial levels of wealth in 1993. However, after controlling for graduates' and the spouses' initial adult health status, net worth, income, family characteristics in 1993 and prior to a health event as well as select 2004 measures (Model 2), we find that a graduate's health event significantly increases the probability of making a financial transfer to children by 36 percent among graduates with less than median wealth in 1993 ($\exp(.307) = 1.359$, $p < 0.05$). A graduate's health event is not associated with making a transfer for those with wealth at the median or above in 1993, and a spouse's health

event remains insignificant regardless of initial levels of wealth. Model 3 adds a retrospective count of the graduate's childhood illnesses, but estimated effects of graduates' and spouses' health events are virtually the same as in Model 2. Finally, Model 4 adds controls for graduates' social origins. The effect of a health event for graduates is only slightly attenuated among individuals with median or less wealth in 1993 in that model ($\exp(.293) = 1.340$, $p < 0.05$).

We next ask whether a parent's serious health event affects the amount of money transferred to children. We assess whether this effect varies by parents' levels of wealth in 1993 as before but now use a tobit regression model to correct for left and right-censoring on financial transfers to children. Table 5 presents model results for the logged total amount of transfers to children between 1993 and 2004. Model 1 shows no significant association between the onset of a serious health event for the graduates or their spouses and the dollar amount of *inter vivos* transfers, regardless of initial levels of wealth in 1993. However, once we add controls for the graduate and the spouse's initial health, wealth, and socio-demographic characteristics in 1993 in Model 2, we find a pattern similar to that found in discrete models of making a financial transfer to children. That is, a graduate's serious health shock is positively associated with the amount transferred to children; we observe about a 62 percent increase in the amount transferred to children among those with less than median wealth in 1993 ($\exp(.485)-1)=.624$, $p < 0.05$). The full model, Model 4, shows only a small attenuation of this effect among individuals with less than the median wealth in 1993 ($\exp(.466)-1=.594$, $p < 0.05$). Overall, a graduate's serious health event increases the likelihood of making a transfer to children *as well as* the dollar amount of that transfer. These effects only occur, however, for graduates with less than 1993 median wealth. Once again, we find no statistically significant effect of a spouse's serious health shock in either case and regardless of initial levels of wealth.

Insert Table 5 about here.

DISCUSSION AND CONCLUSION

Sociologists and other social scientists have taken an interest in the relationship between health and socioeconomic outcomes for some time (Kitagawa & Hauser, 1973). More recently, social scientists have documented unusually strong health selection in wealth relative to other socioeconomic outcomes. In that instance, the onset of a serious health condition leads to significant declines in wealth for an individual. These questions are of scientific and practical significance. Research on intergenerational health selection can illuminate the myriad ways in which important inequalities take root in general over time. In the context of our analysis on health selection in wealth, for example, understanding how health shocks may affect financial transfers across generations within a family can help illuminate both how poor individual health reaches beyond individual outcomes to affect other family members via individuals' spending, saving, and transfer behaviors.

We had two objectives in this paper. First, we sought to replicate an earlier body of research on intragenerational health selection using U.S. panel data in order to establish the reliability of our data. This earlier research has found health shocks in later adulthood decrease individuals' levels of wealth by a significant amount—roughly 10 percent or $40,000 in 1996 dollars. In models paralleling those used in previous research, we find a similar effect of a graduate's health shock (~$43,000). The striking similarity between our results and results from other research using U.S. national panel data suggests that while there are some notable limitations to our data, these limitations do not appear to markedly bias our results. We did not

find an effect of a spouse's health shock at the .05-level. However, this non-effect is perhaps partially predicated on less precise estimates of the effect of a spouse's health shock since this measure is based to an important extent on imputation.

The second and primary objective of the paper was to extend the study of health selection to include intergenerational processes of wealth accumulation. If health selection operates in wealth accumulation within a generation, it may also operate across generations. This is especially important given the importance of intergenerational financial transfers for wealth accumulation. Though the importance of the study of intergenerational health selection is clear, the literature has generally limited itself to the repercussions of health selection on the generation suffering from these health shocks. Yet, life course theory reminds us that individuals' lives are linked, composed of a series of transitions in their course and occurring in a given socio-historical context partially demarcated by the life transitions of those close to them. When the intergenerational effects of individual health transitions have been considered in the literature, consideration of them has largely been limited to the effects of an individual's old age and morbidity on the care and social support provided to him or her by his or her children (Bianchi, et al., 2006).

We found that a graduate's health shock had a strong and *positive* effect on the likelihood of making a transfer among those in the bottom half of the initial wealth distribution at the beginning of our 11-year period of observation. We observed no such effect for those in the top half of the 1993 wealth distribution. We also found no effect of a spouse's health event regardless of initial levels of wealth. Among graduates with less than median wealth in 1993, those experiencing a health shock were 34 percent *more* likely to make a financial transfer to their children net of a host of demographic, socioeconomic, and health controls. This is the first

evidence, to our knowledge, of the importance of health shocks in the previous generation for financial transfers to the next generation. Given the comparability between our *intra*generational health selection results and results from other national panel studies in the U.S., it seems likely this result will be observed with populations other than the white, pre-Baby Boom cohort of Wisconsin high school graduates and their spouses that we studied here.

The robustness of our results should, of course, be tested. If the intergenerational health selection effect we observe here proves robust, its exact implications should also be assessed. Given the average transfer to children is $3185 among graduates who have one or more children in our sample (see Table 1), it is questionable such an amount would lead to any significant and lasting financial benefits for the children. To put it a different way: intergenerational health selection in financial transfers likely occurs widely in the population, but its effects on the wealth of the next generation may be more modest than intragenerational health selection in wealth and therefore more comparable to other intragenerational health selection effects on socioeconomic status, social class, etc.

Moreover, our analysis does not speak to mechanisms of intergenerational health selection in financial transfers, mechanisms that may be difficult to flesh out. In supplementary analyses, we explored the possibility that individuals with less initial wealth who experience a health shock subsequently expect to live shorter lives and therefore transfer (more) money to their children. Subjective life expectancy is a potentially important though overlooked link in the path from health to wealth accumulation, particularly for intergenerational transfer behavior given the demonstrated importance of subjective life expectancy relative to observed mortality patterns and its association with socioeconomic status (Kerry Smith, Taylor, & Sloan, 2001;

Hurd & McGarry, 2002; Mirowsky & Ross, 2000). We found no evidence that subjective life expectancy is a mediator of health shocks on intergenerational financial transfers.

Extant research considers other underlying motivations for intergenerational financial transfers at length, though not in the context of health shocks, that may help explain the intergenerational health selection effects we observe in our data. Research in economics in particular considers whether parents make financial transfers to their children as a means of securing support and personal care from their children or as completely altruistic gifts intended to enhance their children's well-being (Cox & Rank, 1992; Gale & Scholz, 1994; McGarry & Schoeni, 1995). Findings are mixed as to whether parents make financial transfers to their children under a social exchange or altruistic model (McGarry & Schoeni, 1995; Norton & Van Houtven, 2008). It is possible that the effect of a health shock on less wealthy individuals' financial transfers to their children that we observe is similarly motivated by altruistic and/or social exchange motives, but we have not explored these mechanisms to date. Given the modest average amount individuals transfer to their children on average in our sample (~$3200), it seems more plausible that intergenerational financial transfers following a parent's health shock is a means of securing support, especially since we find this effect only among individuals with less initial wealth and presumably fewer financial resources to hire extra-familial support.

In summary, we have replicated and extended prior research on health selection effects on wealth. We find evidence of health selection both intragenerationally *and* intergenerationally—though only in the bottom half of the wealth distribution in the case of the latter. Critics would rightly point out the unique characteristics of our sample—a largely white cohort of high school graduates from Wisconsin—but we do not view these features of our sample as such a severe limitation as to dismiss our results. While we agree our sample has

characteristics that may limit conclusions drawn for, say, race-ethnic differences among the young elderly, we do not agree our results are wholly a function of our sample's unique characteristics. Our intragenerational health selection models closely reproduce findings from other research using nationally based samples. All the same, we think the finding that a health shock significantly increases the likelihood and amount of *inter vivos* financial transfers among less advantaged parents but not among more wealthy parents should also be cross-validated. In future work, we intend to explore this effect and its mechanisms and encourage others to do so as well.

NOTES

1. Intergenerational transfers include bequests made after the death of a parent and *inter vivos* transfers made while the parent is still living.
2. Health drift suggests health selection may create (growing) differences between individuals prior to the onset of poor health; health stunting posits an indirect effect of health on later socioeconomic status, that is, poor health early in life limits the resources an individual may accrue for achieving high socioeconomic status in adulthood.
3. The accumulation of wealth is not dependent on having children. Therefore we ran the net worth analyses on the full sample as well, and the associations between health events and net worth were virtually the same.
4. We first asked for an exact value of each asset. If the respondent could not or would not give us an exact amount in 2004, we asked for the value in a series of branched questions with a random starting point in the distribution of wealth. This bracketing technique substantially increases response rates, often by 10 to 30 percent (Chand and Gan, 2003; Hauser and Willis, 2005; Hurd, 1999; Hurd and Willard, 1998; van Soest and Hurd, 2003; Smith, 1997).
5. In the next wave of data collection in the WLS, we intend to collect information on the timing of financial transfers to children since the last wave of the survey in 2004.
6. Research on the intragenerational effects of health shocks in mid to late adulthood on wealth remains vigorous. More recent research focuses differences in the effects of a husband's and wife's health event on wealth accumulation and find evidence of the greater or later importance of a wife's health event (Wu, 2003; Michaud and van Soest, 2004). We found

no such gender difference though our intragenerational analyses replicate important findings from previous health selection in wealth research overall.

7. We also ran the analyses with complete spouse information only. The association between spouse's health event and net worth and *inter vivos* transfers is essentially unchanged.
8. In supplementary analyses, we evaluated whether our results differ markedly if we limited the health shock to heart attack or stroke, which have very immediate affects. These results are available upon request but generally support the conclusions we draw here.
9. The repercussions could be much worse if both the graduate and the graduate's spouse had serious health events at the same time. Therefore, we created an interaction between graduate and spouse's health events. The interaction was not significant in any of the models and is not included in the final results.
10. One might expect that having long term care insurance might make a large difference in whether parents make transfers of funds to their children. We do have a measure of long term care insurance but do not include it in the results presented here. It appears to be highly correlated with having health insurance and including long term care insurance in the regressions does not improve the models.
11. We model the role of family background for spouses in supplementary analyses. As these variables were only collected in 1975, we had to reduce our sample to those with spouses in 1975 that are still married to the 1975 spouse. In general, health selection is much smaller in this subset and after controlling for the full model, there is no health selection effect on wealth accumulation. These analyses are available on request.

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Table 1. Descriptive Statistics for WLS Graduates and Spouses (N=4422)

	Mean	Std. Dev.	Range
Dependent Variables			
2004 Log Net Worth	12.92	1.14	8.52-16.51
2004 Net Worth $	403399.00		
1993 Log Net Worth	12.30	1.24	8.52-16.16
1993 Net Worth $	214696.00		
2004 Transfers to Children	0.41	0.49	0-1
2004 Log Transfers to Children (Conditional)	9.01	0.79	8.52-11.49
2004 Transfers to Children $ (Conditional)	3185.00		
Independent Variables			
Graduate Health Event since 1993	0.19	0.39	0-1
since 1993btwn 1993 and 2004	0.22	0.42	0-1
Graduate Fair or Worse Health 1993	0.11	0.31	0-1
Spouse Fair or Worse Health 1993	0.11	0.31	0-1
Female	0.54	0.50	0-1
Graduate Best Financial Respondent	0.49	0.50	0-1
Graduate Years of Education	13.57	2.25	12-20
Spouse Years of Education	13.20	2.43	1-26
Graduate Married Once by 1993	0.73	0.44	0-1
Graduate Married 2+ by 1993	0.12	0.32	0-1
Graduate Not Married 1993	0.10	0.30	0-1
Graduate Not Married 2004	0.08	0.26	0-1
Number of Children	2.90	1.25	1-7
1993 Log Family Income	10.30	0.91	7.3-13.7
1993 Family Income $	28233.00		
Graduate Occupational Status 1993	5.01	2.22	.6-9.2
Spouse Occupational Status 1993	4.87	2.20	.2-9.6
Graduate Working 1993	0.85	0.35	0-1
Spouse Working 1993	0.72	0.45	0-1

Table 1. Continued on Next Page…..

Table 1. Continued…Descriptive Statistics for WLS Graduates and Spouses (N=4422)

	Mean	Std. Dev.	Range
Graduate or Spouse Self-Employed 1993	0.14	0.35	0-1
Graduate Retired 1993	0.11	0.32	0-1
Spouse Retired 1993	0.10	0.30	0-1
Graduate or Spouse Pension 1993	0.85	0.36	0-1
1993 Log Financial Transfers Received	8.06	1.76	6.9-15.3
1993 Financial Transfers Received $	2165.00		
Graduate Health Insurance 1993	0.91	0.29	0-1
Graduate No Health Insurance 2004	0.34	0.47	0-1
Graduate Health Insurance 2004	0.05	0.21	0-1
Graduate No. Child Illnesses	0.61	0.79	0-3
Graduate Intact Origin Family	0.90	0.30	0-1
Graduate No. Siblings	3.23	2.32	0-9
Graduate Farm Origin	0.25	0.43	0-1
Graduate Origin Family SES	3.14	0.56	1-5
Graduate Adolescent Cognitive Ability	10.12	1.45	6.1-14.5

Note: We refer to the 1957 Wisconsin high school graduates who are our main respondents as "graduate." We refer to their spouses as "spouse."

Table 2. Model Description for 2004 Wealth and Financial Transfers

Model 1	Graduate and Spouse Serious Health Event
Model 2	M1 + 1993 Graduate and Spouse Health and Socioeconomic Characteristics and 2004 Health Insurance Status
Model 3	M2 + Number of Graduate Childhood Illnesses
Model 4	M3 + Graduate Social Origins

Table 3. Effect of a Graduate's and Spouse's Serious Health Event on 2004 Wealth (N=4422)

	Model 1	Model 2	Model 3	Model 4
Intercept	13.376***	12.867***	12.883***	12.884***
	(0.03)	(0.09)	(0.09)	(0.1)
Graduate Serious Health Event Since 1993	-0.259***	-0.147***	-0.146***	-0.141***
	(0.04)	(0.04)	(0.04)	(0.04)
Spouse Serious Health Event Since 1993	-0.203**	-0.103+	-0.102+	-0.099+
	(0.05)	(0.05)	(0.06)	(0.05)
Graduate Fair or Worse Health 1993		-.282***	-0.225***	-0.218***
		(0.05)	(0.05)	(0.05)
Spouse Fair or Worse Health 1993		-.238***	-0.248***	-0.247***
		(0.05)	(0.05)	(0.05)
R-Squared	0.07	0.44	0.44	0.45

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 4. Effect of a Graduate's and Spouse's Serious Health Event on Making a Financial Transfer to Children 1993-2004 by Graduate and Spouse's Median 1993 Wealth (N=4422)

	Model 1		Model 2		Model 3		Model 4	
	Below Median	At or Above Median	Below Median	At or Above Median	Below Median	At or Above Median	Below Median	At or Above Median
Intercept	-0.766***	.061	-1.317**	-.482	-1.330**	-.507	-1.065*	-.502
	(0.10)	(0.09)	(0.39)	(0.34)	(0.39)	(0.34)	(0.42)	(0.38)
Graduate Serious Health Event	.182	-0.145	.307*	-0.078	.304*	-.076	.293*	-.084
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Spouse Serious Health Event	-0.086	-0.014	-.042	-0.028	-.043	.027	-.062	.025
	(0.17)	(0.11)	(0.17)	(0.13)	(0.17)	(0.13)	(0.13)	(0.14)
Graduate Fair or Worse Health 1993			-0.298+	-0.216	-0.307+	-.226	-.308+	-0.205
			(0.16)	(0.17)	(0.16)	(0.17)	(0.16)	(0.17)
Spouse Fair or Worse Health 1993			-0.120	-0.028	-.121	.023	-.121	.038
			(0.17)	(0.21)	(0.17)	(0.21)	(0.17)	(0.22)
R-Squared	0.005	0.006	0.07	0.11	0.07	0.11	0.07	0.11

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 5. Effect of a Graduate's and Spouse's Serious Health Event on Amount of Financial Transfers to Children 1993-2004 by Graduate and Spouse's Median 1993 Wealth (N=4,422)

	Model 1		Model 2		Model 3		Model 4	
	Below Median	At or Above Median	Below Median	At or Above Median	Below Median	At or Above Median	Below Median	At or Above Median
Intecept	5.685***	9.317***	5.005***	8.997***	4.988***	8.995***	5.356***	9.042***
	(0.16)	(0.08)	(0.58)	(0.15)	(0.58)	(0.15)	(0.63)	(0.16)
Graduate Serious Health Event	0.302	-0.054	0.485**	-0.015	0.482**	-0.015	0.466**	-0.018
	(0.19)	(0.05)	(0.18)	(0.05)	(0.18)	(0.05)	(0.18)	(0.05)
Spouse Serious Health Event	-0.106	-0.051	-0.030	-0.031	-0.031	-0.031	-0.058	-0.035
	(0.25)	(0.06)	(0.23)	(0.06)	(0.23)	(0.06)	(0.23)	(0.06)
Graduate Fair or Worse Health 1993			-0.419+	-0.081	-.426+	-0.082	-.440+	-0.069
			(0.24)	(0.08)	(0.24)	(0.08)	(0.24)	(0.08)
Spouse Fair or Worse Health 1993			-0.115	-0.026	-0.115	-0.026	-0.118	-0.026
			(0.25)	(0.08)	(0.25)	(0.08)	(0.25)	(0.08)
Sigma	2.861***	0.943***	2.704***	0.865***	2.704***	0.865***	2.693***	0.862***
	(0.1)	(0.01)	(0.09)	(0.01)	(0.09)	(0.01)	(0.09)	(0.01)
AIC	4674	6163	4574	5820	4575	5830	4575	5797

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

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