Federal Reserve Bank of Chicago

Intergenerational Mobility in Self-Reported Health Status in the US

Timothy Halliday, Bhashkar Mazumder, and Ashley Wong

REVISED
July 2020

WP 2018-02

Intergenerational Mobility in Self-Reported Health Status in the US

Timothy Halliday
University of Hawaii, Manoa and IZA
halliday@hawaii.edu

Bhashkar Mazumder
Federal Reserve Bank of Chicago and University of Bergen
bhash.mazumder@gmail.com

Ashley Wong
Northwestern University
ashley.wong816@gmail.com

July 2020

Abstract: We present estimates of intergenerational mobility in self-reported health status (SRHS) in the US using data from the PSID. We estimate that the rank-rank slope in SRHS is 0.26. We show that including both parent health and income in models of intergenerational mobility increases the explanatory power of child outcomes. We construct a monetary metric for health and then use this to combine income and health into a measure of welfare and estimate the rank-rank slope to be about 0.4 for this new measure. Finally, we document striking health mobility gaps by race, region and parent education.

*We thank participants at workshops at the Federal Reserve Bank of Chicago, University of Queensland, University of Sydney, Labor and Econometric Workshop at Australian National University, the Australian Departments of Labor and Social Services, the Health and Development Conference, Academia Sinica, Taiwan, the PSID conference on Life Courses Influences at the University of Michigan, University of Toronto, Lund University, University of Bergen, the NBER Children's and Education workshop and the University of Kentucky. We also thank Aastha Rajan and Summers Askew for excellent research assistance. We wish to acknowledge funding from the National Institute on Aging (P01 AG029409). The views do not reflect those of the Federal Reserve Bank of Chicago or the Federal reserve system.

1. Introduction

A large and growing multi-disciplinary literature on intergenerational mobility has emerged in recent decades primarily motivated by concerns over equality of opportunity. Most of these studies have focused on income, education or occupation. However, one key aspect of socioeconomic status, general health status, has been relatively under-studied.[1] This is unfortunate since health is an especially important component of welfare (Jones and Klenow, 2016). For example, longevity, which depends in large part on health, is clearly a powerful barometer of lifetime utility. A large literature has also highlighted how poor health early in life leads to reduced educational attainment, worse labor market outcomes, and onset of chronic disease later in life (e.g. Case et al., 2005; Aizer and Currie, 2014). In addition, health, especially at later ages is fundamental for decisions related to work, retirement, consumption, and savings (e.g. Rust and Phelan, 1997; Palumbo, 1999; French and Jones, 2017).

Studying intergenerational mobility with respect to overall health status, however, is a formidable task. First, it requires panel data containing broad-based health measures for adults in two generations, which is difficult to obtain. Second, since the concept of interest is *latent*, health is inherently difficult to measure. Morbidity measures or anthropometric indicators such as height, weight and BMI are typically blunt proxies for a more fundamental underlying latent variable. Third, long-run latent health status might not be revealed until relatively later in life when variability in organ function becomes more pronounced (Steves et al., 2012), chronic diseases begin to emerge, and functional abilities increasingly become impaired.

We address these issues by using the Panel Study of Income Dynamics (PSID). The PSID is the world's longest running longitudinal dataset. It tracks individuals as they

[1] Previous intergenerational studies of broad-based health include Pascual and Cantarero (2009) and Kim et al. (2015). Work subsequent to ours include Anderson (2019), Fletcher and Jajtner (2019) and Graeber (2020). A large number of studies have looked at intergenerational associations in specific health outcomes (e.g. height, body mass index, birth weight, asthma). We discuss the prior literature in section 2.

form new households and has been widely used to study intergenerational mobility.[2] Since 1984, the PSID began collecting information on self-reported health status (SRHS). SRHS has long been established in the epidemiology literature as a valid omnibus health measure that is highly predictive of mortality, even when compared to clinical measures such as chronic illnesses (e.g. Miilunpalo et al. 1997, Idler and Benyamini, 1997 and DeSalvo et al. 2005). SRHS has specifically been validated in the PSID using proprietary mortality files, where the measure predicts mortality even after controlling for baseline demographic characteristics (Halliday, 2014). Importantly, to our knowledge, the PSID has collected data on SRHS for longer than any other longitudinal dataset.

We construct an intergenerational sample of parents and their adult children using all available information on health status when individuals are at least 30 years old. We employ a method used by the National Center for Health Statistics to convert SRHS to a continuous measure that is akin to a quality adjusted life year or "QALY" (see Erickson et al. 1995).[3] Following the income mobility literature, we use time averages of the QALY to proxy for lifetime health status. We view time averaging as a method for extracting a time invariant latent variable. The use of health reports at multiple points in time, and at different points of the lifecycle, enables us to overcome the key obstacles to studying intergenerational health mobility.

Our first mobility measure is the Intergenerational Health Association (IHA), which is the coefficient on parent health status from a regression of child health on parent health (adjusting for age). This provides a measure of the persistence in health status that is similar to the intergenerational income elasticity. We also construct a variety of rank-based measures and run intergenerational "rank-rank" regressions as popularized by Chetty et al (2014). We estimate the slope of this regression, the "rank-rank slope," as well as measures of the expected rank for a child whose parents were at the 25th and 75th percentiles of the parent health distribution to provide estimates of upward and downward mobility.

[2] See Mazumder (2018) for a review of studies of intergenerational mobility using the PSID
[3] We follow the methodology employed by Johnson and Schoeni (2011) in their paper. Additional details provided in Section 2.

Our estimates of the IHA range from 0.20 to 0.25 with a preferred estimate of 0.23 when we pool men and women and combine both parents. This implies that an additional year of quality life among parents is associated with close to three additional months of healthy life for children. This suggests that there is a modest degree of persistence in health status in the US. We estimate the rank-rank slope (Spearman correlation) to be between 0.21 to 0.29 with a preferred estimate of 0.26. We further find that the expected rank of children starting at the 25th percentile is about the 44th percentile suggesting considerable upward mobility. The expected rank of children starting at the 75th percentile is the 57th percentile which also suggests that there is considerable downward mobility. In a companion paper (Halliday et al., 2020), we obtain similar estimates for rank-based measures of intergenerational health mobility when using a more sophisticated model of latent health that we estimate via Bayesian methods. Our findings of an intergenerational association of around 0.2 is roughly consistent with estimates of intergenerational associations in birth weight, longevity and mental health which are also around 0.2.[4]

Although SRHS is highly validated and widely used, it is nonetheless a subjective measure. To address this concern, we combine a set of 21 more objective health measures (e.g. arthritis, heart disease, difficulty walking) that have been collected in the PSID since 1999 to construct an alternative health index (AHI). For a subset of our sample, we compare estimates using SRHS to those using the AHI. Remarkably, we find that the results are extremely similar, further confirming that SRHS appears to be a valid measure of intergenerational health mobility.[5]

We also consider how the joint distribution of income and health evolves over a generation. We do this by adding parent income rank to the regression of child health rank on parent health rank and by adding parent health rank to the regression of child income rank on parent income rank. We show that including both dimensions of socioeconomic

[4] See the next section where we review the literature.

[5] We also consider a variety of other measurement issues that have been the focus of the income mobility literature. For example, we show that estimates of intergenerational health persistence rise as we use more years of parent health and when we measure health when parents and children are aged 50 or higher. The latter finding is consistent with the notion that latent health status is not well captured until later in the life cycle when the variation in self-reported health status rises.

status of parents improves the explanatory power of these regressions, demonstrating the independent value of these measures.

Having established the independent importance of both income and health, we then create a monetary metric for health and then use this to combine income and health into one overall measure of welfare. We show that the rank-rank slope in this combined measure is about 0.43 which is higher than the association in either measure taken on its own.

We also analyze heterogeneity in health mobility by race, region and parent education level using rank-rank regressions. We generally find that the same groups that are disadvantaged with respect to income mobility are also disadvantaged with respect to health mobility. We find that Blacks experience both lower upward mobility and higher downward mobility.[6] We also show that the gaps in expected health rank are even more pronounced when comparing individuals by their parents' education level. This suggests that the well-known gradient in health by education levels extends to the subsequent generation. We also find that those born in the South experience both lower upward mobility and higher downward mobility.

2. Literature Review

In this section, we discuss previous related work and how our paper fits with the current literature. A growing literature has examined intergenerational mobility with respects to various measures related to health. However, most of these papers focus on highly specific aspects of health status like anthropomorphic measures or specific health-related behaviors. In contrast, we are interested in a broader measure of overall health status that can be thought of as an aggregation of measures that reflect these specific components. There are only a few studies like ours, that examine an omnibus measure of health status.

Several studies have examined intergenerational persistence in birth weight (e.g. Currie and Morretti, 2007; Black et al. 2007; Giuntella et al., 2019) which could be thought of as a precursor to health later in life. These studies have typically found relatively modest

[6] Comparable studies of racial gaps in income mobility include: Hertz (2005), Bhattacharya and Mazumder (2011), Mazumder (2014), Davis and Mazumder (2018), and Chetty et al (2018).

intergenerational associations. For example, Currie and Morretti (2007) estimate that the intergenerational elasticity in birth weight is in the range of 0.17-0.20. Other work on anthropomorphic measures include Bhalotra and Rawlings (2013), Classen (2010) and Akbulut-Yaksel and Kugler (2016). Classen (2010) estimates an intergenerational correlation of around 0.35 in BMI. One notable study by Johnston et al. (2013) has examined mental health and estimates an intergenerational association in mental health that is between 0.13 and 0.19.

Other studies have estimated intergenerational transmission in health-related behaviors. For example, Loreiro et al. (2010), and Darden and Gilleskie (2016) have examined smoking and Schmidt and Tauchmann (2011) have analyzed alcohol consumption. These studies have also highlighted an important gender-specific transmission to engagement in health-related behaviors. This motivates our focus on also looking at gender differences.

Among studies that have used a broader measure of health many have focused on longevity. There is a rather old literature that has estimated intergenerational correlations in life spans (see Beeton and Pearson 1901, Ahlburg 1998, and Yashin and Iachine 1997, Lach et al., 2008, Hong and Park, 2016, Kaplanis, et al. 2018, for example). This literature tends to find intergenerational correlations on the order of 0.15-0.30. However, it is important to note that these estimates require observing the completed life spans of two generations, which is typically only feasible with very long running historical administrative data sets that are not often readily available to researchers. These estimates by their very nature may not be indicative of health transmission in the modern period or for more advanced economies.

While longevity is certainly a key component of human welfare, it is a relatively blunt measure and does not measure the quality of a person's health when they are alive. In contrast, health quality is often measured using quality adjusted life-years or QALY's. We estimate intergenerational persistence in a measure of QALY's derived from self-reported health status (SRHS).

Two papers written after ours, build on our methodology and estimate intergenerational persistence in QALY's.[7] Fletcher and Jajtner (2019) use the National Longitudinal Study of Adolescent to Adult Health or Add Health for the US and estimate the intergenerational health association (IHA) to be about 0.17. They also consider regional variation and heterogeneity by population subgroups. While Fletcher and Jajtner (2019) have a much a larger sample, their sample of adult children is considerably younger, and they use shorter time averages of health. As we discuss later in section 5.2, these aspects of measurement can attenuate the estimates. Graeber (2020) builds on our empirical approach and estimates intergenerational associations for Germany using the German Socio-Economic Panel. Graeber (2020) finds a rank-rank association of about 0.23, which is similar to what we find for the U.S. Graeber (2020) also considers nonlinearities and how associations differ based on family background.

Another recent paper by Andersen (2019) uses rich Danish administrative health records and a principal components analysis to estimate intergenerational health associations. Anderson estimates range from 0.1-0.2. An open question for future research is how comparable estimates based on administrative data are with those based on household surveys. An obvious advantage of administrative data is that it can avoid bias from self-reporting. However, administrative data on morbidities requires individuals to select into receiving care and there can be many institutional factors that can affect this propensity. In addition, collecting information on specific morbidities using ICD10 codes may not account for the severity of a given condition. For example, the severity of a diabetes or arthritis diagnosis may vary from person to person. In general, researchers must rely on measures that are based on administrative goals rather than questions that can be specifically tailored for research purposes such as activities of daily living. Another

[7] Coneus and Spiess (2012) also examine intergenerational associations in a number of health outcomes including SRHS but only to the first 3 years of life of children. Kim et al. (2015) use self-reported health data from Indonesia Family Life Survey and finds that having a father in poor health is associated with an increase of 0.29 in the probability of poor health for women. Pascual and Cantarero (2009) use self-reported health data from the European household panel and find sons with father in good or very good health are 5 to 10 percentages points more likely to be in good health. These papers do not use long time averages as we do.

advantage of survey data is that it enables us to show health mobility varies across population subgroups as administrative data often does not collect detailed demographic information such as race, ethnicity, or other aspects of family background.

Estimating intergenerational health mobility using QALY's based on SRHS also facilitates cross-national comparisons. The data on SRHS for two generations are available in countries such as the US, Germany, the United Kingdom and Indonesia. While studies have compared income mobility in different settings (e.g. Bratberg et al. 2017), we still know little about how health mobility varies across countries.

Finally, a separate strand of this literature has attempted to disentangle the roles of genetic and environmental factors in the intergenerational transmission of health. Thompson (2017) estimates the intergenerational persistence of asthma in the United States using data on adoptees and finds suggestive evidence that environmental factors play a relatively more important role in its transmission in poorer households. Bjorkegren, et al. (2019) use Swedish administrative data on adoptees to estimate intergenerational transmissions in life expectancy. They find most of the transmission takes place via biological parents. Notably, Classen and Thompson (2016) also found similar results for body mass index. This is another important area for future work that requires unique data.

3. Data

We use the Panel Study of Income Dynamics (PSID). The PSID is a U.S. longitudinal household survey that began in 1968 with a nationally representative sample of over 18,000 individuals living in 5,000 families. Including the original and subsequent samples, over 70,000 people have participated in the survey. Extensive information is collected on a wide range of outcomes including employment, income, wealth, childhood development, and education. Individuals in the PSID families and anyone subsequently born to or adopted by a sample person are followed over time even if they form separate family units. The unique design of the PSID allows us to link adult children to their parents across survey waves.

Starting in 1984, the PSID included questions on the health status of household heads and their spouses. Specifically, they asked, "Would you say your health in general is excellent, very good, good, fair, or poor?"[8] This question, commonly referred to as self-reported health status (SRHS), is highly predictive of mortality even after controlling for other health measures and outperforms other objective health measures (see Miilunpalo et al. 1997; Idler and Benyamini, 1997, DeSalvo et al. 2006, and Halliday, 2014). However, as a robustness check, we supplement our analysis by constructing an alternative health index (AHI) using 21 objective health measures available in survey years beginning in 1999. Details on the AHI are described in Section III and in Appendix B.

We construct a sample of 8,115 men and women who are at least 30 years old, provide SRHS in at least one survey year, and who are matched to at least one parent who also provides SRHS at least once.[9] We collect all values of SRHS between 1984 and 2013 for each person and, following Johnson and Schoeni (2011) who also used the PSID, convert the categorical values into a continuous measure using health utility-based scale developed for the Health and Activity Limitation Index (HALex). This approach is designed to estimate the percentage of a year that is considered to be of quality health, or a "quality adjusted life year" (QALY).[10] The value ranges for each health status category are as follows: excellent is [95,100]; very good is [85,95); good is [70,85); fair is [30,70); and poor is [1,30). We assign the midpoint of the interval for each reported health category in each year and then average these values over all available years for each individual.

---

[8] This question is now widely used in many U.S. surveys including the Current Population Survey, the Survey of Income and Program Participation, the National Health Interview Survey, and the Health and Retirement Survey.

[9] In our sample, 62% are matched to both parents, 33% to the mother only and 5% to the father only.

[10] The HALex for an individual is composed of two components: self-reported health status and activity limitation (such as limitations in activities for daily living). Because we only observe SRHS in the PSID, our scale is a less precise index than the HALex, but can be interpreted in the same way as the percentage of a year considered to be of "quality" health. Additional details for the construction of this scale and HALex can be found in Johnson and Schoeni (2011) and Erickson et al. (1995). Since the mapping of the SRHS to QALY is based on the 1990 National Health Interview Survey (NHIS) and our PSID sample covers the period from 1984 to 2013, we think the mapping is appropriate for our sample. As far as we are aware, the CDC has not produced an updated mapping of SRH to QALY.

There are several reasons we chose to convert the ordered SRHS variable into a QALY. First, it is not so straightforward to interpret intergenerational relationships in terms of the five ordered categories and there is no established tradition for this. In contrast, converting SRHS to a continuous measure allows us to use traditional methods such as regression to the mean and ranks to better convey the intergenerational dynamics in terms comparable to the previous literature. Second, the QALY measure itself is easy to interpret since it tells us the portion of a year spent in quality health which may be easier to understand than being in "good" health or very good" health. Third, in health economics there is tremendous value in quantifying the impacts of health in economic terms by converting health into a monetary metric which we can operationalize with the QALY. Fourth, using a QALY also allows us to combine income with health and pursue a more general welfare analysis that is in the spirit of Jones and Klenow (2016).

In Figure 1, we plot the mean health status over the life cycle pooling all individuals in both generations. The dashed lines indicate the +/- 1 standard deviation in health at each age. The figure shows that health is roughly flat from age 30 to 40 but then begins to decline roughly linearly through age 80.[11] To address this lifecycle pattern and in order to compare individuals at different ages we also construct a regression adjusted measure of health status.[12] Moreover, the widening of the standard deviation in health status at each age suggests that there is considerably more variation in health as an individual ages. This is consistent with greater variation in organ function (Steves et al. 2012) and the rising onset of chronic diseases at later ages. This suggests that health status is more indicative of latent health at age 60 than at age 40. It is also consistent with the well-known fact that inequality in general tends to increase as cohorts age. Deaton and Paxson (1994) provide evidence for consumption; Deaton and Paxson (1998) and Halliday (2011) provide evidence for numerous health measures including SRHS.

[11] After age 80 the samples are small and the estimates become noisy.
[12] We use the residual from a regression of the continuous health status on age and age squared using separate regressions for our samples of fathers, mothers, daughters and sons using sampling weights.

In addition, we collect data on total family income which includes all taxable income (e.g. earnings, interest and dividends) and cash transfers for all family members measured in 2013 dollars deflated using the CPI-U. We adjust for family size by dividing by the square root of the number of family members. We also average income over all available years. For race, we use the reported race of the child. To measure educational attainment, we use the last available report on years of completed education. Finally, region is based on the child's most often reported region of residence before the age of 18.

For our analysis of early life influences, we use a subsample of 3,281 adults in the 2013 PSID who were also part of the Childhood Retrospective Circumstance Study (CRCS). The CRCS collects data from household heads and spouses on their childhood and young adulthood experiences. Topics include parental relationship quality, childhood health, socioeconomic status, neighborhoods, friendships, school experiences, relationship quality with parents/guardians and young adult mentoring. For some categories we create indices by taking the largest component from a principal components analysis (PCA).[13]

In Table 1 we present summary statistics for our main sample (using sampling weights). Panel A shows the characteristics of parents. The mean age is around 56 and the average of years of education is between 12 and 13. Fewer than 10 percent report that their health is excellent. On average, our sample contains about 15 years of data on health status. Panel B shows that the children are on average 38 to 39 years old with about 14 years of education. Well over half report being in very good or excellent health.

In Panel C, we report summary statistics for the CRCS sample. We report the statistics for indices in standardized units.[14] We break down the CRCS childhood experience variables into the following categories: family socioeconomic background,

[13] Due to the discrete nature of the survey responses, we used the polychoric version of PCA as recommended by Kolenikov and Angeles (2009). Further details on the index construction can be found in Appendix A.
[14] Since the indices are constructed and standardized across the entire sample, the indices are on the same scale for both males and females and we can compare the means directly.

childhood health, childhood stability, school experience, and childhood relationships. See Appendix A for more detail.

4. Methodology

Intergenerational Health Association (IHA)

Many studies in the income mobility literature have estimated the intergenerational elasticity or "IGE". We start by creating an analogous measure, which we refer to as the intergenerational health association (IHA). The IHA is based on estimating the following regression:

$$y_{1i} = \alpha + \beta y_{0i} + \gamma \boldsymbol{X_i} + \varepsilon_i \tag{1}$$

where conceptually, y_{1i} represents the lifetime health of the child in family i, and y_{0i} is the lifetime health of one or both of the parents. The vector $\boldsymbol{X}$ is a set of controls and includes the quadratic age terms for both the parent(s) and the child. The parameter β provides a measure of intergenerational persistence and 1 - β is a measure of mobility. In our case, y measures the percentage of a healthy life year in which a value of 100 denotes one year in perfect health and 0 denotes a health state that is viewed as equivalent to death. If, for example, β is 0.2, this implies that if the difference in health between two families in the parent's generation was 10 percent of a healthy year, then we would expect the difference in health to be only about 2 percent of a healthy year in the children's generation. In this case, most health differences between families dissipate in a generation, so that the rate of regression to the mean is quite high. In contrast, if β is 0.8, we would consider health to be highly persistent so that there is low degree of mobility. Our preferred estimates combine the health status of both parents (when available) by using an average of the time averages of each parent and using just a single parent's health measure when only one parent is linked to a child. We also report gender-specific estimates because as noted in the literature review, previous studies on health-related behaviors showed a gender-specificity in the degree of intergenerational transmission. Standard errors are clustered by family.

Rank Mobility Measures

While the IHA, like the IGE, is useful for characterizing the rate of regression to the mean in one simple parameter, it is not ideal for all purposes. In particular, when comparing subgroups of the population (i.e. differences by race and region) relative to a common distribution, one may prefer to use rank-based measures (Mazumder, 2016). Rank-based measures are also better suited for distinguishing upward and downward mobility patterns. We calculate the percentile rank of age-adjusted health separately for each gender in each generation.[15] In addition to percentile ranks for each parent, we also construct a "both parents" measure that uses all available health observations from both parents and combines them into a single rank.[16] Similarly, we also construct an "all children" rank that pools together the age-adjusted child health measures for sons and daughters. We then estimate regressions[17] of the following form:

$$(2) \qquad r_{1i} = \alpha + \rho r_{0i} + \varepsilon_i$$

where r_1 and r_0 now represent the percentile rank of health in each respective generation. In this case, ρ provides an estimate of persistence in rank position and 1- ρ provides a measure of positional mobility. We will often refer to ρ, which is equivalent to the Spearman correlation as the "rank-rank slope." In principle, β and ρ can differ. It could be for example, that if the health distribution becomes more compressed in the child distribution than it was in the parent generation, then a given amount of rank mobility could be more consequential in terms of health as measured by years of quality life.

In addition to estimates of rank persistence, we use the rank-rank regression framework to calculate expected ranks at the 25th and 75th percentile. These estimates at

[15] We use sampling weights in estimating the ranks so that the percentiles correspond to positions in population.

[16] For this analysis, we pool the observations of mothers and fathers and regress the parent health measure on a quadratic in age interacted with parent type (mother or father), indicators for missing mother and father, and fraction of the parent health observations in that family that is from the mother. The age- and gender-adjusted parent health measure is the residual. We then take the percentile rank of this measure. The adjustment regression and percentile ranking are weighted using sampling weight of the mother. If mother's sampling weight is unavailable, then the father's sampling weight is used.

[17] The rank-rank regressions are weighted using the child's sampling weight and clustered at the family level.

"p25" and "p75" convey information about "directional" (upward or downward) mobility for a typical child coming from lower and higher health families.[18] For example, if the expected health rank of individuals coming from the 25th percentile is the 45th percentile then this would suggest upward mobility of about 20 percentiles.[19] We also construct a parallel set of income rank measures.[20] When analyzing subgroups (e.g. region, race, education), we calculate ranks based on the full population enabling us to make mobility comparisons with respect to the national distribution.[21]

Alternative Health Index (AHI)

As a robustness check, we develop an alternative health index (AHI) that is constructed from more objective health measures that are only available in survey years after 1999.[22] In total, we compile 21 indicators of adverse mental and physical health conditions that take on the value of 1 if the individual has the health condition and 0 otherwise. Details on the individual conditions can be found in Appendix B. We construct a simple index using the fraction of the conditions that the individual *does not* have so that a higher index value will indicate better health. We then take the time average of an age-

[18] Of course, using the intercept and slope one can easily calculate the expected rank at any percentile of interest.

[19] For some exercises, we divide the parent and children health distributions into quintiles and examine the fraction of children who escape the bottom (or top) quintile, i.e. children who are not in the bottom (or top) quintile conditioned on parent being the bottom (or top) quintile. We also look at the fraction of children who reach the top quintile conditioned on parent being in the bottom quintile and vice versa.

[20] We rank total family income in the same way as for health, by gender and generation, after performing the same age adjustment. We also construct a "both parents" income measure which is the average of all available average total family income associated with the mother and father. If the mother and father are in the same household, this average is merely the total family income of that year. We regress this measure on quadratic age terms of the mother and father, as well as indicators for having a missing father or mother. The corresponding income ranks are constructed from the residuals of this regression. Similarly, we also pool together age-adjusted income measures for sons and daughters to construct percentile ranks for all children.

[21] When we examine trends in the Appendix, parent and child age adjusted health ranks are estimated based on cohort specific joint distributions depending on the child's birth cohort. We use the following birth cohort groups: 1950-1959; 1960-1969; and 1970-1979 which comprise about 80% of our baseline sample.

[22] There were additional health variables available in 2001 or later but for purposes of consistency, we used all health indicators that were available in all years between 1999 and 2013.

adjusted AHI over all available years between 1999 and 2013 for each individual. We can then compare estimates of intergenerational health associations and rank-rank slopes based on the AHI to a similar set of estimates based on our health measure where we use the identical sample of individuals and restrict our SRHS data to reports from 1999-2013.

A Welfare Measure that Combines Income and Health

Finally, we construct a measure of welfare that combines both income and health into one overall measure of welfare.[23] In order to do this we first construct a monetary metric for health. We follow Finkelstein et al. (2019) who take the consensus value of a statistical life year to be $100,000 based on Cutler (2004). Therefore, our monetary metric of health assigns a value of $100,000 to each quality adjusted life year (QALY) in each generation. We then sum this value with our income measure to create our welfare measure. We then convert this to ranks and estimate a regression analogous to (2) using our combined measured. We also estimate a version of (1) using log of the combined measure of health and income.

5. Results

We first present our main estimates of intergenerational health mobility in Section 5.1. We then consider the robustness of these baseline results to measurement issues in Section 5.2. We next explore the joint distribution of health and income mobility in Section 5.3 and our combined welfare measure in Section 5.4. We then measure how health mobility differs across subgroups of the population in Section 5.5. In Section 5.6, we provide suggestive evidence on how health mobilty has evolved over the past decades. Finally, in Section 5.7, we consider potential mechanisms that can explain our results on intergenerational health mobility.

5.1 Intergenerational Health Mobility

Basic Descriptive Patterns

[23] We are grateful to Nathan Hendren for this suggestion.

Before presenting our main estimates, we start by showing some simple associations between parent and child health in Appendix Table A.1 that are easy to interpret. We convert the time averages of our continuous health measure for each individual back into the original five SRHS categories using the scale described in Section II. We find that if both parents (or one parent in the case of single parent families) are in at least good health, then children are 10.9 percentage points more likely to report being in at least good health compared to children whose parents were not in good health.[24] This differs somewhat by gender. Sons are 11.8 percentage points more like to be in good health when their parents are in good health compared to a 9.9 percentage estimate for daughters.

We explore this association along two further dimensions in Table 2. First, we separately examine the health associations of children with mothers versus fathers. Second, we investigate how associations differ among parents by different categories of the SRHS variable: good, very good and excellent health. We find that relative to having a mother in fair or poor health, having a mother in exactly good health increases the likelihood that a child will be in at least good health by 10.9 percentage points (column 1). Having a mother in very good or excellent health increases the association even further to about 16 percentage points. The estimates are fairly similar for sons and daughters as shown in columns (2) and (3). Columns 4 through 6 show the comparable estimates when we examine the estimates for fathers' health on all kids, sons, and daughters. Compared to mothers, there appears to be a slightly lower association between fathers and children.

Estimates of Intergenerational Health Mobility

In Table 3 we show the estimates of the intergenerational health association (IHA) for various parent-child groups. We find that when we combine both parents' health for the pooled sample of sons and daughters (column 1) we obtain an estimate of 0.23. In terms of years of quality life, the estimate implies that for every additional year of quality life the parents have, the child, on average, is expected to have almost three additional months (23% of a year) of healthy life. This is higher than either using only mother's health (0.20)

[24] See the notes under Table A.1 for more specific information on the specification.

or using father's health (0.17).[25] Note that the estimates that combine the health status of both parents necessarily take averages over a larger number of health measures. So, the estimates in the third row that combine both parents may be higher because they do a better job extracting the "signal" from the health measures of the parents. We find roughly similar patterns if we look either at sons (column 2) or daughters (column 3). Both sons and daughters' health are more strongly associated with mother's health than with father's health and the highest estimates arise when pooling both parents' health. The associations appear to be slightly higher from parents to daughters than sons.

In a companion paper, Halliday et al. (2020), we estimate a non-linear model of SRHS in which health is determined by a latent variable. Using Bayesian econometric techniques, we find somewhat higher estimates of the IHA. For example, when looking at the transmission from all parents to all children, we obtained an IHA of 0.29 (see Appendix Table A.2).

We next turn to estimates of rank mobility. In Figure 2A, we show the binned scatterplot of expected health rank at every percentile of the parent health distribution for all children in our sample. The relationship is almost linear. For every 10-percentile rank increase of the parents, the child is expected to be 2.61 percentiles higher in the health distribution of their own generation. In panel A of Table 4, we show estimates of the rank-rank slopes, expected rank at 25th and 75th percentile for all parent-child combinations. Estimates for the rank-rank slopes for the different subsamples range from 0.21 to 0.29. In our companion paper, Halliday et al. (2020) we found virtually identical rank-rank slopes when we directly modeled SRHS in a latent variable framework. Similar to the intergenerational health association results, we find the strongest association between mothers and daughters. We also find that the associations are larger when using mothers than when using fathers. Both sons and daughters have similar expected ranks when the mother (or father) is at the 25th percentile of the parent health distribution with estimates

[25] We also estimated the associations in logs so that our estimates are more directly comparable to estimates of the intergenerational income elasticity. The elasticity of both parents' health to both children is 0.18 (0.02). The elasticity using just mothers is 0.15 (0.02) and just fathers is 0.12 (0.02).

ranging from the 44th to the 47th percentile. Expected rank at the 75th percentile is also similar across the samples, ranging from 56 to 60th percentile, though, daughters appear to experience less downward mobility than sons.

Income mobility estimates for the identical samples are shown in panel B. The corresponding binned scatterplot for the full sample is shown in Figure 2B. The estimates for the rank-rank slopes range from 0.41 to 0.47, implying greater persistence in income rank than in health rank.[26] Comparing the estimates for the expected rank at p25 and p75 in panels A and B shows that there is less upward mobility from the bottom, and less downward mobility from the top, when using income compared to using health.

Alternative Health Index (AHI)

In Table 5, we compare mobility estimates based on self-reported health status (SRHS) to estimates based on the Alternative Health Index (AHI) using identical samples.[27] Whether we focus on the IHA or rank mobility estimates, we find that the estimates are remarkably similar across the two measures; we find no evidence of systematic downward bias in using SRHS which might have been expected if SRHS contained greater measurement error than the AHI. For example, the IHA estimates range from 0.091 to 0.199 when using SRHS and range from between 0.092 to 0.184 when using the AHI. Note that the estimates in this table tend to be lower than the estimates of health persistence in the previous two tables because they employ shorter averages of the health measures, which is a point that we will come back to shortly. This is not surprising given that we find that the two measures are highly correlated, with correlation coefficients ranging from 0.66 to 0.76 depending on the generation we use. Overall, this analysis

[26] These are higher than the rank-rank slope estimate produced by Chetty et al (2014) using administrative tax data but are consistent with estimates in Mazumder (2016) who also uses the PSID.
[27] Recall that for this analysis we limit our data to surveys after 1999. This leads to generally lower estimates than for our baseline sample due to differences in age and the length of time averages. Appendix Table A3 shows the summary statistics for this sample. For more details on the AHI, see Section 3 and Appendix B.

suggests that SRHS is at least as informative of latent health as measures based on questions about very specific health conditions.

5.2. Measurement Issues

Attenuation Biases and Time Averaging

Prior research has emphasized the importance of addressing measurement error/transitory shocks and lifecycle biases in producing accurate estimates of intergenerational associations in lifetime income (e.g. Jenkins, 1987; Solon, 1992; Mazumder, 2005; Grawe, 2006; Haider and Solon, 2006; Mazumder, 2016). Longer time averages of parent income have been shown to reduce attenuation bias. We analyze whether this is also the case in the context of health by following the same approach. In order to avoid having the composition of the sample change as we use longer-time averages, we hold the sample size fixed by requiring parents to report health in some minimum number of years (either 5, 7, 10 or 15 years). In all cases we keep the time average of the child's health measure fixed by using all available years.

The results for the rank-rank slopes of using longer time averages of parent health for daughters are shown in panels A and B of Figure 3 and the analogous figures for sons are shown in panels A and B Appendix Figure A7. We find that increasing the number of years in the time average of either the father or the mother leads to progressively higher estimates that plateaus once we have a time average of about 8 years. For example, in Panel A of Figure 3 when using the sample where mothers' health status was observed for at least 15 years, the estimates of the rank-rank slope between mothers and daughters increase from 0.21 to 0.31 as we increase the length of the time average from 1 year to 8 years. The increase is even larger when we examine the father-daughter relationship in Panel B, where the estimates increase from 0.17 to 0.29 over the same range. Although the attenuation bias appears to differ somewhat by parent-child combination, we find that time averaging is important for rank-rank slopes in health. This contrasts with the case of income where Mazumder (2016) and Nybom and Stuhler (2016) have found that rank-rank slopes are more robust to measurement error and transitory fluctuations.

In Appendix Figure A.6, panels A and B, we plot analogous graphs for the IHA where we estimate the models pooling sons and daughters. We see a similar pattern of rising estimates as we increase the length of parent time averages. When looking at the association between fathers and children in panel B of Figure A6, the increase in the IHA nearly doubles from 0.11 when using a single year of fathers' health to 0.20 when using a ten-year average (for the sample where fathers' health is observed for at least 15 years). These findings suggest that as is the case with income and occupation (Mazumder and Acosta, 2015) it is critical to use long time averages of health status to measure the IHA. These findings are also broadly consistent with the results in Halliday et al. (2020) which directly estimates the IHA using the categorical SRHS data in a latent variable econometric framework rather than first converting the SRHS to QALY and then using time averages.

Life Cycle Bias

We next consider how the estimates differ depending on the age at which health is measured. For each parent and child, we take an average of all available years in the following age bins: 30-39, 40-49, 50-59, and 60-69. For the rank-based estimates, percentile ranks are calculated separately for each age bin.

We start by focusing on how the age range of children affects estimates of health persistence. The life-cycle bias stemming from child age of measurement has been a key focus of the income mobility literature (e.g. Haider and Solon, 2006). In panels C and D of Figure 3 we show how estimates of the rank-rank slope vary as we increase the age range of sons or daughters, while using all available years of information irrespective of the age of parents. When we look at rank-rank slopes with respect to mothers' health in panel C of Figure 3, we see a mixed pattern. For sons, the estimates rise from 0.21, when sons are between 30 and 39, to 0.27 when sons are between 60 and 69. However, this increase is not statistically significant. The estimates of the rank-rank slope between mothers and daughters in contrast is very flat with estimates of 0.27 for 3 of the 4 age ranges of daughters. The estimate is slightly smaller at 0.25 when daughters are between 60 and 69. In panel D of Figure 3, when we use fathers' health, the results appear to be more consistent between sons and daughters. In this case, the rank-rank slopes are much higher when children are between the ages of 60 and 69 with point estimates of 0.30 for sons and 0.35 for daughters. However, these estimates are quite noisy.

We explore the effects of child age on estimates of the IHA in panels E and F of Appendix Figure A.6. In these figures we pool sons and daughters together, so the estimates are a little bit less noisy. We find that there is again some suggestive evidence that estimates rise as we increase the age at which children's health is measured. This is particularly true in the case of the IHA between fathers and children, where the estimates are as low as 0.14 when children are between 30 and 39 but rise as high as 0.39 when children are between 60 and 69. Looking across the rank-rank estimates and the IHA, there appears to be suggestive evidence that higher estimates are obtained when children's health is measured at a later age. This pattern is most notable when we use fathers' health as our measure in the parent generation.

We next turn to an analysis of how parent age affects estimates of health persistence. The results for the rank-rank slope are shown in panels C and D of Appendix Figure A.7. We find that estimates appear to be slightly lower when parents' health is measured between the ages of 30 and 39 but roughly constant at later ages. The results for the IHA are shown in panels C and D of Appendix Figure A.6. Interestingly here the estimates appear to decline as parents' health is measured at later ages.

There are two general points worth making here. First, the standard errors are generally too large to find statistically significant differences across these different age groupings. Second, when we restrict the sample based on the ages in one generation, we may mechanically also alter the age composition of the other generation.[28]

In Appendix Table A.4 we show how the rank-rank slope and IHA estimates vary across all combinations of child and parent age. This also allows us to address the issue of compositional bias. These estimates tend to be even noisier so we are hesitant to draw any

[28] We find that when we restrict the sample to children over the age of 50 that there are many more intergenerational matches with parents whose health is measured at an older age as well. On the other hand, if we restrict to samples where parents' health is measured at an older age, there are many more matches to children who are between the ages of 30 to 49.

firm conclusions about how the age structure of the data may affect our estimates. Nevertheless, there is some suggestive evidence that lifecycle biases may be present and that the highest estimates are obtained when both parents' and children's health are measured later in the lifecycle after the age of 50. This stands in contrast to the income mobility literature where IGE estimates tend to have the least bias when parents and children's income are measured closer to mid-career.[29]

Sample Attrition and Death

A common concern with using longitudinal survey data is sample attrition. If attrition is non-random, then estimates based on the available sample may be non-representative of the population of interest. There is mixed evidence of this with respect to the PSID. For example, Schoeni and Wiemers (2015) find that measures of intergenerational income persistence in the PSID are likely to be downward biased. Fitzgerald (2011) finds that attrition does not affect intergenerational persistence estimates and also extends the analysis to measures of health. Our main method of addressing attrition is to use the sampling weights provided by the PSID. We use the last available survey weight for the child as we expect this to have adjusted for all of the factors until the latest time period that could have led to sample attrition. To address the robustness of our estimates to the choice of weights, in Appendix Table A.15 we compare our main estimates to those without using any weights, to using the first available weight, and to using the average weight. It does not appear that our choice of weights leads to vastly different estimates.

Of particular concern is the possibility that a parent's health observation could be missing because of mortality. In our main estimates we only use the recorded health for

[29] See for example, Mazumder (2016). Earlier studies examining the implications of age-related biases on intergenerational income mobility estimates include Jenkins (1987), Grawe (2006), Mazumder (2005) and Haider and Solon (2006). Mazumder and Acosta (2015) discuss age-related biases when studying occupational mobility.

those individuals who are alive.[30] To address this we build an alternative sample in which we truncate parents' age at 70.[31] For families in which (at least) one parent survives past age 70, we simply computed the average of QALY's up until age 70. For families in which both parents died prior to age 70, we imputed zeros for the number of years prior to age 70 that both parents were dead as the QALY's for these years. Note that the QALY for death typically is zero. We then averaged the QALY's through age 70 as before.

The results are shown in Appendix Table A.13. The first two rows show the estimates for this alternative subsample. Our estimate of the IHA is 0.220 and of the rank-rank slope is 0.276 for this subsample. When we impute missing values due to deaths with zeroes, the estimates are lowered to 0.219 and 0.240, respectively. Therefore, we do not think the failure to account for mortality significantly alters our conclusions.

5.3 Interplay between Income and Health

In this section, we examine the joint evolution of health and income across generations. Such an analysis provides a richer understanding of the unique roles of these two aspects of parental socioeconomic status in explaining child outcomes. For example, does parent income play a role distinct from parent health, in explaining child health? Similarly, is there a role for parent health in explaining child income conditional on parent income? To address this, we re-estimate a version of (2) for the pooled sample of sons and daughters where we now include the parent income rank as an explanatory variable in addition to parent health rank.[32] Similarly, we run a version of (2) where our dependent variable is child income rank and where we include both parent income rank and parent health rank as right hand side variables. These results are shown in Table 6 and Figure 4.

---

[30] Appendix Figure A.23 plots the share of children with at least one parent who has died by the end of the sample by age of the parent. 60% of the sample did not have any parents that have died. 34% of the sample have at least one parent that died when the parent was over 80.
[31] Age 70 was chosen because the number of observations for parent's health status fall considerably after this age. See Appendix Figure A.22. The age at last observed health status for our restricted sample is shown in Figure A.24.
[32] The regressions also combine both parents' information for the parent rank measure.

Columns (1) and (5) show the same univariate relationships that we showed in the bottom rows of the panels in Table 4, where the rank-rank slope in health is 0.26 and in income is 0.39. In columns (2) and (4) we show the cross-relationships. The rank-rank slope between parent income and child health is 0.22 and between parent health and child income is 0.27. These cross-relationship associations are quite large and reflect in part the correlations between parent income and health. In columns (3) and (6) we put both parent variables together into the equation simultaneously. The cross-relationships decline and are now both about 0.125. The rank-rank slopes conditional on including the other parent variable both decline by about 0.05 to 0.06 relative to the univariate model. For example, including parent income rank lowers the rank-rank slope in health to 0.207 from 0.261. However, what is important to notice is that R-squared from the models that include both parent variables rise by about 10 to 15 percent.

These results suggest that parent income and parent health are capturing somewhat distinct aspects of parent status that matter for children's outcomes. The inclusion of both parent income and health meaningfully increases the explanatory power of the intergenerational models. Thus, we clearly learn more by including both measures than by simply using one.

5.4 Intergenerational Mobility in a Welfare Measure that Integrates Income and Health

In Table 7 we present our results when we combine income and health together using our monetary metric for health described in the previous section. We consider this integrated measure as a useful proxy for a broader measure of welfare. In column (1) we simply take logs of this measure for both children and parents and produce an elasticity, while in column (2) we calculate percentile ranks in each generation and estimate the rank-rank slope. The elasticity in our "welfare" measure is 0.37 and our rank-rank slope estimate is 0.43.

The estimate for the rank-rank slope in our welfare proxy is higher than the analogous estimate when we only focus on health (0.26) or income (0.39). We speculate that the estimate would be even higher if we had an ideal sample covering the entire lifetime income stream of both parents and children (Mazumder, 2016) so we do not view this estimate as the final word on persistence in overall welfare. Nevertheless, these results suggest that integrating both income and health yields more comprehensive estimates of intergenerational mobility than looking at only one domain.

5.5 Mobility by Subpopulations

We now use our rank mobility measures to describe how health mobility varies across different subgroups of the population. For this analysis, we pooled sons and daughters and combined the health of both parents.[33] Figure 5 plots the predicted percentile of the child's health rank at each percentile of the parent's health rank from rank-rank regressions. In Table 8, we report the associated rank-rank slopes and the expected ranks at 25th and 75th percentile by childhood race, region and parent's education level. For comparisons of subgroups we focus attention on the conditionally expected ranks since this tells us how groups differ with respect to the overall distribution.[34]

We begin by documenting that health mobility also differs substantially by race. We find that blacks experience both lower upward mobility from the bottom and higher downward mobility from the top. Panel A of Figure 5 shows that at every point in the parent health distribution, the expected rank of black children is substantially lower than the expected rank of white children. While whites with parents at the 25th health percentile are expected to reach the 47th percentile, blacks with parents at the same health percentile are expected to reach only the 37th percentile. This mobility gap continues to increase throughout the parent rank distribution with blacks expected to experience higher rates of

[33] Results for each parent-child sample are shown in Appendix Table A.6 (health) and A.7 (income), and the corresponding figures are plotted in Appendix Figures A.8 to A.13. We also report additional measures of upward and downward mobility, such as escaping bottom quintile, by subpopulations in Appendix Table A.8 (health) to A.9 (income).
[34] We find for example, that persistence in health rank is higher for whites than for blacks which suggests greater mobility *within* the black population than within the white population. While this may be interesting, it does not convey how blacks fare in terms of their expected position in the *overall* distribution. This is important since the health distributions differs markedly by race.

downward mobility than whites. The expected rank at the 75th percentile is almost 15 percentiles lower than for whites.

The racial gaps in income mobility are even more pronounced.[35] While whites with parents at the 25th percentile of the income distribution are expected to reach the 45th percentile, blacks are only expected to reach the 28th percentile, nearly 17 percentiles lower. Therefore, black-white *difference* in expected rank at the 25th percentile in income (in absolute value) is therefore 7 percentiles more than the black-white difference in expected rank at the 25th percentile in health. In panel A of Appendix Figure A.17, we plot these black-white "mobility gaps" in health and income throughout the parent distributions of health and income.

We further explore whether these racial gaps also differ by gender. In Figure 6, we visually depict the rank-rank slopes and expected rank at the 25th percentile for different race by gender groups using bar graphs. The top two panels use a pooled sample of sons and daughters for a baseline comparison. Panel A shows that the rank-rank slope is higher for whites than blacks. This means that rank persistence is greater for whites and hence mobility by this metric is lower for whites than blacks. Panel B shows what we previously discussed, namely that the expected rank at the 25th percentile is lower for blacks than whites for both income and health.

In Panels C and D we now break out these gaps separately for sons and daughters. For the rank-rank slopes in household income, we continue to see that rank persistence is much higher for white men than black men but that the racial differences in rank persistence are small for daughters. However, the rank-rank slopes in health continue to be larger for whites than blacks irrespective of gender. In the case of expected ranks at the 25th percentile, the racial gaps remain fairly pronounced irrespective of gender or whether the outcome is health or household income. This suggests that blacks are in all cases disadvantaged when it comes to upward mobility from the bottom. In panels E and F we

[35] See Hertz (2005), Bhattacharya and Mazumder (2011), Mazumder (2014), Davis and Mazumder (2018) and Chetty et al., (2018) for analyses of differences in intergenerational income mobility by race.

repeat the analysis but use *individual income* rather than household income. This exercise highlights the notable finding previously shown in Chetty et al. (2018) that the disadvantage in upward mobility in expected rank at the 25th percentile in individual income is now virtually eliminated for black women. Notably, there is still a large upward mobility disadvantage for black men.

We next turn to differences in health mobility across the regions of the United States in which the child grew up. The most striking finding is that growing up in the South is associated with a lower expected rank throughout the parent distribution. This echoes the findings from Chetty et al. (2014) and Davis and Mazumder (2018) who find similar patterns with income mobility and discuss many of the factors that could explain these regional gaps. Table 8 shows that the expected health rank for a child who grew up in the South with parents at the 25th percentile, is the 42nd percentile, the lowest of the four regions (Table 6, column 2). In comparison, children that grew up in the Northeast and North Central are expected to be at the 46th percentile. Downward mobility is also highest among children growing up in the South. A child from the South with a parent at the 75th percentile in the health distribution has an expected rank of the 55th percentile, which is lower than in all other regions.[36] The disparity between regions in health mobility, however, is not as great as it is for income mobility (Table 8 columns 5 and 6), once again highlighting distinctions between subgroup patterns in health and income mobility.

Lastly, we explore examine differences by parent education level where we again find significant differences. Children whose parents are at the 25th percentile but have a college degree are expected to be at the 52nd percentile, but those with parents without a high school degree are only expected to attain the 37th percentile. This striking disparity is evident throughout the parent health distribution (Panel C of Figure 5). This highlights that the well-known disparity in health by education level also persists to the next generation when looking at offspring health. One explanation is that more educated parents have access to resources that can improve their children's health regardless of their own health

[36] An F-test shows that the regional differences in upward mobility are statistically significant at the 10 percent level but that the differences in downward mobility are not statistically significant.

status (Case et al. 2002). Overall, our analysis suggests that the same groups that face disadvantages with respect to income mobility are also experiencing lower mobility with respect to health.[37]

5.6 Trends in Health Mobility

We next examine trends in health mobility for three groups of cohorts born between: 1950-1959; 1960-1969; and 1970-1979. We start with trends in the IHA which are displayed in Appendix Figure A.18. For this analysis, we use only health observations from age 30 to 40 for children and from age 40 to 70 for parents.[38] Appendix Figure A.18 shows an increase in the intergenerational health association from 0.18 to 0.26 between the birth cohorts born in the 1950s and the 1970s. This increase appears for both the son and daughter subsamples. However, the magnitude of the increase and its statistical significance are somewhat sensitive to the choice of ages used to measure parent health. In Appendix Table A.10, we find that the across cohort change is smaller and not statistically significant when we restrict the samples to measure parent health between the ages of 50 and 70.

We also investigate how rank mobility differs by birth cohort. In Appendix Figure A.19 we plot the rank-rank slopes (Panel A) and expected health ranks at the 25th and 75th percentile (Panel B) for the three cohorts.[39] Unlike the IHA, we find more limited evidence of an increase in rank-rank slopes. While the point estimate increased from 0.23 to 0.27 for the full sample, this change is not statistically significant. When we examine the expected ranks at the 25th and 75th percentile, we do find suggestive evidence that upward mobility from the bottom declined and that downward mobility from the top has increased for more

[37] A comparison of the health mobility gap and income mobility gap by parent education level is shown in panel B of Appendix Figure A.17

[38] The age cutoffs are chosen to capture most of the sample. See Appendix Figure A.1 for plots of the age distributions by generation. Since the age at which child and parent health is measured matters, we also present results using health measurements at different ages (Table A.10).

[39] As with our results for intergenerational health associations, we only use health observations from age 30 to 40 for the child and from 40 to 70 for the parent. The associated results using health measures at different ages for each parent-child sample are presented in Appendix Table A.10.

recent cohorts. In Appendix Table A.11, we examine the changes in rank mobility across the different parent-child types. We find evidence of significant changes in rank persistence and upward mobility from the bottom between fathers and sons.

Overall, we believe this constitutes modestly suggestive evidence of a decline in intergenerational health mobility for more recent cohorts. This finding is potentially consistent with growing evidence of a decline in intergenerational income mobility (e.g. Aaronson and Mazumder, 2008; Davis and Mazumder, 2017) and a decline in intergenerational educational mobility reported by Hilger (2017). Nevertheless, since the most recent cohorts (born since 1970) are still relatively young, future work may be able to better substantiate whether a change in health mobility has taken place.

5.7 The Role of Childhood Circumstances

Finally, we consider how childhood circumstances affect health mobility by using a rich set of covariates on childhood circumstances available in the PSID's Childhood Retrospective Circumstance Study (CRCS). We begin with estimates of the IHA from a pooled sample of sons and daughters in which we combine both parents' health. The results are depicted graphically in Figure 7 using a dot for the point estimate and horizontal lines for the 95 percent confidence interval. The baseline IHA estimate for this sample is 0.241. In Panel A, we then control for different sets or "categories" of control variables. When we include a set of measures of socioeconomic status (e.g. parent years of education, family income, child race and various indices of SES), the IHA falls to 0.169. This finding that SES can account for a significant share (29%) of the intergenerational association in health is consistent with previous studies including Currie and Moretti (2007). If instead of SES controls, we include a set of childhood health measures the IHA estimate falls to just 0.221. Controlling only for measures of childhood stability, school experience, or childhood relationships appears to have little effect on the IHA. Using all the variables together lowers the IHA to 0.154. This accounts for 36% of the unconditional IHA. Finally, panel B, depicts the associated estimates when controlling for one variable at a time, rather than using whole categories.

In Figure 8, we do an analogous breakdown of the rank-rank slope and find very similar patterns. Our baseline estimate of 0.292 falls to 0.232 if we control for family SES background variables and 0.223 if we include all of our controls. Thus, we can account for 24 percent of the rank-rank persistence.

We caution that these decompositions are difficult to interpret in the absence of a structural model as some of these factors might be considered pre-determined and exogenous, but others are clearly endogenous choices that are affected by parent and child health. We simply take these results as useful for a first-pass descriptive analysis. Future researchers may consider structural models to better understand the mechanisms or utilize credible research designs that are able to identify causal channels.

In a separate exercise we also attempt to examine the role of access to health insurance. Access to insurance could be a factor in reducing health persistence and increasing mobility. Consistent with this, Appendix Table A.12 shows that accounting for access to health insurance does appear to lower health persistence and increases the expected ranks of children, but of course insurance choices are endogenous. Therefore, we leave a formal exploration of this mechanism for future research that may be able to exploit more credible research designs with larger samples.

6. Conclusion

Given the rise of inequality and associated concerns about unequal opportunity, studies of intergenerational mobility have received growing attention. Most studies have focused primarily on income, education, or occupation. However, until recently few studies have considered broad-based measures of health despite its central importance to welfare. To fill this void, we provide estimates of intergenerational mobility with respect to a broad-based measure of lifetime health in the US by using repeated measures of quality adjusted life years (QALY) based on self-reported health status. We find that the rank-rank slope in health is about 0.26 suggesting a low degree of intergenerational persistence in health and therefore a relatively high degree of intergenerational health mobility.

We also consider how the joint distribution of income and health evolves over a generation by including both income and health in the parent generation in our rank-based models. Including both dimensions increases the explanatory power of children's outcomes. Hence, health appears to capture a somewhat distinct dimension of socioeconomic status than income.

We further attempt to push the literature forward by integrating income and health into an overall measure of welfare by converting health to a monetary metric. We find the rank-rank slope in this overall measure of welfare to be 0.43 in our sample which is higher than when we consider either income or health separately. We suspect that in samples better designed to capture lifetime income, we would obtain even higher estimates, but we leave that for future research. Future studies may wish to consider how other elements of socioeconomic status might also be integrated into broader measures of welfare.

Finally, we also document important differences in intergenerational health mobility by race, race by gender, region, and parent education levels. For example, we find that blacks experience significantly less upward mobility and significantly higher downward mobility than whites. However, the racial gap in health mobility is smaller than the analogous racial mobility gaps in income. We also find significant difference by parent education level suggesting that the well-known socioeconomic gradient in health persists intergenerationally. Overall, it is clear that the same groups that experience lower intergenerational income mobility also experience lower intergenerational health mobility.

References

Aaronson, Daniel, and Bhashkar Mazumder. 2008. "Intergenerational Economic Mobility in the US: 1940 to 2000." *Journal of Human Resources,* 43(1): 139-172.

Ahlburg, Dennis. 1998. "Intergenerational Transmission of Health". *American Economic Review Papers and Proceedings*, Vol. 88 (2): pp. 265-270

Aizer, Anna, and Janet Currie. 2014. "The Intergenerational Transmission of Inequality: Maternal Disadvantage and Health at Birth." *Science,* 344 (6186): 856–861.

Akbulut-Yuksel, Mevlude, and Adriana D. Kugler. 2016. "Intergenerational persistence of health: Do immigrants get healthier as they remain in the U.S. for more generations?" *Economics & Human Biology*, 23: 136-148.

Anderson Carsten. 2019. "Intergenerational Health Mobility: Evidence from Danish Registers." Economics Working Papers, University of Aarhus, 2019-4.

Beeton, M., & Pearson, K. 1901. "On the inheritance of the duration of life, and on the intensity of natural selection in man". *Biometrika*, 1(1), 50-89.

Bhalotra, Sonia and Samantha Rawlings. 2013. "Gradients of the intergenerational Transmission of Health in Developing Countries" *Review of Economics and Statistics*, 95:2, 660-672

Bhattacharya, Debopam, and Bhashkar Mazumder. 2011. "A nonparametric analysis of black–white differences in intergenerational income mobility in the United States." *Quantitative Economics*, 2(3): 335-379.

Björkegren, Evelina and Lindahl, Mikael and Palme, Marten and Simeonova, Emilia, 2019. "Pre- and Post-Birth Components of Intergenerational Persistence in Health and Longevity: Lessons from a Large Sample of Adoptees." IZA Discussion Paper No. 12451

Black, Sandra, Paul Devereux, and Kjell Salvanes. 2007. "From the Cradle to the Labor Market? The Effect of Birth Weight on Adult Outcomes." *Quarterly Journal of Economics,* 122(1): 409-439.

Bratberg, E., Davis, J., Mazumder, B., Nybom, M., Schnitzlein, D. D., & Vaage, K. 2017. A comparison of intergenerational mobility curves in Germany, Norway, Sweden, and the US. *The Scandinavian Journal of Economics*, *119*(1), 72-101.

Case, Anne, Fertig, Angela and Paxson, Christina, 2005. The lasting impact of childhood health and circumstance. *Journal of Health Economics*, *24*(2): 365-389.

Case, Anne, Darren Lubotsky, and Christina Paxson. 2002. "Economic Status and Health in Childhood: The Origins of the Gradient." *American Economic Review*, 92(5): 1308-1334.

Chetty, Raj, Nathaniel Hendren, Patrick Kline and Emmanuel Saez. 2014. “Where is the land of Opportunity? The Geography of Intergenerational Mobility in the United States.” *The Quarterly Journal of Economics*, 129(4): 1553-1623.

Chetty, Raj, Nathaniel Hendren, Maggie R. Jones, and Sonya R. Porter. 2018 “Race and Economic Opportunity in the United States: An Intergenerational Perspective.” NBER Working Paper No. 24441.

Classen, T. J. (2010). Measures of the intergenerational transmission of body mass index between mothers and their children in the United States, 1981–2004. *Economics & Human Biology*, *8*(1), 30-43.

Classen, T. J., & Thompson, O. (2016). Genes and the intergenerational transmission of BMI and obesity. *Economics & Human Biology*, *23*, 121-133.

Coneus, Katja, and C. Katharina Spiess. 2012. “The intergenerational transmission of health in early childhood—Evidence from the German Socio-Economic Panel Study.” *Economics & Human Biology*, 10(1): 89-97.

Currie, Janet, and Enrico Moretti. 2007. "Biology as Destiny? Short- and Long-Run Determinants of Intergenerational Transmission of Birth Weight." *Journal of Labor Economics*, 25(2): 231-264.

Cutler, David. 2004. Are the Benefits of Medicine Worth What We Pay for It? Available at: https://scholar.harvard.edu/cutler/publications/are-benefits-medicine-worth-what-we-pay-it

Davis, Jonathan, and Bhashkar Mazumder. 2017. “The Decline in Intergenerational Mobility After 1980” Federal Reserve Bank of Chicago Working Paper 2017-05.

Davis, Jonathan, and Bhashkar Mazumder. 2018. “Racial and Ethnic Differences in the Geography of Intergenerational Mobility.” Working Paper.

Darden, Michael and Donna Gilleskie. 2016. “The Effects of Parental Health Shocks on Adult Offspring Smoking Behaviors and Self-Assessed Health.” *Health Economics*, 25(8): 939-954.

Deaton, A. and Paxson, C., 1994. Intertemporal choice and inequality. *Journal of political economy*, 102(3): 437-467.

Deaton, A.S. and Paxson, C., 1998. Health, income, and inequality over the life cycle. In *Frontiers in the Economics of Aging* (pp. 431-462). University of Chicago Press.

DeSalvo Karen, Vincent Fan, Mary McDonell, and Stephan Fihn. 2006. “Predicting Mortality and Healthcare Utilization with a Single Question” *Health Services Research*, 40(4):1234–46.

Erickson, Pennifer, Ronald Wilson, and Ildy Shannon. 1995. “Years of Healthy Life.” *Healthy People 2000: Statistical Notes from Centers for Disease Control and Prevention*, 7:1-14.

Fitzgerald, John M. 2011. “Attrition in Models of Intergenerational Links Using the PSID with Extensions to Health and to Sibling Models,” The B.E. Journal of Economic Analysis & Policy: Vol. 11: Iss. 3 (Advances), Article 2.

Fletcher, Jason and Katie M. Jajtner. 2019. “Intergenerational Health Mobility: Magnitudes and Importance of Schools and Place.” *NBER Working Paper* 26442.

Finkelstein, Amy, Nathaniel Hendren, and Erzo F. P. Luttmer, “The Value of Medicaid: Interpreting Results from the Oregon Health Insurance Experiment,” *Journal of Political Economy* 127(6): 2836-2874.

French, Eric, and John Bailey Jones. 2017. “Health, Health Insurance, and Retirement: A Survey.” *FRB Richmond Working Paper* no. 17-3.

Giuntella, Osea, Giulia La Mattina and Climent Quintana-Domeque. 2019. “Intergenerational Transmission of Health at Birth from Mothers and Fathers” IZA Discussion Paper No. 12105.

Graeber, D. 2020. *Intergenerational health mobility in germany*. Working Paper.

Grawe, Nathan. 2006. “The Extent of Lifecycle Bias in Estimates of Intergenerational Earnings Persistence.” *Labour Economics,* 13(5): 551-570.

Haider Steven, and Gary Solon. 2006. “Life-Cycle Variation in the Association Between Current and Lifetime Earnings.” *American Economic Review,* 96(4):1308–20.

Halliday, Timothy J., 2011. “Health inequality over the life-cycle.” *The BE Journal of Economic Analysis & Policy*, 11(3).

Halliday, Timothy J. 2014. “Unemployment and Mortality: Evidence from the PSID.” *Social Science & Medicine*, 113, 15-22.

Halliday, Timothy J., Bhashkar Mazumder, and Ashley Wong. 2020. “The Intergenerational Transmission of Health in the United States: A Latent Variables Analysis.” *Health Economics*, 29(3): 367-381.

Hertz, Tom. 2005. "Rags, Riches and Race: The Intergenerational Economic Mobility of Black and White Families in the United States." In *Unequal Chances: Family Background and Economic Success*, edited by Samuel Bowles, Herbert Gintis, and Melissa Osborne, pp. 165–91. New York: Russell Sage and Princeton University Press.

Hilger, Nathaniel. 2017. "The Great Escape: Intergenerational Mobility in the United States, 1930-2010." Working Paper.

Hong, Sok and Jiwol Park. 2016. "The Socioeconomic Gradient in the Inheritance of Longevity: A Study of American Genealogies." Working Paper.

Idler, Ellen, and Yael Benyamini. 1997. "Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies." *Journal of Health and Social Behavior,* 38(1): 21-37.

Jenkins, Stephen. 1987. "Snapshots Versus Movies: 'Lifecycle Biases' and the Estimation of Intergenerational Earnings Inheritance." *European Economic Review,* 31(5):1149–58.

Johnson, Rucker, and Robert Schoeni. 2011. "The Influence of Early-Life Events on Human Capital, Health Status, and Labor Market Outcomes Over the Life Course." *The B.E. Journal of Economic Analysis & Policy.* 11(3): 2521.

Johnston, David W., Stefanie Schurer, and Michael A. Shields. 2013. "Exploring the Intergenerational Persistence of Mental Health: Evidence from Three Generations." *Journal of Health Economics* 32(6): 1077-1089.

Jones, Charles and Klenow, Peter, 2016. Beyond GDP? Welfare across countries and time. *The American Economic Review*, 106(9): 2426-2457.

Kaplanis, J., Gordon, A., Shor, T., Weissbrod, O., Geiger, D., Wahl, M., ... & Bhatia, G. (2018). Quantitative analysis of population-scale family trees with millions of relatives. Science, 360(6385), 171-175.

Kim, Younoh, Bondan Sikoki, John Strauss, and Firman Witoelar. 2015. "Intergenerational correlations of health among older adults: Empirical evidence from Indonesia." *The Journal of the Economics of Ageing,* 6: 44-56.

Kolenikov, Stanislav, and Gustavo Angeles. 2009. "Socioeconomic Status Measurement with Discrete Proxy Variables: Is Principal Component Analysis a Reliable Answer?" *The Review of Income and Wealth*, 55(1): 128-165.

Lach, Saul and Ritov, Yaacov and Simhon, Avi. 2008. "The Transmission of Longevity Across Generations." Working Paper.

Loureiro, M. L., Sanz-de-Galdeano, A., & Vuri, D. (2010). Smoking habits: like father, like son, like mother, like daughter?. Oxford Bulletin of Economics and Statistics, 72(6), 717-743.

Mazumder, Bhashkar. 2005. "Fortunate Sons: New Estimates of Intergenerational Mobility in the United States Using Social Security Earnings Data." *Review of Economics and Statistics*, 87(2):235–55

Mazumder, Bhashkar. 2014. "Black-White Differences in Intergenerational Mobility in the United States." *Economic Perspectives*, 38(1).

Mazumder, Bhashkar, and Miguel Acosta. 2014. "Using Occupation to Measure Intergenerational Mobility." *The ANNALS of the American Academy of Political and Social Science*, 657: 174-193.

Mazumder, Bhashkar. 2016. "Estimating the Intergenerational Elasticity and Rank Association in the U.S.: Overcoming the Current Limitations of Tax Data." in Lorenzo Cappellari , Solomon W. Polachek , Konstantinos Tatsiramos (ed.) *Inequality: Causes and Consequences (Research in Labor Economics, Volume 43)* Emerald Group Publishing Limited, pp.83 – 129

Mazumder, Bhashkar. 2018. "Intergenerational Mobility in the US: What We Have Learned from the PSID." *The ANNALS of the American Academy of Political and Social Science,* 680(1): 213-234.

Miilunpalo, Seppo, Ilkka Vuori, Pekka Oja, Matti Pasanen, and Helka Urponen, 1997. "Self-rated health status as a health measure: The predictive value of self-reported health status on the use of physician services and on mortality in the working-age population." *Journal of Clinical Epidemiology*, 50(5): 517-528.

Nyborn, Martin, and Jan Stuhler. 2014. "Heterogeneous Income Profiles and Lifecycle Bias in Intergenerational Mobility Estimation." *Journal of Human Resources,* 51(1): 239-268.

Palumbo, M.G., 1999. Uncertain medical expenses and precautionary saving near the end of the life cycle. *The Review of Economic Studies*, 66(2): 395-421.

Pascual, Marta, and David Cantarero. 2009. "Intergenerational health mobility: an empirical approach based on the ECHP." *Applied Economics,* 41: 451-458.

Reardon, Sean. 2011. "The widening academic achievement gap between the rich and the poor: New evidence and possible explanations." In R. Murnane & G. Duncan

(Eds.), *Whither Opportunity? Rising Inequality and the Uncertain Life Chances of Low-Income Children*. New York: Russell Sage Foundation Press.

Rust, J. and Phelan, C., 1997. How social security and medicare affect retirement behavior in a world of incomplete markets. *Econometrica:* 781-831.

Schmidt, C. M., & Tauchmann, H. (2011). Heterogeneity in the intergenerational transmission of alcohol consumption: A quantile regression approach. *Journal of Health Economics*, 30(1), 33-42.

Schoeni, Robert F. and Wiemers, Emily E. 2015. "The implications of selective attrition for estimates of intergenerational elasticity of family income". *J Econ Inequal*. 2015 September ; 13(3): 351–372.

Solon, Gary. 1992. "Intergenerational Income Mobility in the United States." *American Economic Review,* 82(3): 393-408.

Steves, Claire Joanne, Timothy D. Spector, and Stephen H. D. Jackson. 2012. "Ageing, genes, environment and epigenetics: what twin studies tell us now, and in the future." *Age and Ageing*, 41(5): 581-586.

Thompson, Owen. 2016. "Gene-Environment Interaction in the Intergenerational Transmission of Asthma." *Health Economics,* 26(11): 1337-1352.

Yashin A. and Iachine I. 1997. "How Frailty Models can be used for Evaluating Longevity Limits: Taking Advantage of an Interdisciplinary Approach" *Demography* 34(1): 31-48

Figure 1: Health status over life cycle

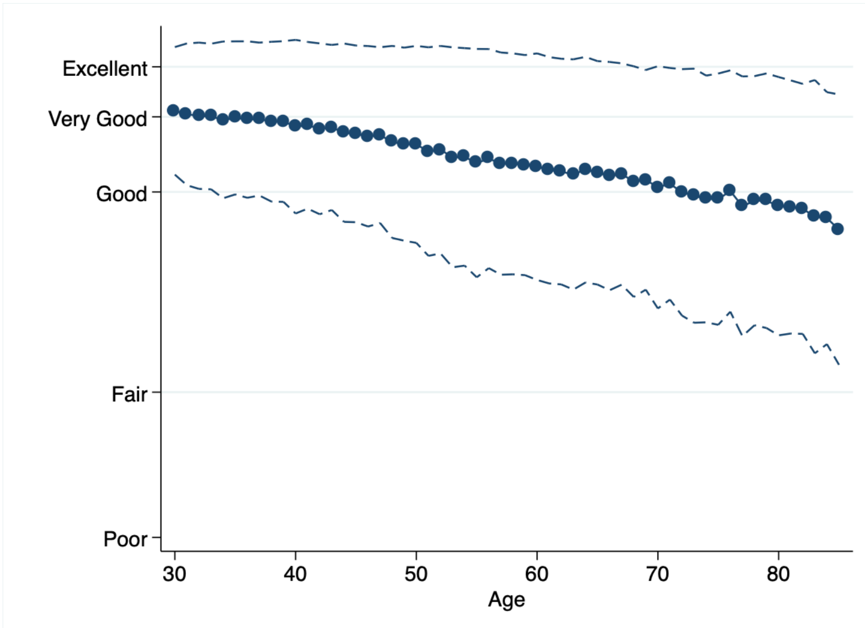
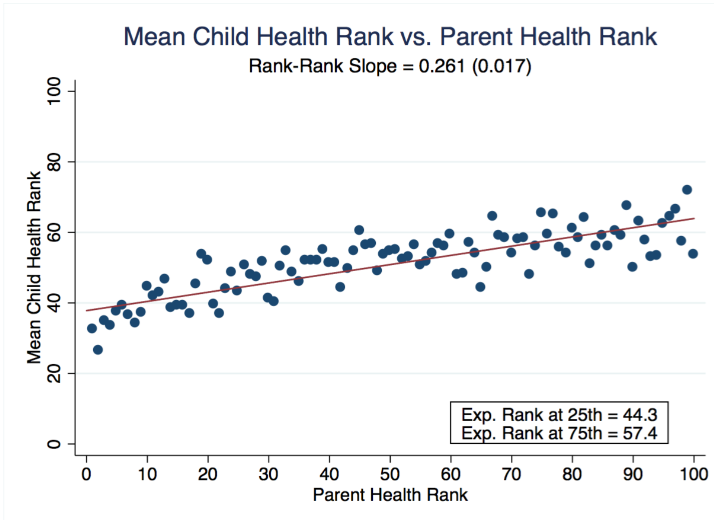
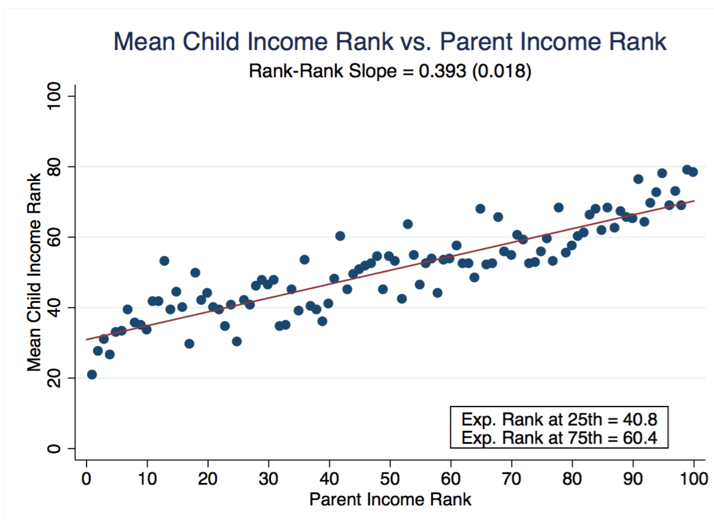


Figure 1 plots the mean continuous health measure at each age up to 85 for the full sample. The dashed line represents +/- 1 SD. It includes all generations and genders. The mean at each age is weighted using the most recently available individual weights. The scale reflects the lower cutoffs between reported health status categories on the 0-100 HALex scale where 100 equals perfect health and zero is equivalent to death: [95,100] is excellent, [85,95) is very good, [70,85) is good, [30,70) is fair and [1,30) for poor health. The continuous health measure for each individual at a given survey year is the midpoint of the interval corresponding to their reported health category.

Figure 2: Health and income rank mobility using both parents' health for all children



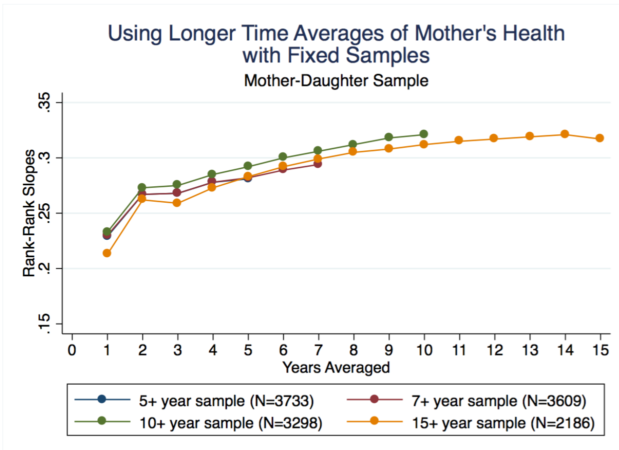
(a) Health rank mobility



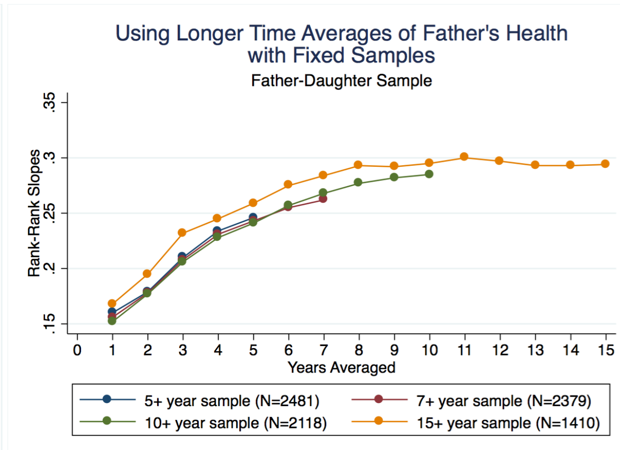
(b) Income rank mobility

Figure 2 Panel A plots the mean child health percentile rank at each percentile of the parent health distribution using both parents' health for all children. Panel B plots the mean child income percentile rank at each percentile of the parent income distribution using both parents' income for all children. The red line in each graph is the estimated regression line from the weighted bivariate regression of child rank on parent rank. The rank-rank slope is the coefficient on parent income percentile. The expected rank at the 25th (or 75th) percentile is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent health or income rank distribution. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately for each generation. Income percentile ranks are constructed from the time-averaged total family income adjusted for age, family size and inflation and are ranked separately for each generation. All means and regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

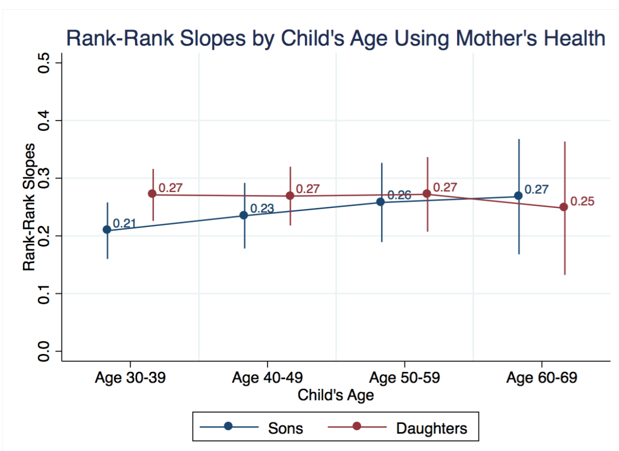
Figure 3: Robustness of rank-rank slopes



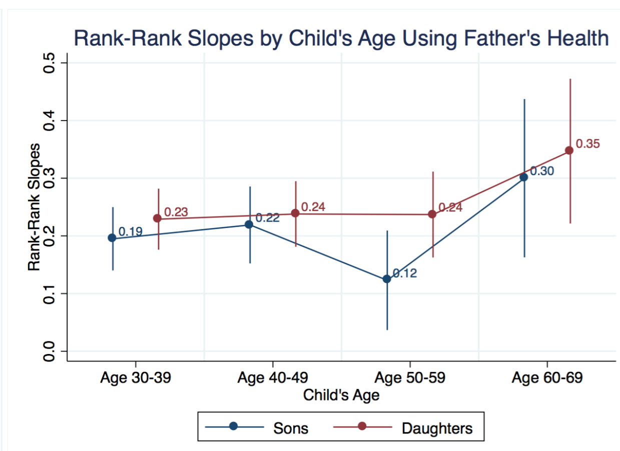
(a) Attenuation bias: varying years of parent health measurement for mothers and daughters



(b) Attenuation bias: varying years of parent health measurement for fathers and daughters



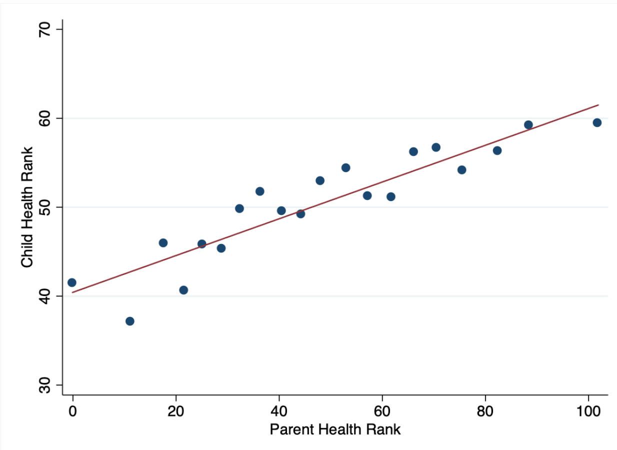
(c) Life cycle bias: varying age of child's health measurement using mother's health



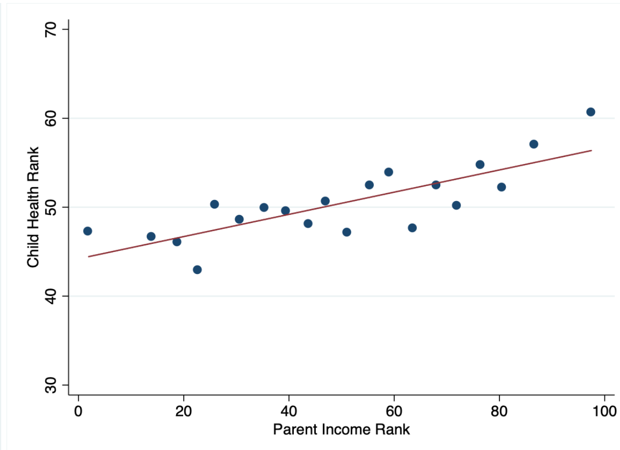
(d) Life cycle bias: varying age of child's health measurement using father's health

Figure 3 evaluates the robustness of the estimates of rank-rank slopes to attenuation and life cycle biases. Panels A and B plot the rank-rank slopes using varying time averages of mother (Panel A) and fathers (Panel B) health within fixed samples of daughters with parents with at least 5, 7, 10, or 15 years of health observations. The number of observations for each fixed sample is reported in parentheses. Panels C and D plot the rank-rank slopes using child's health observations within the 10-year age bins and all available parent health observations over age of 30. In all specifications in Figure 3, the rank-rank slopes are estimated from weighted bivariate regressions of child health rank on parent health rank using the most recently available individual sampling weights of the child. Age adjustment and percentile ranks are done separately for each alternative parent and child health measure.

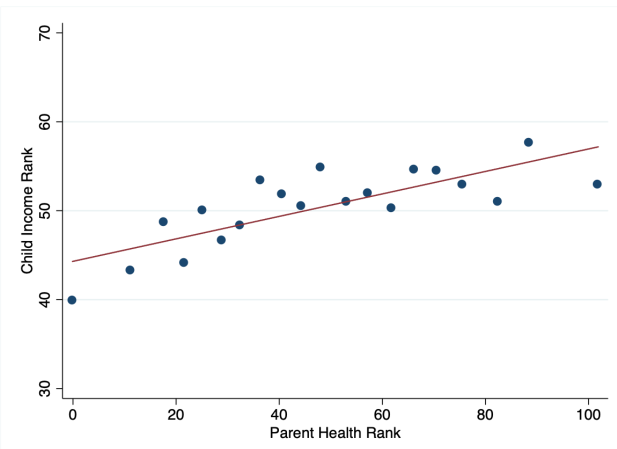
Figure 4: Interplay of health and income rank mobility using both parents' health for all children



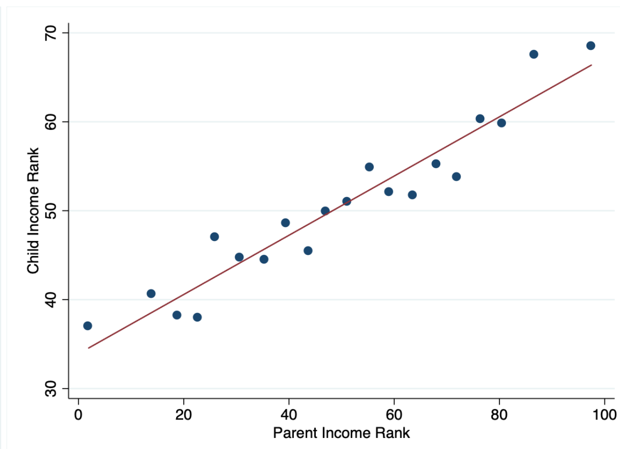
(a) Child's Health vs. Parent's Health
(Controlling for Income)



(b) Child's Health vs. Parent's Income
(Controlling for Health)



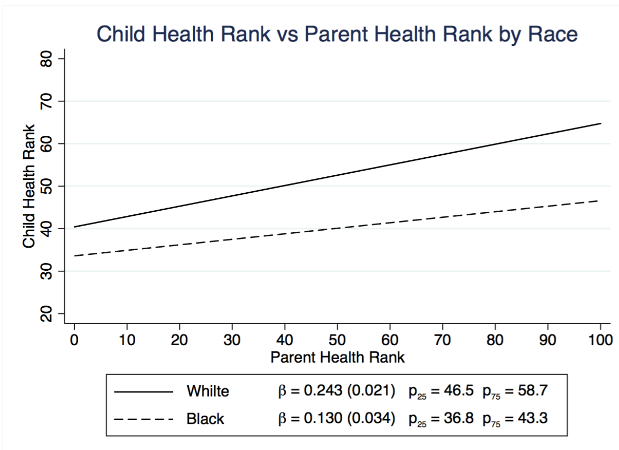
(c) Child's Income vs. Parent's Health
(Controlling for Income)



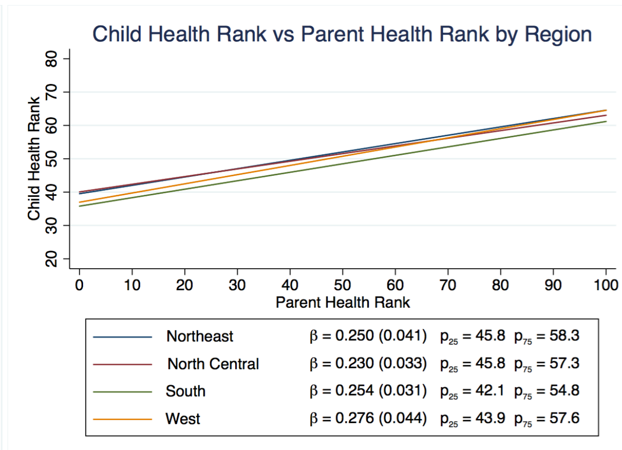
(d) Child's Income vs. Parent's Income
(Controlling for Health)

Figure 4a plots the expected child health rank on parents' health rank after residualizing for parents' income rank. Figure 4b plots the expected child health rank on parents' income rank after residualizing for parents' health rank. Figure 4c plots the expected child income rank on parents' health rank after residualizing for parents' income rank. Figure 4d plots the expected child income rank on parents' income rank after residualizing for parents' health rank.

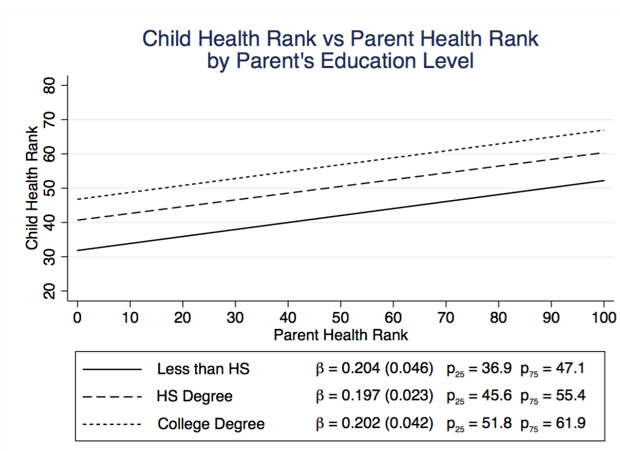
Figure 5: Health rank mobility by race, region and education



(a) Rank mobility by race



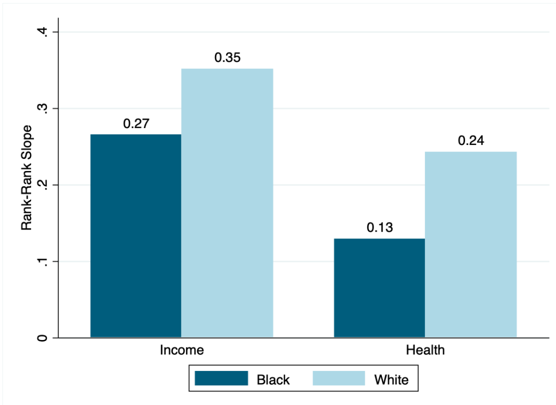
(b) Rank mobility by region



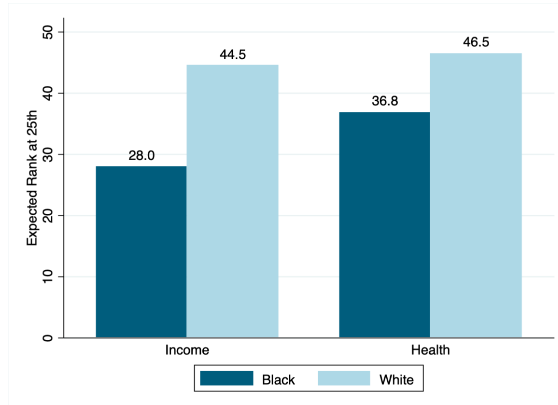
(c) Rank mobility by parent's education

Figure 5 plots estimated regression lines from the weighted bivariate regressions of child rank on parent rank by race, childhood region, and education using both parents' health for all children. Race refers to the reported race of the child. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. Education refers to the highest level attained by at least one of the parents in the most recently available survey. The rank-rank slope, denoted by β, is the coefficient on parent health percentile. The expected rank at the 25th (or 75th) percentile, denoted by $p_{25}(p_{75})$, is the predicted rank from the rank-rank specification for a child with parents at the 25th (or 75th) percentile of the parent health rank distribution. Health percentile ranks are constructed from the age-adjusted baseline health measure and are ranked separately by generation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

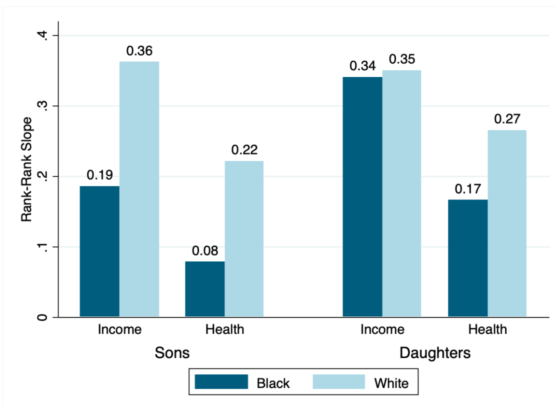
Figure 6: Health and income rank mobility by race and gender (using both parents' health)



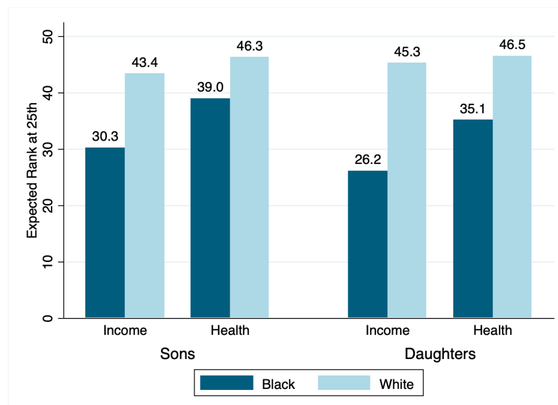
(a) Rank-rank slope (All children)



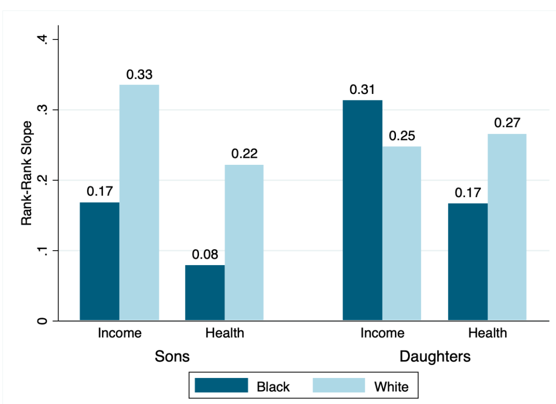
(b) Expected rank at 25th percentile (All children)



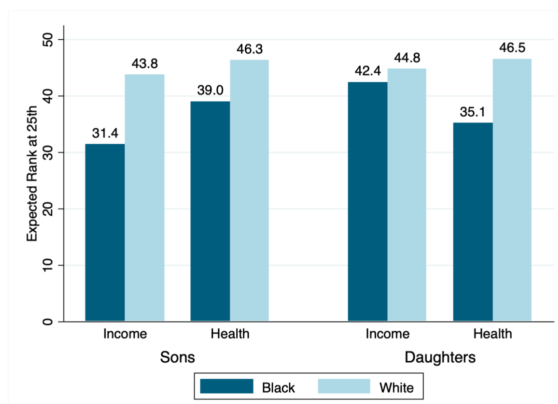
(c) Rank-rank slope by gender (Household income)



(d) Expected rank at 25th percentile by gender (Household income)



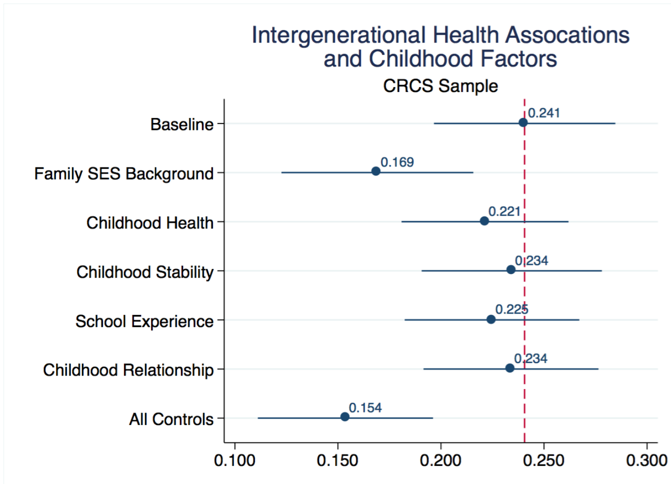
(e) Rank-rank slope by gender (Individual income)



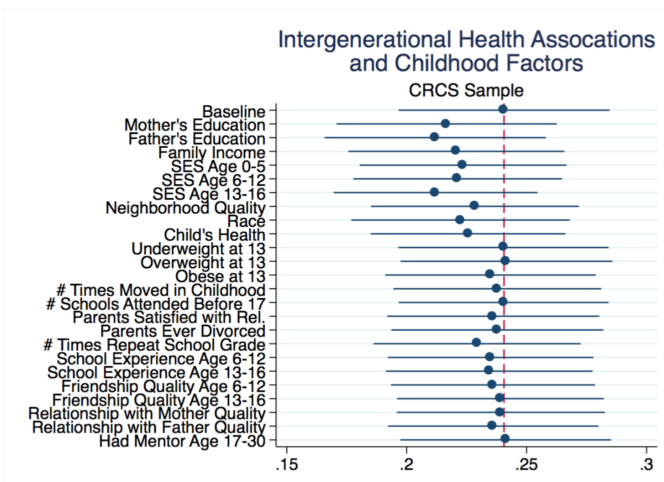
(f) Expected rank at 25th percentile by gender (Individual income)

Figure 6 plots the rank-rank slope coefficients and expected rank at the 25th percentile from the weighted bivariate regressions of child rank on parent rank by race and gender. All panels use both parent's health or income measure. Race refers to the reported race of the child. The outcome variable for income rank-rank specifications is household income or individual labor income, as specified. The rank-rank slope is the coefficient on parent health percentile. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately for each generation. Family income percentile ranks are constructed from the time-averaged total family income adjusted for age, family size and inflation and are ranked separately for each generation. Individual income percentile ranks are constructed from time-averaged total individual labor income adjusted for age and inflation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients are robust to heteroskedasticity and within-family correlation.

Figure 7: Effect of childhood factors on intergenerational health associations



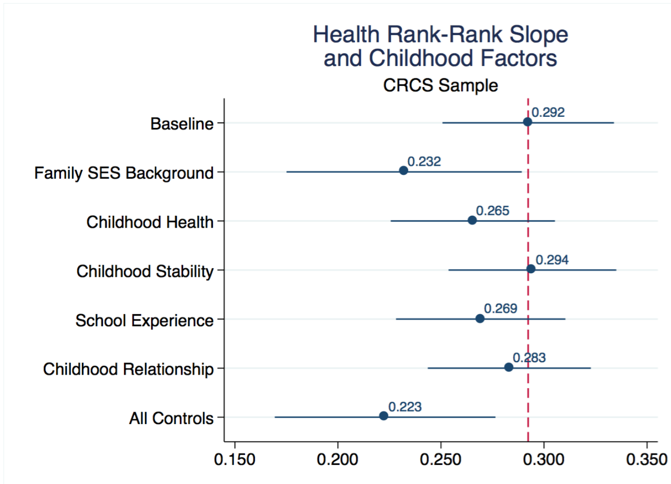
(a) Decomposition of IHA by categories of childhood factors



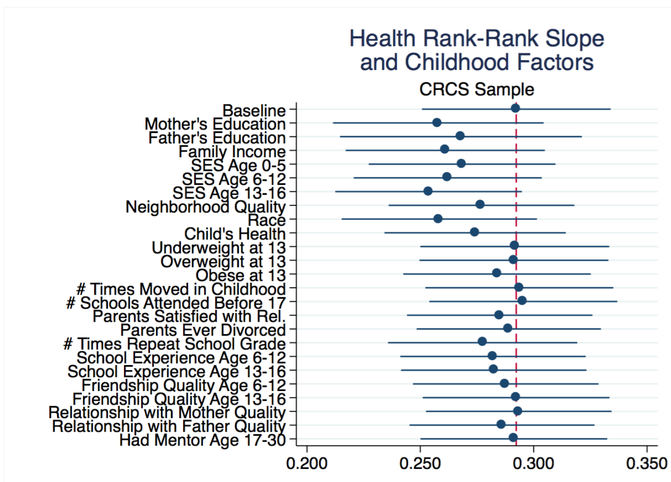
(b) Decomposition of IHA by individual childhood factors

Figure 7 shows how the baseline intergenerational health association is attributable to various childhood factors for the sample of individuals in the child generation who were also part of the 2014 Childhood Retrospective Circumstance Study (CRCS). Panel A plots the intergenerational health associations as groups of childhood factors are added to the baseline regression of child's health measure on parent's health measure. Family SES Background includes mother's years of education, father's years of education, family income, SES Index Age 0-5, SES Index Age 6-12, SES Age 13-16, Neighborhood Quality Index, and controls for race of child (white, black or other). Childhood Health includes Child Health Index, Underweight at 13, Overweight at 13, and Obese at 13. Childhood Stability includes number of times moved in childhood, number of schools attended before 17, if parents were satisfied with their relationship, and if parents ever divorced. School Experience includes number of times repeat school grade, School Experience Index Age 6-12, School Experience Age 13-16. Childhood Relationship includes Friendship Quality Index Age 6-12, Friendship Quality Index Age 13-16, Relationship with Mother Quality Index, Relationship with Father Quality Index, and having a mentor at age 17-30. Panel B plots the intergenerational health associations as individual childhood factors are added to the baseline regression. The dependent variable for all specifications is the child's time-averaged continuous health measure. The parent health measure is the average of the mother's and father's health if available. Otherwise, only one parent's health measure is used. All specifications include as controls the quadratic age terms of the mother, father and child, and missing indicators for mother and father. Age for both generations is defined as the time-averaged age of the individual at the time of health observations. The red dashed lines denote the baseline intergenerational health association. Additional details on the CRCS variables can be found in Appendix A. All regressions are weighted using individual CRCS sampling weights of the child. 95% confidence intervals are shown calculated using standard errors that are robust to heteroskedasticity and within-family correlation.

Figure 8: Effect of childhood factors on rank-rank slopes



(a) Decomposition of rank-rank slopes by categories of childhood factors



(b) Decomposition of rank-rank slopes by individual childhood factors

Figure 8 shows how the baseline rank-rank slope is attributable to various childhood factors for the sample of individuals in the child generation who were also part of the 2014 Childhood Retrospective Circumstance Study (CRCS). Panel A plots the rank-rank slopes as groups of childhood factors are added to the baseline bivariate regression of child's health rank on parent's health rank. Family SES Background includes mother's years of education, father's years of education, family income, SES Index Age 0-5, SES Index Age 6-12, SES Age 13-16, Neighborhood Quality Index, and controls for race of child (white, black or other). Childhood Health includes Child Health Index, Underweight at 13, Overweight at 13, and Obese at 13. Childhood Stability includes number of times moved in childhood, number of schools attended before 17, if parents were satisfied with their relationship, and if parents ever divorced. School Experience includes number of times repeat school grade, School Experience Index Age 6-12, School Experience Age 13-16. Childhood Relationship includes Friendship Quality Index Age 6-12, Friendship Quality Index Age 13-16, Relationship with Mother Quality Index, Relationship with Father Quality Index, and having a mentor at age 17-30. Panel B plots the rank-rank slopes as individual childhood factors are added to the baseline regression. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately by gender within each generation. The red dashed lines denote the baseline rank-rank slope. Additional details on the CRCS variables can be found in Appendix A. All regressions are weighted using individual CRCS sampling weights of the child. 95% confidence intervals are shown calculated using standard errors that are robust to heteroskedasticity and within-family correlation.

Table 1: Summary Statistics

A. Parents		
	Father (1)	Mother (2)
Age	56.72	56.17
	(10.48)	(11.04)
Years of Education	12.96	12.51
	(3.10)	(2.68)
Total Family Income (2013 Dollars)	59405.94	50318.97
	(50472.40)	(45929.52)
Overall Health Status	77.37	75.73
	(17.08)	(16.60)
Excellent	7%	4%
Very Good	35%	30%
Good	34%	39%
Fair	22%	25%
Poor	2%	2%
Years of Health Measurement (Min=1, Max=22)	14.81	15.48
Number of Observations	5,440	7,721
Number of Observations (CRCS)	2,425	3,151

B. Children			
	All (3)	Sons (4)	Daughters (5)
Age	38.54	38.68	38.41
	(6.02)	(6.09)	(5.94)
Years of Education	13.96	13.85	14.06
	(2.25)	(2.30)	(2.20)
Total Family Income (2013 Dollars)	54303.96	56973.13	51636.98
	(46086.89)	(45849.59)	(46174.67)
Overall Health Status	82.60	83.38	81.83
	(13.50)	(13.51)	(13.44)
Excellent	11%	13%	9%
Very Good	44%	45%	43%
Good	32%	30%	34%
Fair	12%	11%	14%
Poor	1%	1%	1%

Table 1: Summary Statistics – Continued

Race			
White	83%	85%	81%
Black	14%	13%	16%
Other	3%	3%	3%
Childhood Region			
Northeast	22.4%	22.1%	22.7%
North Central	28.1%	28.7%	27.6%
South	31.8%	31.7%	32.0%
West	17.4%	17.2%	17.6%
Alaska and Hawaii	0.1%	0.1%	0.0%
Foreign Country	0.2%	0.3%	0.1%
Years of Health Measurement (Min=1, Max=22)	8.7	8.5	8.8
Number of Observations	8,115	3,828	4,287
Number of Observations (CRCS)	3,281	1,407	1,874

C. CRCS Variables

	All (6)	Sons (7)	Daughters (8)
Family Socioeconomic Background			
SES Index Age 0-5	0.00	0.01	-0.01
	(1.00)	(1.01)	(1.00)
SES Index Age 6-12	0.00	0.01	-0.01
	(1.00)	(1.00)	(1.00)
SES Index Age 13-16	0.00	0.05	-0.04
	(1.00)	(0.95)	(1.04)
Neighborhood Quality Index	0.00	-0.02	0.02
	(1.00)	(1.02)	(0.98)
Childhood Health			
Child Health Index	0.00	0.08	-0.07
	(1.00)	(0.93)	(1.05)
Underweight at 13	0.06	0.06	0.06
	(0.24)	(0.23)	(0.24)
Overweight at 13	0.17	0.22	0.12
	(0.38)	(0.42)	(0.33)
Obese at 13	0.12	0.14	0.09
	(0.32)	(0.35)	(0.29)
Childhood Stability			
# Times Moved in Childhood	1.04	1.06	1.02

Table 1: Summary Statistics – Continued

	(1.81)	(1.82)	(1.80)
# Schools Attended Before 17	3.35	3.26	3.42
	(1.71)	(1.70)	(1.71)
Parents Satisfied with Relationship	0.72	0.75	0.70
	(0.45)	(0.43)	(0.46)
Parents Ever Divorced	0.13	0.13	0.14
	(0.34)	(0.33)	(0.34)
School Experience			
# Times Repeat School Grade	0.13	0.17	0.10
	(0.45)	(0.44)	(0.45)
School Experience Index Age 6-12	0.00	-0.15	0.13
	(1.00)	(1.00)	(0.98)
School Experience Index Age 13-16	0.00	-0.13	0.11
	(1.00)	(1.02)	(0.97)
Childhood Relationship			
Friendship Quality Index Age 6-12	0.00	0.01	-0.01
	(1.00)	(0.95)	(1.04)
Friendship Quality Index Age 13-16	0.00	0.03	-0.03
	(1.00)	(0.97)	(1.03)
Relationship with Mother Quality Index	0.00	0.11	-0.10
	(1.00)	(0.90)	(1.07)
Relationship with Father Quality Index	0.00	0.02	-0.02
	(1.00)	(0.97)	(1.03)
Had Mentor Age 17-30	0.65	0.63	0.67
	(0.48)	(0.48)	(0.47)

Table 1 provides descriptive statistics of the data. Panel A and B reports the summary statistics for the main sample from the 1984-2013 survey years of the Panel Study of Income Dynamics (PSID). This sample includes only individuals who are matched to at least one parent. Across both generations, only individuals with at least one health status observation measured at age 30 and older are included. Panel C reports the summary statistics for the individuals in the child generation who were also part of the 2013 Childhood Retrospective Circumstance Study (CRCS). Age refers to the mean time-averaged age of the individual at the time of all available health observations. Years of education is the mean total years of education attained reported at most recently available survey. Total family income reported in 2013 dollars is the mean time-averaged total family income, which includes all taxable income and cash transfers for all family members after adjusting for family size and inflation. Overall health status is the time-averaged of all available health observations after converting the ordinal health status into continuous units on a 0-100 scale. The categories of health status (excellent, very good, good, fair, poor) are the percentage of individuals whose time-averaged overall health status is in that category according to the HALex scale. Years of health measurement refers to the mean number of total years of health observations for each individual. The race categories refer to the percentage of the sample that identifies with that race in most recently available survey. Childhood region categories refer to percentage of the sample that grew up in that region, defined as the modal region in which the household is surveyed before the child is 18. For CRCS variables (Panel C), all index variables are reported in original units and are constructed using PCA across the full CRCS sample. Details on the index construction and all other CRCS variables can be found in Appendix A. Standard deviations are reported in parentheses. All reported means and standard deviations are weighted using the most recently available individual sampling weight. For the CRCS variables, means and standard deviations are weighted using the individual CRCS sampling weight.

Table 2: Probability of child in at least good health conditioned on mother or father's health status

	Mother's Health			Father's Health		
	All (1)	Sons (2)	Daughters (3)	All (4)	Sons (5)	Daughters (6)
Mother's Health Excellent	0.159	0.179	0.136			
	(0.0249)	(0.0269)	(0.0414)			
Mother's Health Very Good	0.152	0.144	0.160			
	(0.0163)	(0.0223)	(0.0222)			
Mother's Health Good	0.109	0.0955	0.121			
	(0.0166)	(0.0232)	(0.0220)			
Father's Health Excellent				0.145	0.166	0.122
				(0.0222)	(0.0299)	(0.0326)
Father's Health Very Good				0.122	0.123	0.120
				(0.0184)	(0.0279)	(0.0229)
Father's Health Good				0.106	0.107	0.103
				(0.0181)	(0.0268)	(0.0236)
Constant	0.571	0.517	0.632	0.344	0.599	0.103
	(0.205)	(0.289)	(0.287)	(0.263)	(0.306)	(0.361)
Observations	7,606	3,600	4,006	5,376	2,596	2,780
R-squared	0.048	0.052	0.046	0.039	0.037	0.043
Y-mean	0.871	0.884	0.859	0.895	0.900	0.890

Each column of Table 2 reports the coefficients and standard errors from a weighted regression using sampling weights of the most recently available individual weights for the child. The dependent variable for all specifications is an indicator variable that takes on the value of 1 (and 0 otherwise) if the child's time-averaged continuous health measure is in good, very good or excellent health according to the HALex scale. The omitted category for all regressions is parent (mother or father) health in poor or fair health. All specifications include as controls the quadratic age terms of the parent (mother or father) and quadratic age terms of the child. Age for both generations are defined as the time-averaged age of the individual at the time of all available health observations. Columns 1 and 4 report the results using all children. Columns 2 and 5 report the results using sons only. Columns 3 and 6 report the results using daughters only. Y-mean refers to the weighted mean of the dependent variable within the regression sample. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.

Table 3: Intergenerational health associations by parent-child samples

	All Children (1)	Sons (2)	Daughters (3)
Mother's Health Only	0.204	0.200	0.206
	(0.019)	(0.023)	(0.025)
Father's Health Only	0.172	0.165	0.181
	(0.017)	(0.023)	(0.025)
Both Parents' Health	0.229	0.218	0.238
	(0.020)	(0.024)	(0.025)
Y-Mean	73.2	73.46	72.94
Observations	7987	3763	4224

Each cell of Table 3 reports the coefficient and standard error on the parent health measure from a separate regression. The regressions are weighted using sampling weights of the most recently available individual weights for the child. The dependent variable for all specifications is the child's time-averaged continuous health measure. The main explanatory variable for specifications using mother's health or father's health is the parent's time-averaged continuous health measure. For regressions using both parents' health, the parent health measure is the average of the mother's and father's health if available. Otherwise, only one parent's health measure is used. All specifications include as controls the quadratic age terms of the parent (mother or father) and quadratic age terms of the child. Age for both generations is defined as the time-averaged age of the individual at the time of all available health observations. In specifications using both parents' health, quadratic age terms of the mother and father are included separately. If the individual is missing health observations from one of the parents, the quadratic age terms for that parent is replaced with a 0. Two indicator variables, one for mother and one for father, are included that take on the value of 1 (and 0 otherwise) if that parent is missing. Column 1 reports the results using all children. Column 2 reports the results using sons only. Column 3 reports the results using daughters only. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation. Y-mean refers to the weighted mean of the dependent variable within the regression sample using both parents health for that column. Observations is the number of observations in the regression sample using both parents health for that column.

Table 4: Health and income rank mobility by parent-child samples

A. Health Rank Mobility				
	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile	Observations
	(1)	(2)	(3)	(4)
Mother-Son	0.243	44.72	56.847	3564
	(0.025)	(0.933)	(0.979)	
Mother-Daughter	0.287	44.137	58.472	3960
	(0.022)	(0.827)	(0.900)	
Father-Son	0.212	47.116	57.706	2520
	(0.028)	(1.113)	(1.071)	
Father-Daughter	0.251	47.426	60.001	2689
	(0.025)	(0.992)	(0.995)	
Both Parents-All Children	0.261	44.342	57.402	7937
	(0.017)	(0.644)	(0.688)	
B. Income Rank Mobility				
	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile	Observations
	(5)	(6)	(7)	(8)
Mother-Son	0.447	39.508	61.872	3564
	(0.024)	(0.900)	(0.951)	
Mother-Daughter	0.473	39.935	63.58	3960
	(0.021)	(0.771)	(0.882)	
Father-Son	0.406	43.495	63.785	2520
	(0.029)	(1.102)	(1.098)	
Father-Daughter	0.417	44.284	65.129	2689
	(0.024)	(0.943)	(0.987)	
Both Parents-All Children	0.393	40.766	60.439	7937
	(0.018)	(0.684)	(0.690)	

Each row of Table 4 reports the rank-rank slope, expected ranks at the 25th and 75th health (Panel A) or income (Panel B) percentile and number of observations for each parent-child sample. The rank-rank slope is the coefficient on parent health or income percentile from the bivariate regression of child rank on parent rank. The expected rank at the 25th (or 75th) percentile is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent health or income rank distribution. All regressions are weighted using the most recently available sampling weight of the child. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.

Table 5: Health mobility measures using alternative health index (1999-2013 sample)

A. Intergenerational Health Associations

	Post-1999 Self-Reported Health Status			Alternative Health Index		
	All Children (1)	Sons (2)	Daughters (3)	All Children (4)	Sons (5)	Daughters (6)
Mother's Health Only	0.171	0.162	0.179	0.171	0.156	0.184
	(0.017)	(0.025)	(0.022)	(0.015)	(0.021)	(0.022)
Father's Health Only	0.114	0.091	0.14	0.094	0.092	0.094
	(0.017)	(0.021)	(0.025)	(0.017)	(0.020)	(0.026)
Both Parents' Health	0.179	0.157	0.199	0.165	0.157	0.171
	(0.017)	(0.025)	(0.022)	(0.016)	(0.021)	(0.024)
Y-Mean	69.85	69.84	69.86	0.85	0.85	0.84
Observations	5162	2415	2747	5162	2415	2747

B. Rank Mobility

	Post-1999 Self-Reported Health Status			Alternative Health Index		
	Rank-Rank Slope (7)	Expected Rank at 25th Percentile (8)	Expected Rank at 75th Percentile (9)	Rank-Rank Slope (10)	Expected Rank at 25th Percentile (11)	Expected Rank at 75th Percentile (12)
Mother-Son	0.188	45.946	55.351	0.243	44.373	56.528
	(0.027)	(1.054)	(1.042)	(0.026)	(1.051)	(0.964)
Mother-Daughter	0.258	44.29	57.212	0.244	44.701	56.915
	(0.025)	(0.961)	(0.952)	(0.025)	(0.986)	(0.958)
Father-Son	0.142	49.656	56.732	0.169	47.995	56.432
	(0.030)	(1.168)	(1.187)	(0.030)	(1.204)	(1.086)
Father-Daughter	0.219	47.591	58.523	0.145	47.999	55.267
	(0.029)	(1.165)	(1.094)	(0.030)	(1.157)	(1.170)
Both Parents-All Children	0.212	45.505	56.092	0.227	45.065	56.398
	(0.019)	(0.718)	(0.741)	(0.018)	(0.716)	(0.695)

Table 5 reports the intergenerational health associations and rank-rank slopes using only individuals with health observations at age 30 and older from 1999-2013. The Post-1999 Self-Reported Health Status is time-averaged continuous health measure analogous to baseline health measure using only data from survey years 1999-2013. The Alternative Health Index is the time-averaged fraction of 21 adverse health conditions that the individual does not have. Details on the Alternative Health Index is provided in Appendix B. Each cell of Panel A reports the coefficient and standard error on the parent health measure from a weighted regression of child health on parent health. Specifications in Columns 1 to 3 use the Post-1999 Self-Reported Health Status as the health measure for both parent and child generations. Columns 4 to 6 use the Alternative Health Index as the health measure for both parent and child generations. Y-mean refers to the weighted mean of the dependent variable within the regression sample using both parents' health for that column. Observations is the number of observations in the regression sample using both parents' health for that column. See notes to Table 3 for additional details on the intergenerational health association specifications. Each row of Panel B reports the rank-rank slope, expected ranks at the parent 25th and 75th health percentile and number of observations each parent-child sample. Columns 7 to 9 use the Post-1999 Self-Reported Health Status to construct percentile ranks for both parent and child generation separately for each gender. Columns 10 to 12 use the Alternative Health Index to construct percentile ranks for each parent and child generation separately for each gender. See notes to Table 4 for additional details on rank-rank specifications. All regressions are weighted using the most recently available sampling weight of the child. Standard errors for all regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.

Table 6: Interplay of Health and Income Mobility

	Child Health Rank			Child Income Rank		
	(1)	(2)	(3)	(4)	(5)	(6)
Parent Health Rank	0.261		0.207	0.272		0.126
	(0.017)		(0.019)	(0.018)		(0.019)
Parent Income Rank		0.224	0.125		0.393	0.333
		(0.019)	(0.020)		(0.018)	(0.020)
Constant	37.812	39.313	34.260	37.314	30.929	27.839
	(0.973)	(1.107)	(1.116)	(1.030)	(1.037)	(1.128)
Observations	7937	7937	7937	7937	7937	7937
R^2	0.075	0.050	0.087	0.080	0.154	0.168

Table 6 reports estimates from regressing child health rank (columns 1-3) or child income rank (columns 4-6) on parent health rank and parent income rank. The parent health rank is constructed from the age-adjusted both parents health measure. The child health rank is constructed from the pooled age-adjusted child health measure for sons and daughters. All regressions are weighted using the most recently available sampling weight of the child. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.

Table 7: Intergenerational Mobility in “Welfare”, Integrating Income and Health

	(1) Log(Welfare)	(2) Welfare Rank
Log(Parents’ Welfare)	0.368	
	(0.020)	
Parents’ Welfare Rank		0.429
		(0.017)
Constant	7.484	29.572
	(0.239)	(0.968)
Observations	7987	7937
R^2	0.183	0.189

All regressions are weighted using the most recently available sampling weight of the child. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.

Table 8: Health and income rank mobility by race, region, and education

	Health Mobility			Income Mobility			
	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile	Observations
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Race							
White	0.243	46.501	58.665	0.352	44.499	62.096	4555
	(0.021)	(0.806)	(0.733)	(0.020)	(0.815)	(0.716)	
Black	0.130	36.849	43.337	0.265	27.957	41.226	3139
	(0.034)	(1.039)	(1.780)	(0.058)	(1.358)	(2.502)	
Test of Equality P-Value	0.004	0.000	0.000	0.157	0.000	0.000	
Region							
Northeast	0.250	45.781	58.306	0.367	46.588	64.926	1073
	(0.041)	(1.573)	(1.534)	(0.044)	(1.758)	(1.521)	
North Central	0.230	45.805	57.297	0.381	41.675	60.743	1896
	(0.033)	(1.225)	(1.225)	(0.033)	(1.167)	(1.339)	
South	0.254	42.137	54.835	0.408	37.255	57.651	3181
	(0.031)	(1.087)	(1.357)	(0.030)	(1.134)	(1.232)	
West	0.276	43.864	57.646	0.344	41.323	58.51	1020
	(0.044)	(1.854)	(1.554)	(0.044)	(1.752)	(1.591)	
Test of Equality P-Value	0.864	0.095	0.321	0.649	0.000	0.002	
Education							
Less than HS	0.204	36.925	47.114	0.261	30.269	43.313	2245
	(0.046)	(1.209)	(2.548)	(0.048)	(1.037)	(2.657)	
HS Degree	0.197	45.596	55.447	0.26	43.708	56.721	4206
	(0.023)	(0.807)	(0.939)	(0.026)	(0.892)	(0.989)	
College Degree	0.202	51.801	61.891	0.3	51.623	66.648	1471
	(0.042)	(2.005)	(1.063)	(0.039)	(2.012)	(0.961)	
Test of Equality P-Value	0.989	0.000	0.000	0.678	0.000	0.000	

Each row of Table 8 reports the rank-rank slope, expected ranks at the 25th and 75th health (Columns 1-3) or income (Columns 4-6) percentile and number of observations (Column 7) by subgroups for all children. The parent health (income) rank is constructed from the age-adjusted both parents health (income) measure. The child health (income) rank is constructed from the pooled age-adjusted child health (income) measure for sons and daughters. Race refers to the reported race of the child. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. Education refers to the highest level of education attained by at least one of the parents in the most recently available survey. All regressions are weighted using the most recently available sampling weight of the child. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation. P-values from F-tests on the equality of the rank-rank slopes, expected ranks at the 25th and 75th percentiles within each category (region, race, or education) are reported.

For Online Publication

Appendix A. Details on the CRCS variables

The 2014 Childhood Retrospective Circumstances Study (CRCS) is a supplement to the PSID and collected information from 8,072 household heads and spouses from the 2013 survey. Over 100 questions about their childhood experiences were asked. A subset of this data was restricted and was not included in our study. We utilize information from the main survey as well as the CRCS to capture important childhood factors that characterize family socioeconomic background, childhood health, childhood stability, school experience, and childhood relationship quality. Due to the large number of survey questions about each of these topics, we used principal components analysis (PCA) to create a single index for socioeconomic status (age 0-5, age 6-12, age 13-16), neighborhood quality, school experience (age 6-12, age 13-16), friendship quality (age 6-12, age 13-16), relationship with mother quality and relationship with father quality. Because of the discrete nature of the survey responses, we used the polychoric version of PCA as recommended by Kolenikov and Angeles (2009). For the construction of the final indices, we utilize only factors that had factor loadings greater than 0.35. Each individual was then assigned the predicted principal component score using the first component. We describe below the variables we utilize in our analysis.

Family Socioeconomic Status

We use three variables from the main PSID data, mother's years of education, father's years of education, and family income. Years of education is the total number of education completed reported in the most recently available survey. Family income is the baseline time-averaged total family income of the parents. From the CRCS supplement, we also constructed indices for socioeconomic status for ages 0-5, ages 6-12 and ages 13-16. The survey questions included in the final construction of the SES Age 0-5 index (with factor loadings >0.35) are how much father worked, how many times father was unemployed, if there was financial struggle, and if the family was on welfare for at least three months during ages 0-5. For SES Age 6-12 and SES Age 13-16 indices, the included survey questions are how much father worked, how many times father was unemployed, how many times mother as unemployed, if there was financial struggle, and if the family was on welfare for at least three months during the specified ages. Lastly, we created a neighborhood quality index about the neighborhood the child lived the longest between age 6-12. The final index included the following survey questions: if it was safe to be alone outside at night, if it was safe during the daytime for children, if it was safe during the nighttime for children, if neighbors were willing to help each other out, if neighborhood was close knit, if the neighborhood was clean and attractive, and if people in the neighborhood took care of their homes and property.

Childhood Health

From the CRCS, we constructed a childhood health index, which is constructed from the following: childhood health status on a scale of 1-5, if the child missed at least one month of school for health reasons, if the child had difficulty hearing, if the child had asthma, diabetes, respiratory disease, heart trouble, severe headaches or migraines, stomach problems and high blood pressure. The CRCS also included height and weight at age 13, from which we calculated the associated BMI to create indicators for underweight, overweight and obese at 13.

Childhood Stability

We used the following variables from the CRCS: number of times the child moved between age 0 and 16, number of schools attended between age 17, if the parents were satisfied with their relationship with each other, and if the parents ever divorced.

School Experience

From the CRCS, we use the number of times the child repeated school grade and created two indices pertaining to school experience during ages 6-12 and 13-16. The final indices were constructed using the following variables: if the child was bullied at or outside of school, if the child was happy at school, if the child was worried about physical safety at school, and if the child was a bully at or outside of school during the specified ages.

Childhood Relationships

We created two indices for friendship quality at ages 6-12 and 13-16. The indices were constructed using the following variables: if the child was lonely for friends, if the child was comfortable with friends and if the child had no best friend. To capture relationship quality with parents, we created a relationship quality with mother index and a relationship quality with father index. The final index for mother is constructed using communication status with mother, how much mother could understand problems, how much the child could confide in mother, how much tension with mother growing up, the relationship status with mother, how close the child was with mother, how much affection mother gave and how much effort mother put into parenting. The final index for father is constructed using communication status with father, how much father understood problems growing up, how much the child could confide in father, the relationship status with father and how close the child was with the father. Lastly, we included an indicator that takes on the value of 1 if the child had a nonrelative mentor during age 17-30.

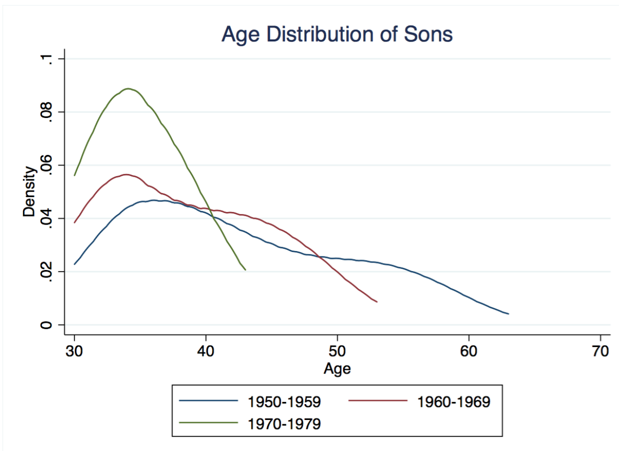
Appendix B. Construction of Alternative Health Index

Beginning in 1999, the PSID added a great number of survey questions regarding health status and health conditions. We utilize information on 20 adverse conditions as well as weight and height to construct an indicator for obesity. The alternative health index is the fraction of the 21 adverse conditions the individual does not have, so that higher index means better health. The 21 adverse conditions are:

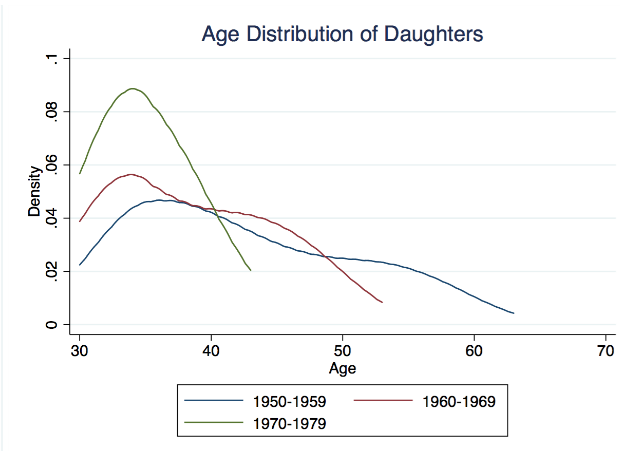
1. Emotional, nervous, or psychiatric problem
2. Learning disorder
3. Mental ability or memory loss
4. Arthritis
5. Asthma
6. High blood pressure
7. Cancer
8. Diabetes
9. Heart attack
10. Heart disease
11. Lung disease
12. Stroke
13. Difficulty bathing
14. Difficulty dressing
15. Difficulty eating
16. Difficulty getting out of bed
17. Difficulty getting outdoors
18. Difficulty using toilet
19. Difficulty walking
20. Disability that limits type of work or amount of work the individual does
21. Obesity (BMI >30) calculated using height and weight

Appendix Figures

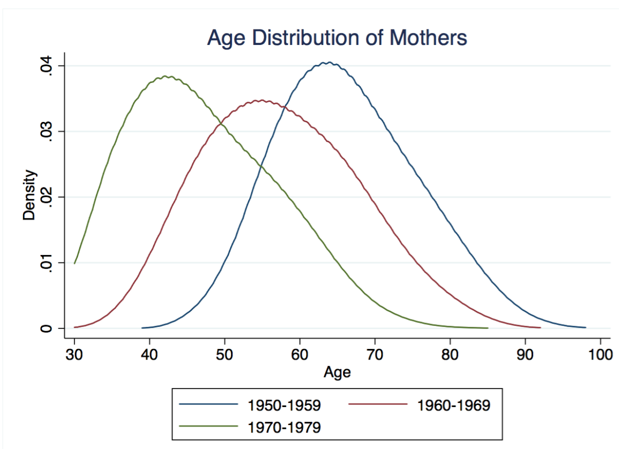
Figure A.1: Age distribution by child's birth cohort and generation



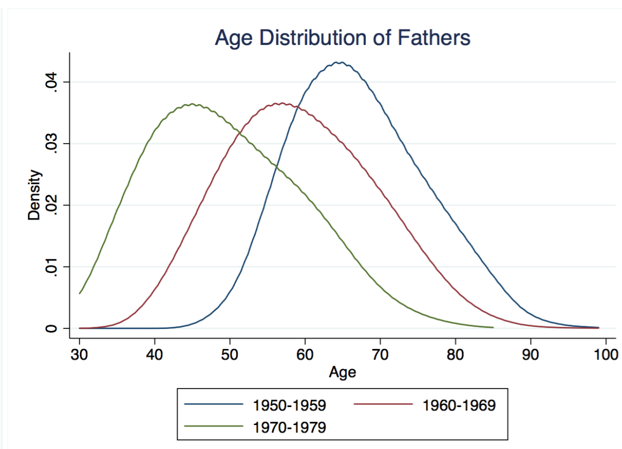
(a) Sons



(b) Daughters



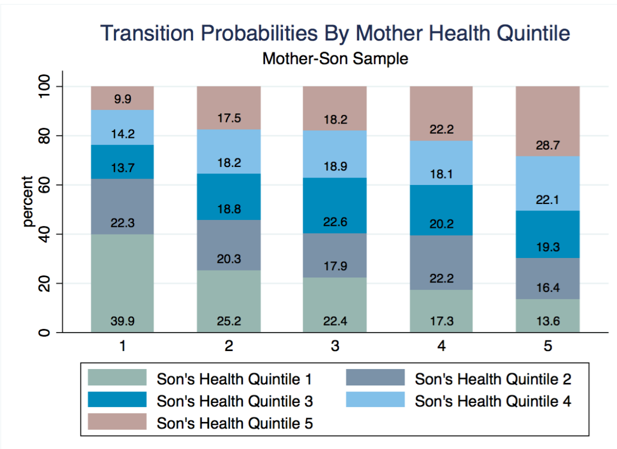
(c) Mothers



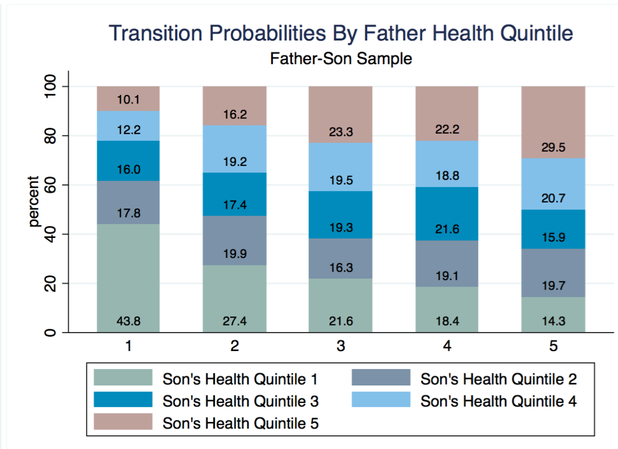
(d) Fathers

Figure A.1 shows the age distribution of each generation by gender and birth cohort of the child. Each plot shows the kernel density estimator by child's birth cohort using the Epanechnikov kernel and 5-year bandwidths for the baseline sample. All estimates are weighted using the most recently available individual sampling weights.

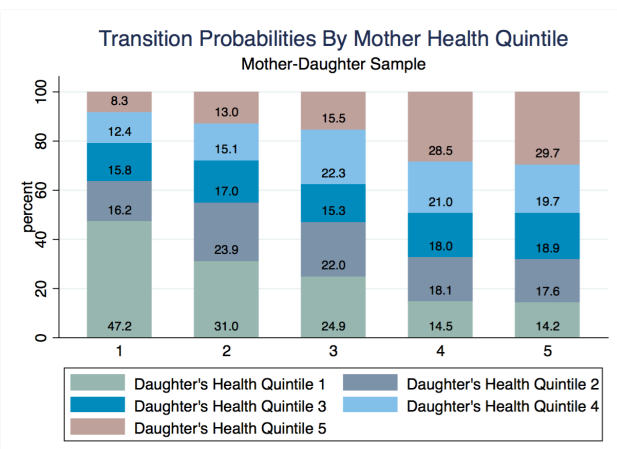
Figure A.2: Health transition probabilities by parent-child samples



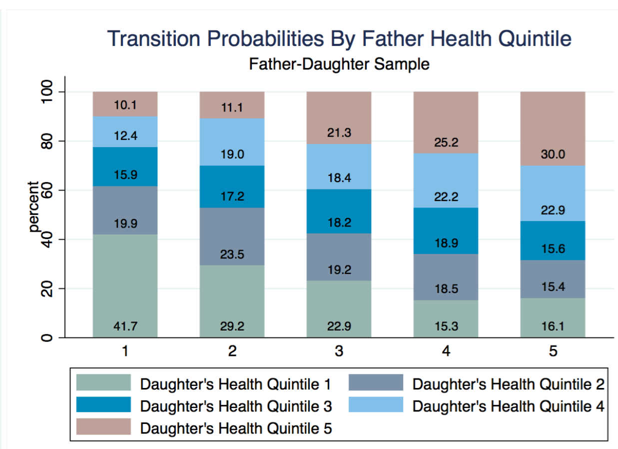
(a) Transition matrix for mothers and sons



(b) Transition matrix for fathers and sons



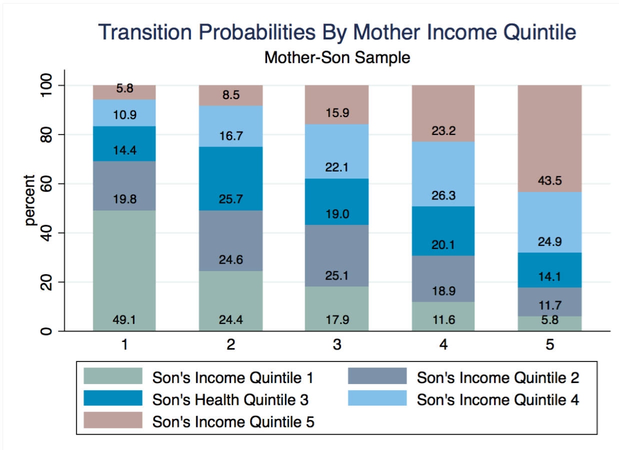
(c) Transition matrix for mothers and daughters



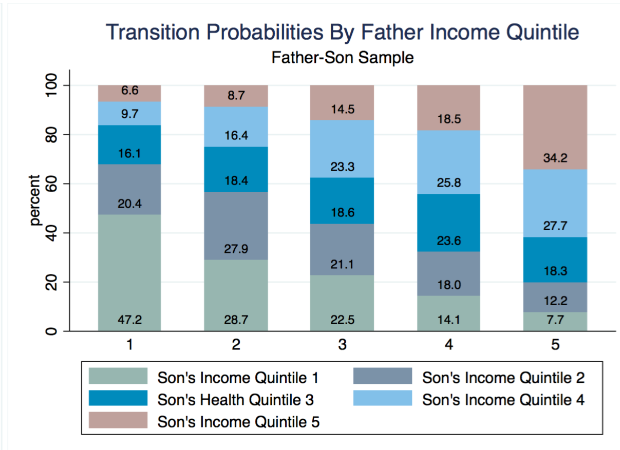
(d) Transition matrix for fathers and daughters

Figure A.2 shows the transition probabilities into different health quintiles by parent health quintile for each parent-child sample. Health quintiles are constructed from the age-adjusted baseline health measure and are created separately by gender within each generation using the full baseline sample. All estimates are weighted using the most recently available individual sampling weights of the child.

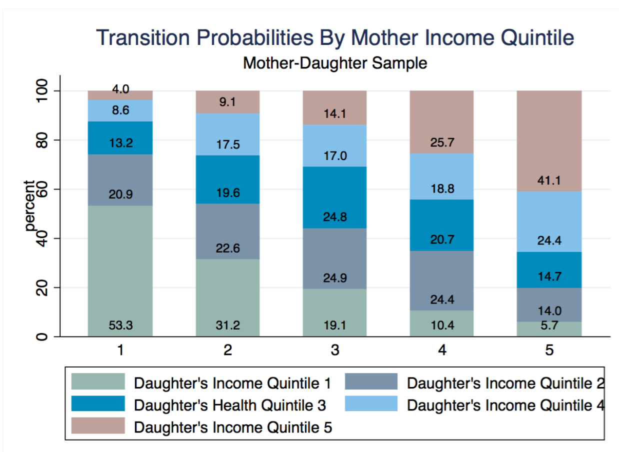
Figure A.3: Income transition probabilities by parent-child samples



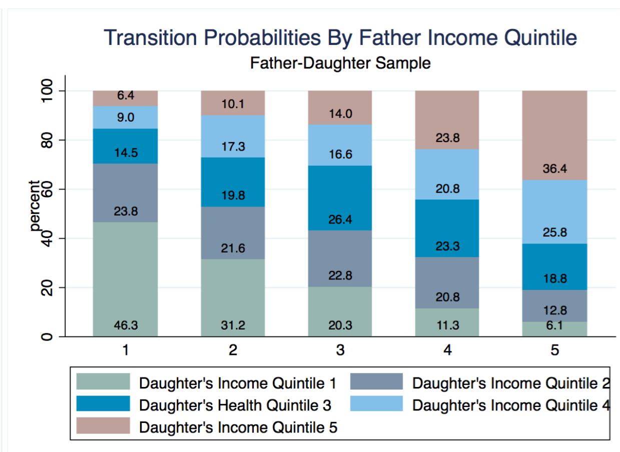
(a) Transition matrix for mothers and sons



(b) Transition matrix for fathers and sons



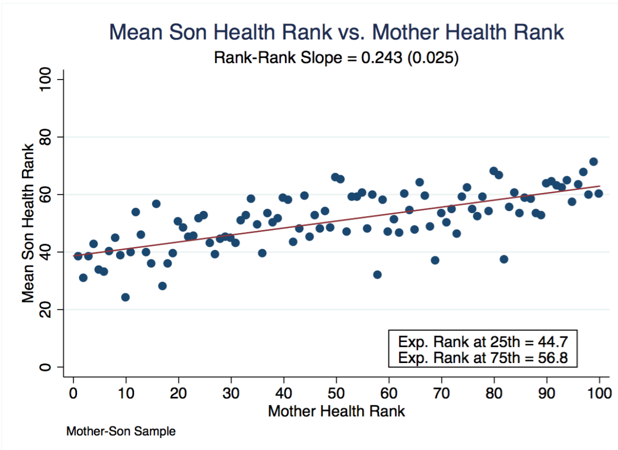
(c) Transition matrix for mothers and daughters



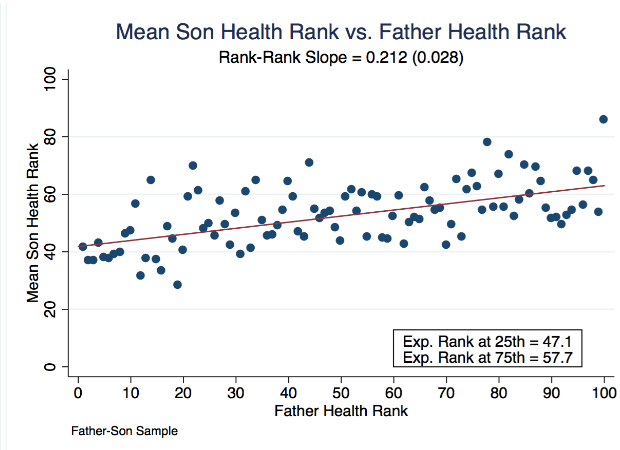
(d) Transition matrix for fathers and daughters

Figure A.3 shows the transition probabilities into different income quintiles by parent income quintile for each parent-child sample. Income quintiles are constructed from the time-averaged total family income and are created separately by gender within each generation using the full baseline sample. All estimates are weighted using the most recently available individual sampling weights of the child.

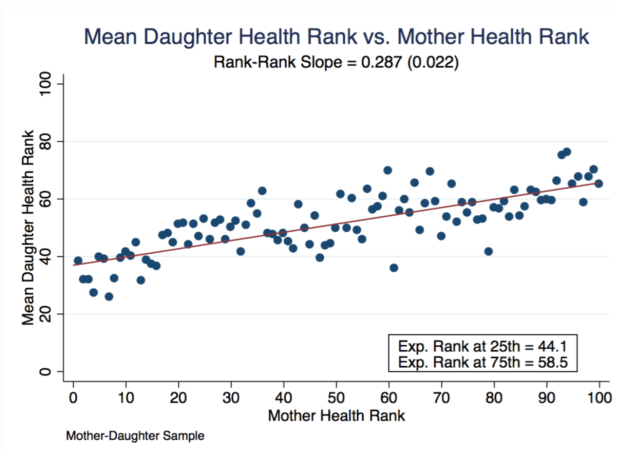
Figure A.4: Health rank mobility by parent-child samples



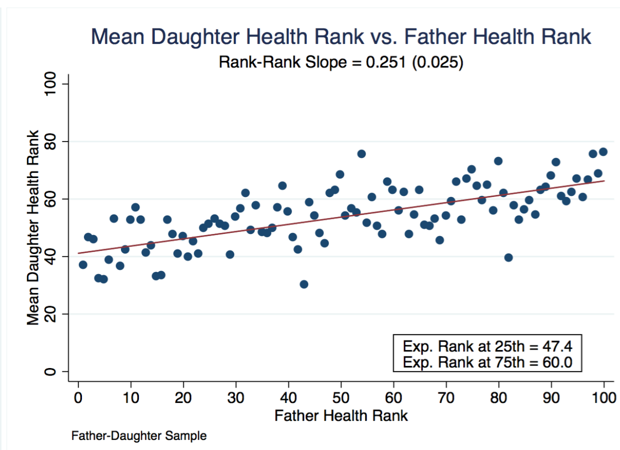
(a) Rank mobility for mothers and sons



(b) Rank mobility for fathers and sons



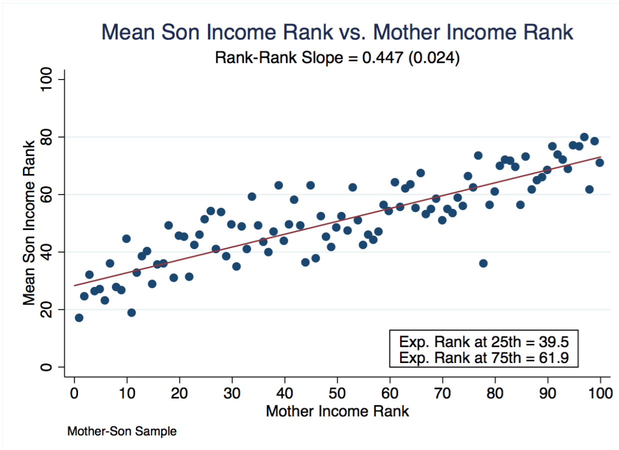
(c) Rank mobility for mothers and daughters



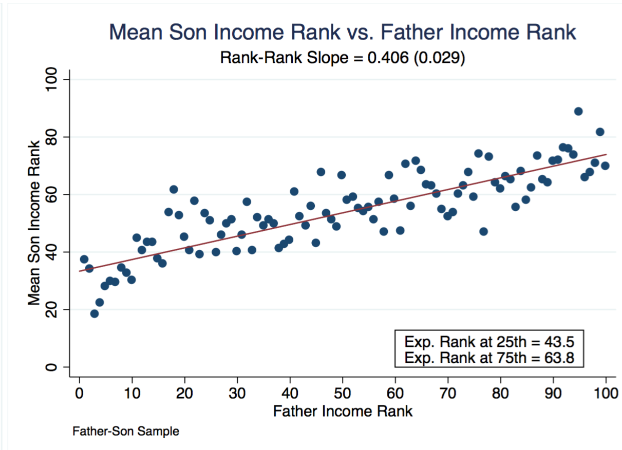
(d) Rank mobility for fathers and daughters

Figure A.4 plots the mean child percentile health rank at each percentile of the parent health distribution for each parent-child sample. The red line in each graph is the estimated regression line from the weighted bivariate regression of child rank on parent rank for that sample. The rank-rank slope is the coefficient on parent health percentile. The expected rank at the 25th (or 75th) percentile is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent health or income rank distribution. Health percentile ranks are constructed from the age-adjusted baseline health measure and are ranked separately by gender within each generation. All means and regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

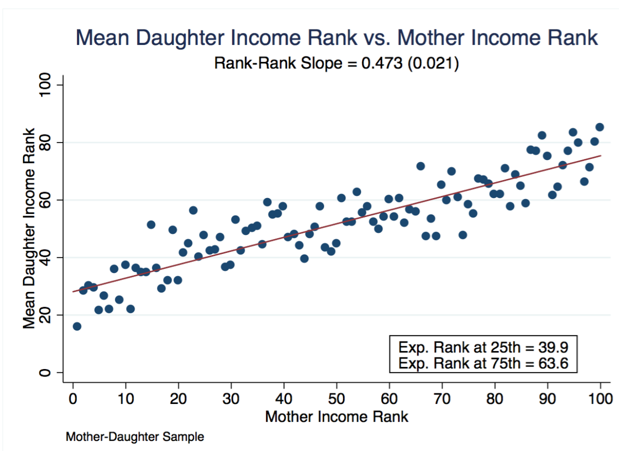
Figure A.5: Income rank mobility by parent-child samples



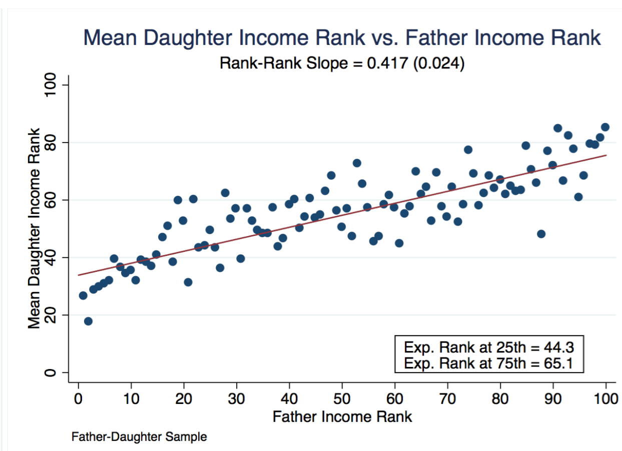
(a) Rank mobility for mothers and sons



(b) Rank mobility for fathers and sons



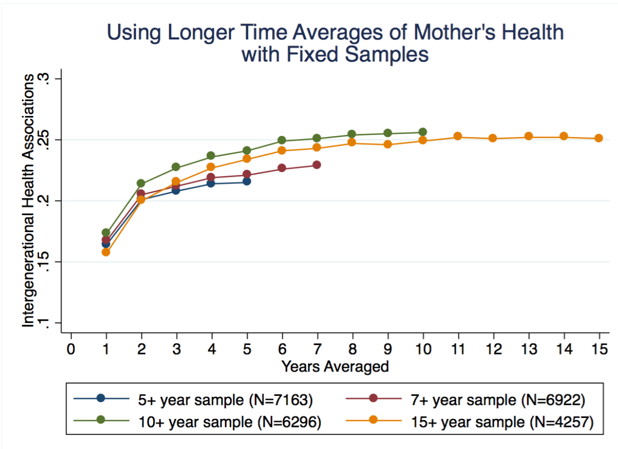
(c) Rank mobility for mothers and daughters



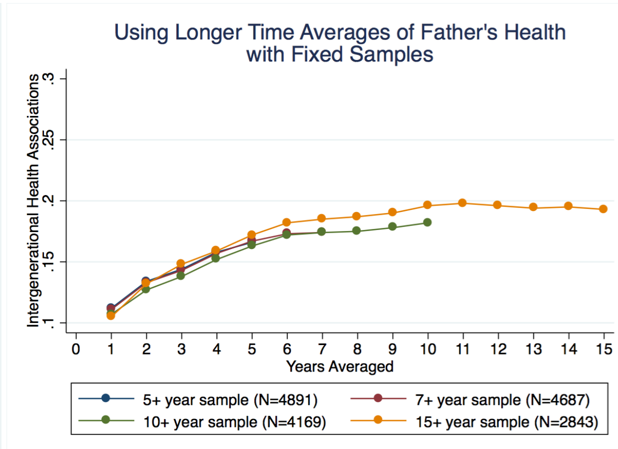
(d) Rank mobility for fathers and daughters

Figure A.5 plots the mean child percentile income rank at each percentile of the parent income distribution for each parent-child sample. The red line in each graph is the estimated regression line from the weighted bivariate regression of child rank on parent rank for that sample. The rank-rank slope is the coefficient on parent income percentile. The expected rank at the 25th (or 75th) percentile is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent income rank distribution. Income percentile ranks are constructed from the time-averaged total family income adjusted for age, family size and inflation and are ranked separately by gender within each generation. All means and regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

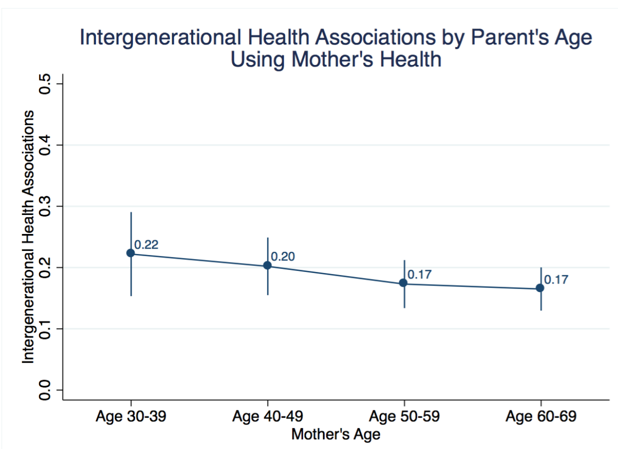
Figure A.6: Robustness of intergenerational health associations



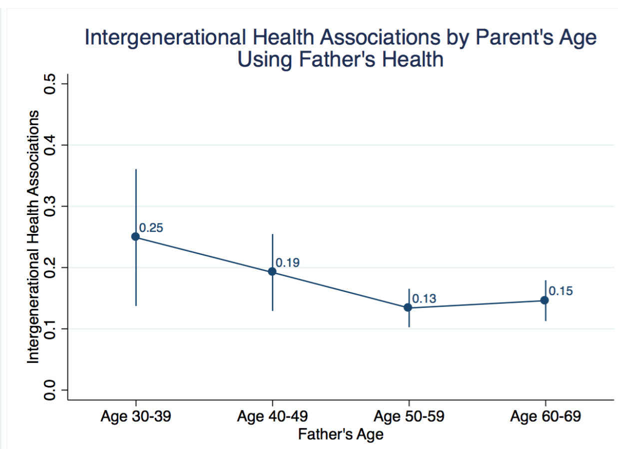
(a) Attenuation bias: varying years of parent health measurement using mother's health



(b) Attenuation bias: varying years of parent health measurement using father's health

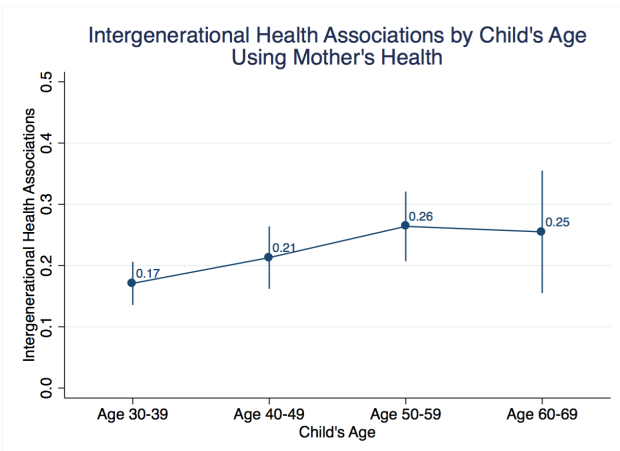


(c) Life cycle bias: varying age of mother's health measurement

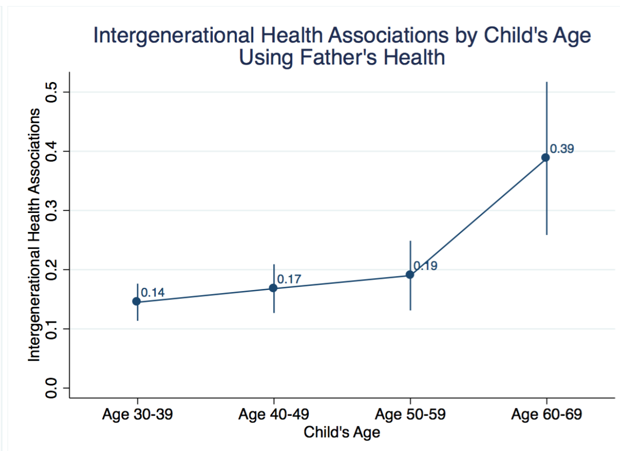


(d) Life cycle bias: varying age of father's health measurement

Figure A.6: Robustness of intergenerational health associations – Continued



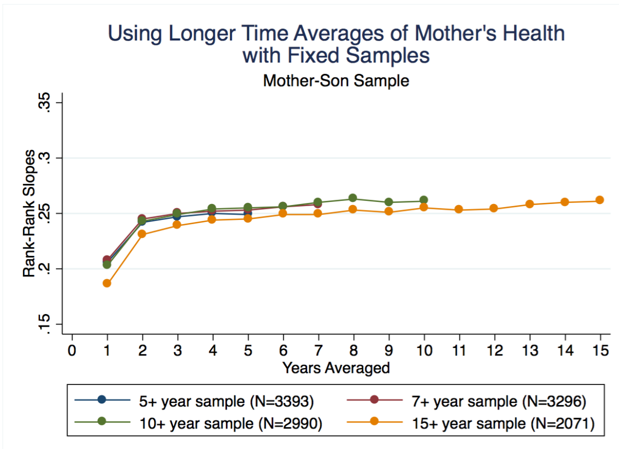
(e) Life cycle bias: varying age of child's health measurement using mother's health



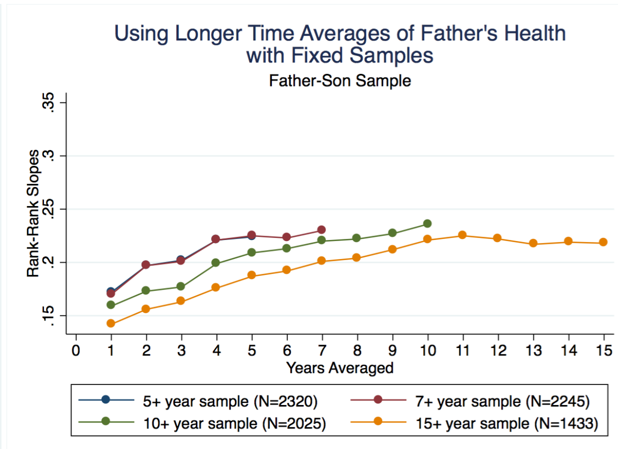
(f) Life cycle bias: varying age of child's health measurement using father's health

Figure A.6 evaluates the robustness of the estimates of intergenerational health associations to attenuation and life cycle biases. Panels A and B plot the intergenerational health associations using varying time averages of mother (Panel A) and fathers (Panel B) health within fixed samples of children with parents with at least 5, 7, 10, or 15 years of health observations. The number of observations for each fixed sample is reported in parentheses. Panels C and D plot the intergenerational health associations using parent's health observations within the 10-year age bins and all available child health observations over age of 30. Panels E and F plot the intergenerational health associations using child's health observations within the 10-year age bins and all available parent health observations over age of 30. In all specifications in Figure A.6, the intergenerational health associations are estimated using the pooled sample of children, which includes both sons and daughters and include as controls the quadratic age terms of parent and child. Age for both generations is defined as the time-averaged age of the individual at the time of the utilized health observations. All regressions are weighted using the most recently available individual sampling weights of the child.

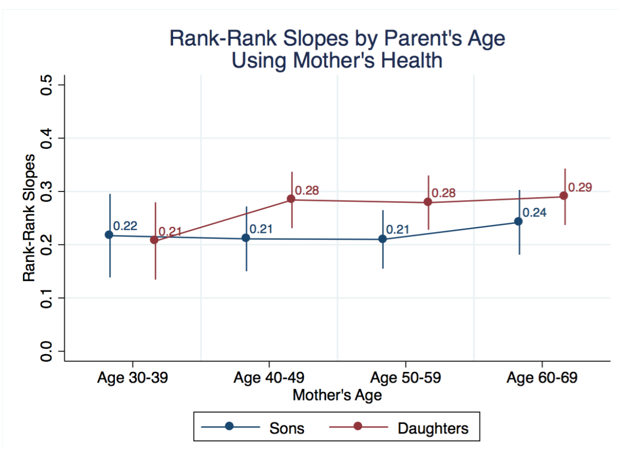
Figure A.7: Additional robustness figures of rank-rank slopes



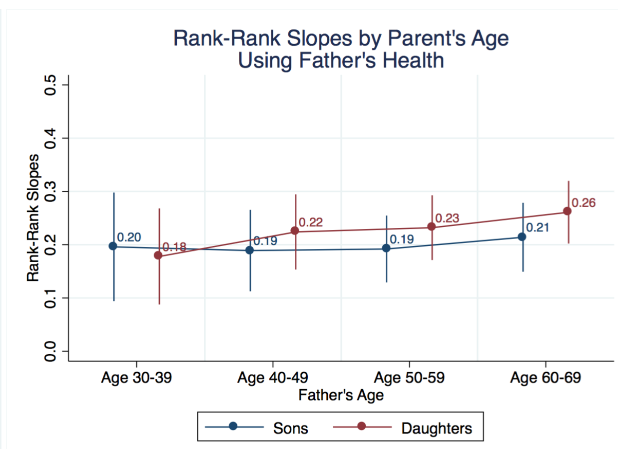
(a) Attenuation bias: varying years of parent health measurement for mothers and sons



(b) Attenuation bias: varying years of parent health measurement for fathers and sons



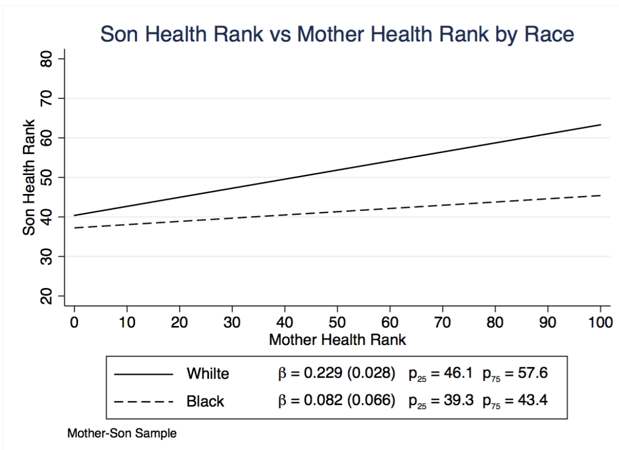
(c) Life cycle bias: varying age of mother's health measurement



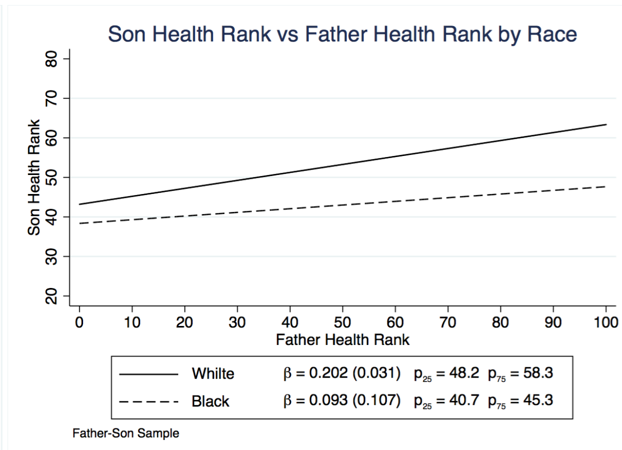
(d) Life cycle bias: varying age of father's health measurement

Figure A.7 evaluates the robustness of the estimates of rank-rank slopes to attenuation and life cycle biases. Panels A and B plot the rank-rank slopes using varying time averages of mother and fathers (Panel B and D) health within fixed samples of sons with parents with at least 5, 7, 10, or 15 years of health observations. The number of observations for each fixed sample is reported in parentheses. Panels C and D plot the rank-rank slopes using parent's health observations within the 10-year age bins and all available child health observations over age of 30. In all specifications in Figure A.7, the rank-rank slopes are estimated from weighted bivariate regressions of child health rank on parent health rank using the most recently available individual sampling weights of the child. Age adjustment and percentile ranks are done separately for each alternative parent and child health measure.

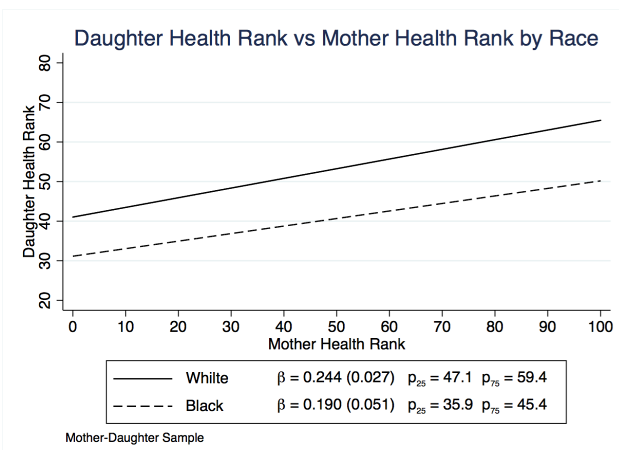
Figure A.8: Health rank mobility by race



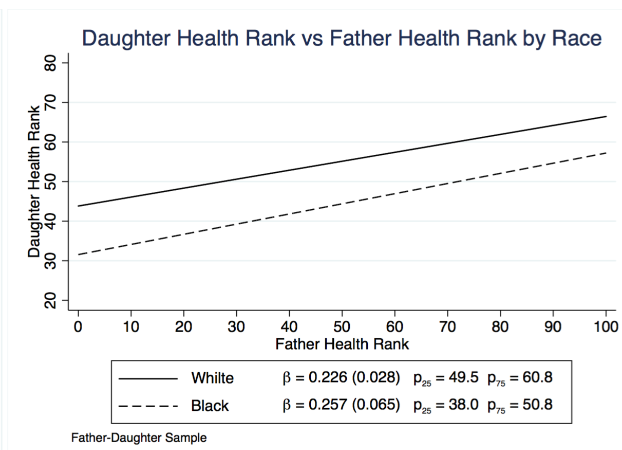
(a) Rank mobility by race for mothers and sons



(b) Rank mobility by race for fathers and sons



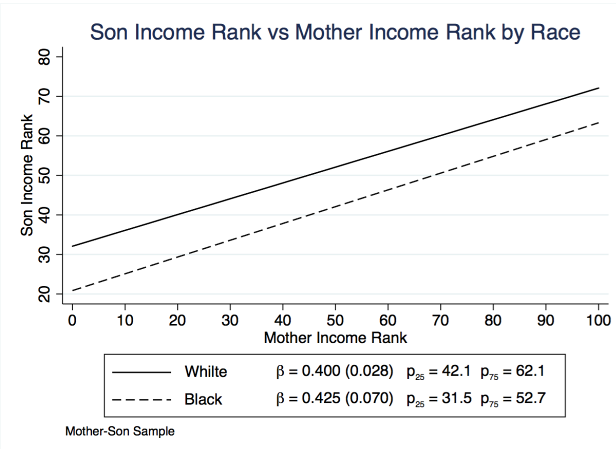
(c) Rank mobility by race for mothers and daughters



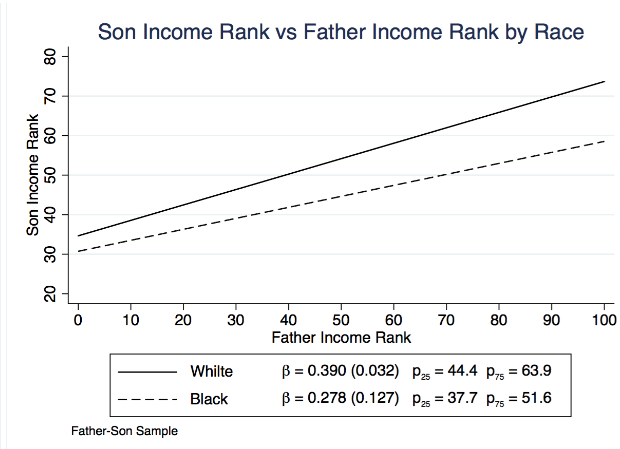
(d) Rank mobility by race for fathers and daughters

Figure A.8 plots estimated regression lines from the weighted bivariate regressions of child rank on parent rank by race for each parent-child sample. Race refers to the reported race of the child. The rank-rank slope, denoted by β, is the coefficient on parent health percentile. The expected rank at the 25th (or 75th) percentile, denoted by $p_{25}(p_{75})$, is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent health rank distribution. Health percentile ranks are constructed from the age-adjusted baseline health measure and are ranked separately by gender within each generation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

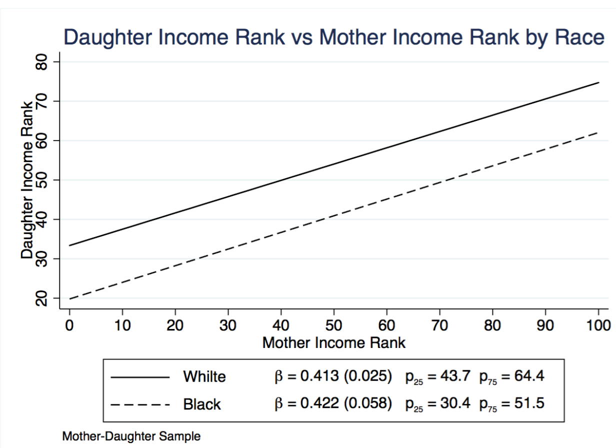
Figure A.9: Income rank mobility by race



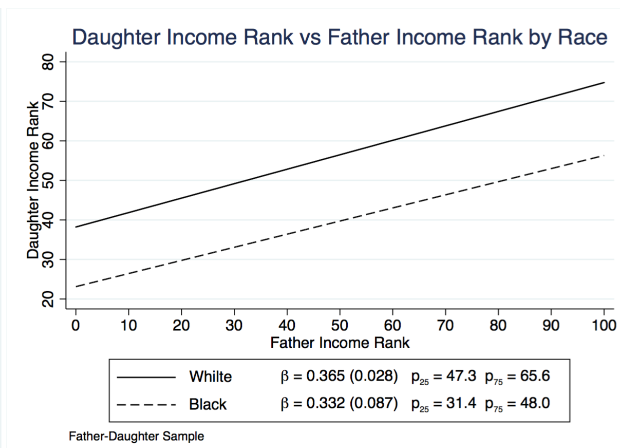
(a) Rank mobility by race for mothers and sons



(b) Rank mobility by race for fathers and sons



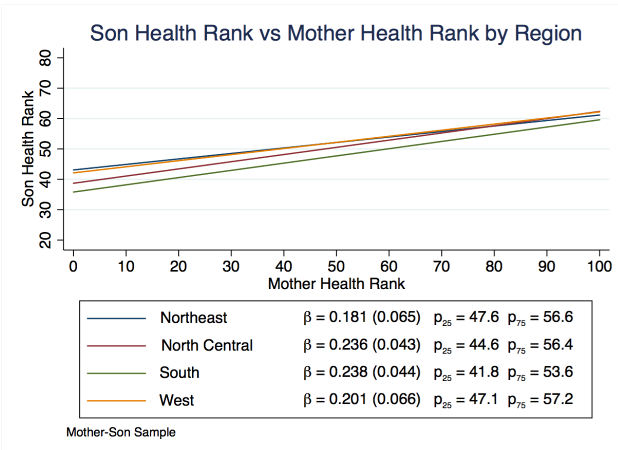
(c) Rank mobility by race for mothers and daughters



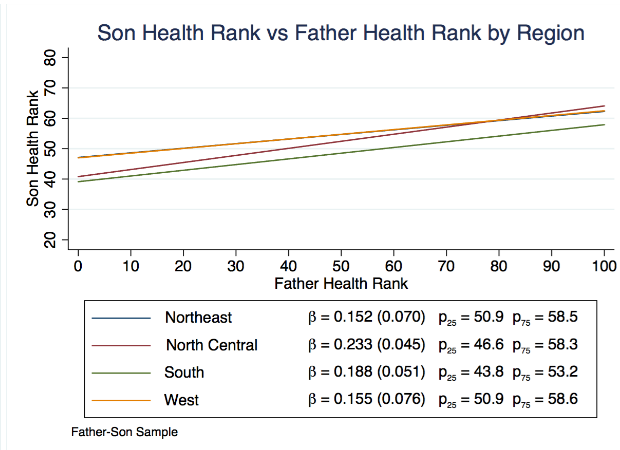
(d) Rank mobility by race for fathers and daughters

Figure A.9 plots estimated regression lines from the weighted bivariate regressions of child rank on parent rank by race for each parent-child sample. Race refers to the reported race of the child. The rank-rank slope, denoted by β, is the coefficient on parent income percentile. The expected rank at the 25th (or 75th) percentile, denoted by $p_{25}(p_{75})$, is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent income rank distribution. Income percentile ranks are constructed from the time-averaged total family income measure after adjusting for age, family size and inflation and are ranked separately by gender within each generation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

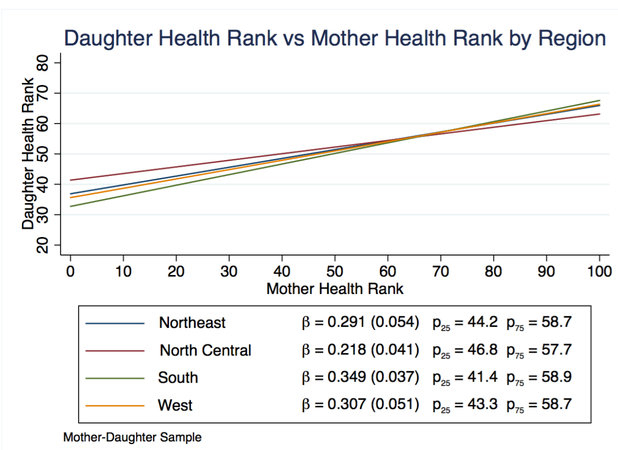
Figure A.10: Health rank mobility by childhood region



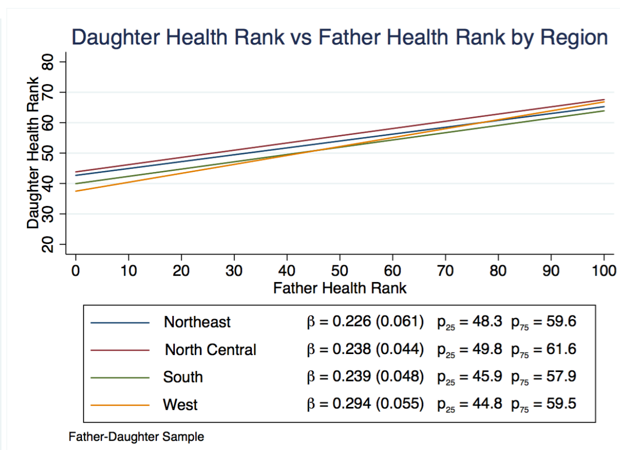
(a) Rank mobility by region for mothers and sons



(b) Rank mobility by region for fathers and sons



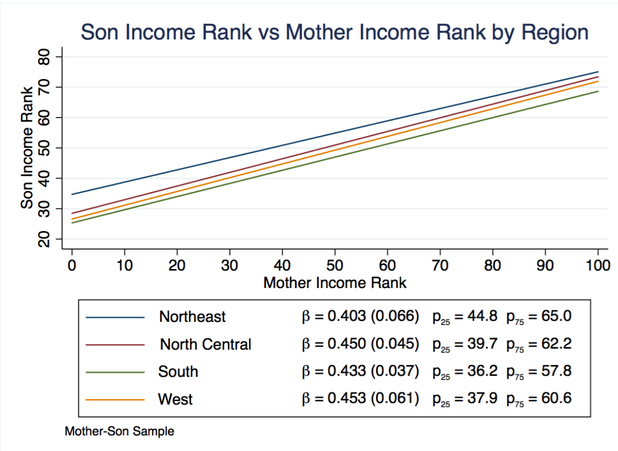
(c) Rank mobility by region for mothers and daughters



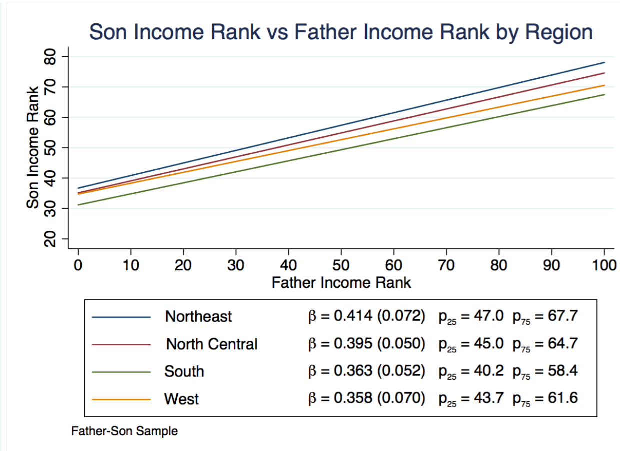
(d) Rank mobility by region for fathers and daughters

Figure A.10 plots estimated regression lines from the weighted bivariate regressions of child rank on parent rank by childhood region for each parent-child sample. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. The rank-rank slope, denoted by β, is the coefficient on parent health percentile. The expected rank at the 25th (or 75th) percentile, denoted by $p_{25}(p_{75})$, is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent health rank distribution. Health percentile ranks are constructed from the age-adjusted baseline health measure and are ranked separately by gender within each generation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

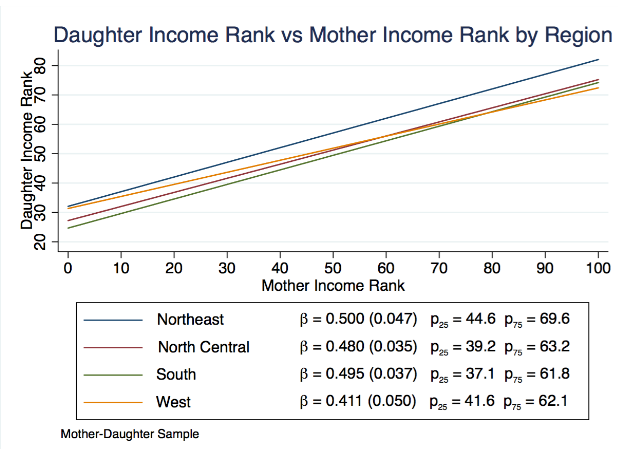
Figure A.11: Income rank mobility by childhood region



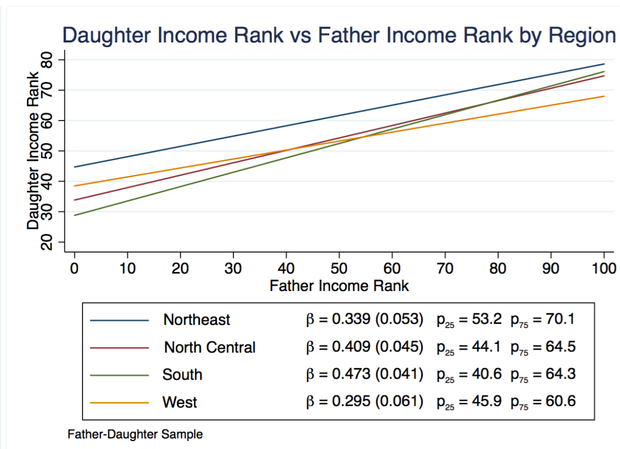
(a) Rank mobility by region for mothers and sons



(b) Rank mobility by region for fathers and sons



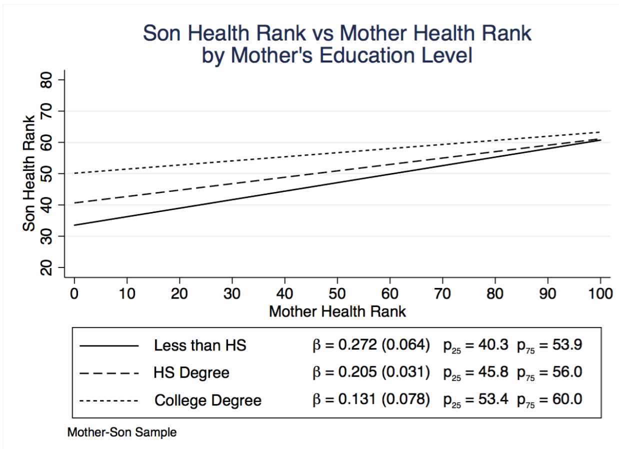
(c) Rank mobility by region for mothers and daughters



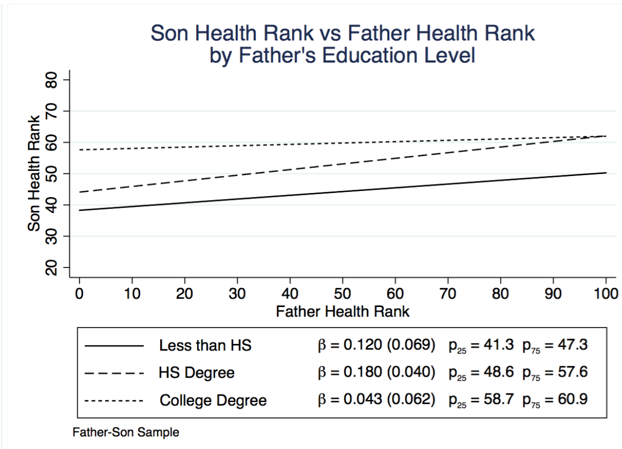
(d) Rank mobility by region for fathers and daughters

Figure A.11 plots estimated regression lines from the weighted bivariate regressions of child rank on parent rank by childhood region for each parent-child sample. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. The rank-rank slope, denoted by β, is the coefficient on parent health percentile. The expected rank at the 25th (or 75th) percentile, denoted by $p_{25}(p_{75})$, is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent income rank distribution. Income percentile ranks are constructed from the time-averaged total family income measure after adjusting for age, family size and inflation and are ranked separately by gender within each generation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

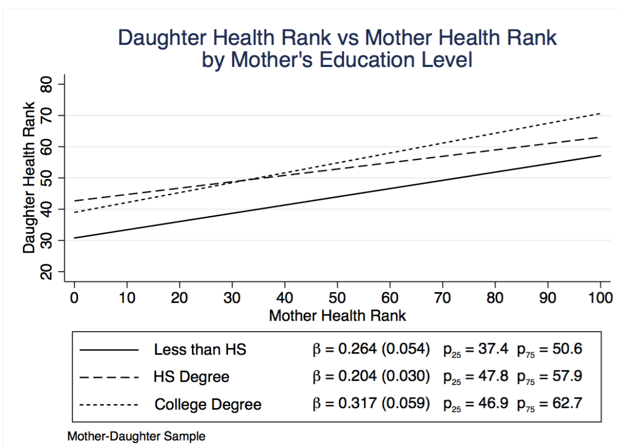
Figure A.12: Health rank mobility by parent's education level



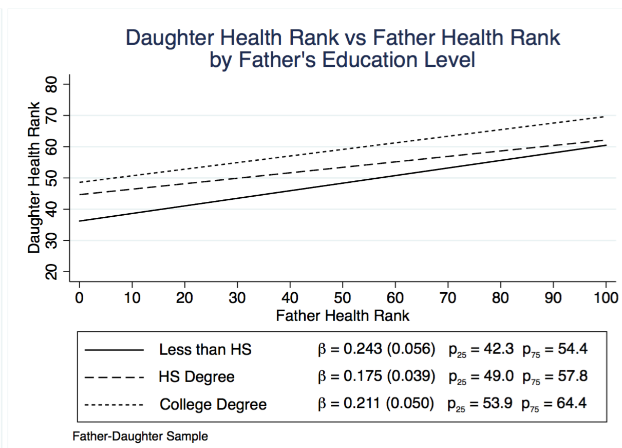
(a) Rank mobility by mother's education for mothers and sons



(b) Rank mobility by father's education for fathers and sons



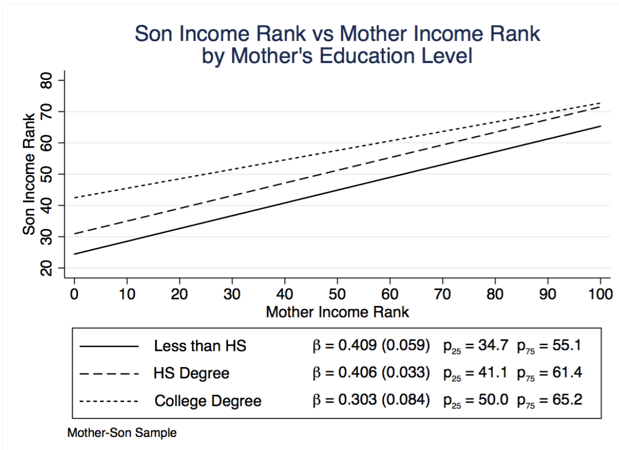
(c) Rank mobility by mother's education for mothers and daughters



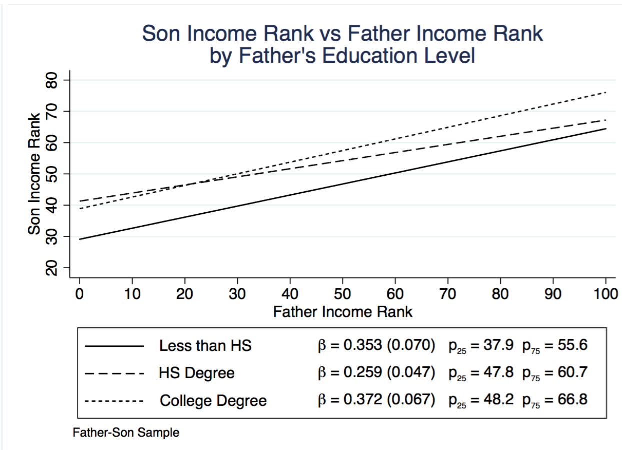
(d) Rank mobility by father's education for fathers and daughters

Figure A.12 plots estimated regression lines from the weighted bivariate regressions of child rank on parent rank by parental education for each parent-child sample. Education refers to the parent's education level. In the sample with mothers, it refers to the mother's highest level of education in the most recently available survey. In the samples with fathers, it refers to father's highest level of education in the most recently available survey. The rank-rank slope, denoted by β, is the coefficient on parent health percentile. The expected rank at the 25th (or 75th) percentile, denoted by $p_{25}(p_{75})$, is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent health rank distribution. Health percentile ranks are constructed from the age-adjusted baseline health measure and are ranked separately by gender within each generation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

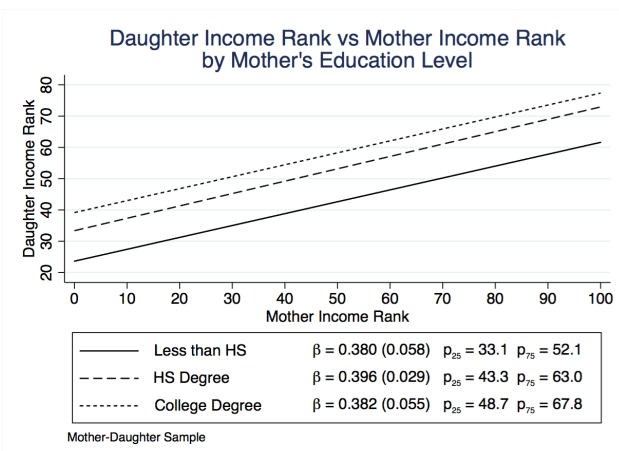
Figure A.13: Income rank mobility by parent's education level



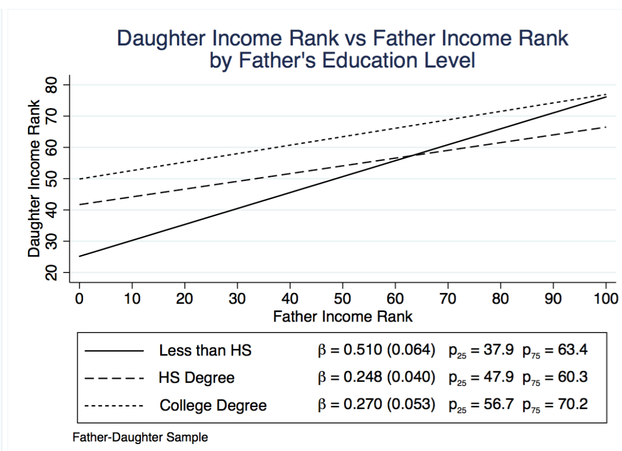
(a) Rank mobility by mother's education for mothers and sons



(b) Rank mobility by father's education for fathers and sons



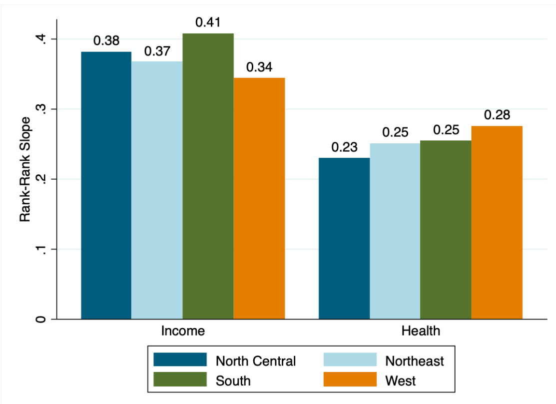
(c) Rank mobility by mother's education for mothers and daughters



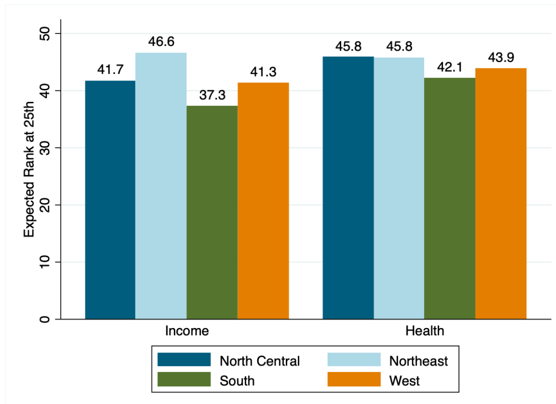
(d) Rank mobility by father's education for fathers and daughters

Figure A.13 plots estimated regression lines from the weighted bivariate regressions of child rank on parent rank by parental education for each parent-child sample. Education refers to the parent's education level. In the sample with mothers, it refers to the mother's highest level of education in the most recently available survey. In the samples with fathers, it refers to father's highest level of education in the most recently available survey. The rank-rank slope, denoted by β, is the coefficient on parent income percentile. The expected rank at the 25th (or 75th) percentile, denoted by $p_{25}(p_{75})$, is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent income rank distribution. Income percentile ranks are constructed from the time-averaged total family income measure after adjusting for age, family size and inflation and are ranked separately by gender within each generation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

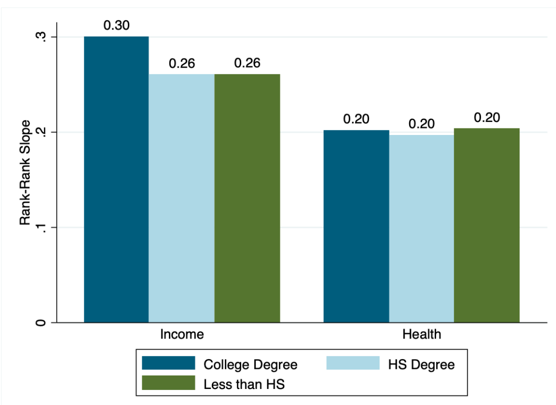
Figure A.14: Health and income rank mobility by region and education



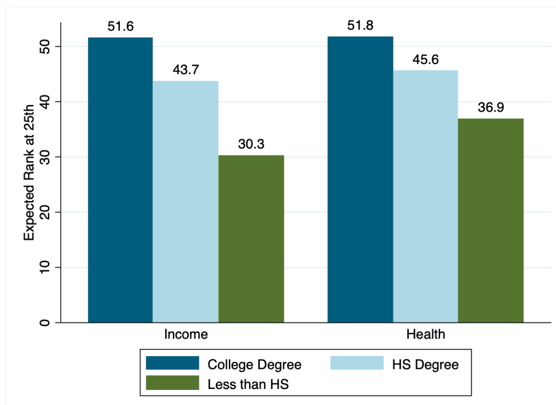
(a) Rank-rank slope by region



(b) Expected rank at 25th percentile by region



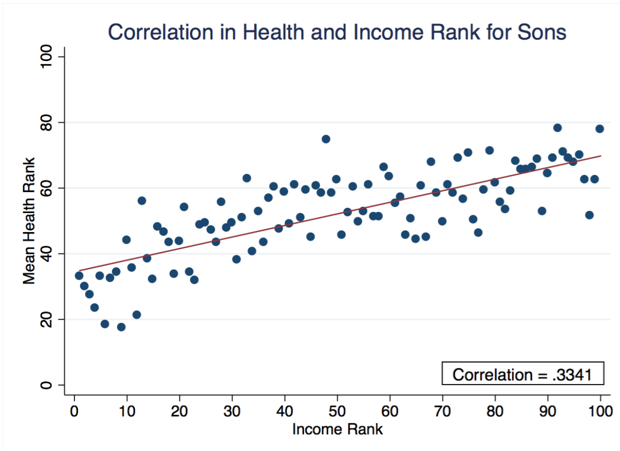
(c) Rank-rank slope by parent's education



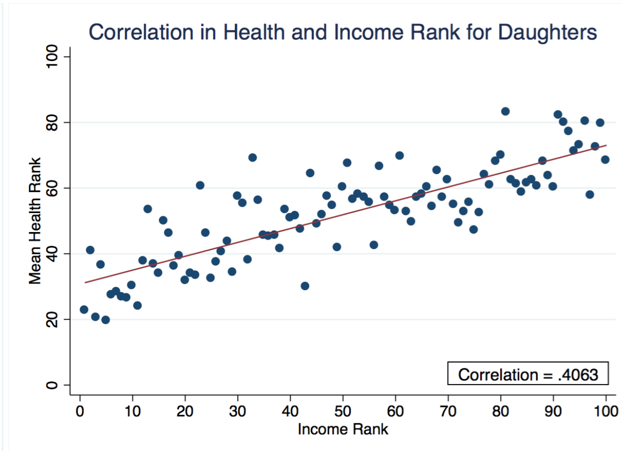
(d) Expected rank at 25th percentile by region

Figure A.14 plots the rank-rank slope coefficients and expected rank at the 25th percentile from the weighted bivariate regressions of child rank on parent rank by childhood region, and education using both parents' health for all children. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. REducation refers to the highest level attained by at least one of the parents in the most recently available survey. The rank-rank slope, denoted by β, is the coefficient on parent health percentile. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately for each generation. Income percentile ranks are constructed from the time-averaged total family income adjusted for age, family size and inflation and are ranked separately for each generation. All regressions are weighted using the most recently available individual sampling weights of the child. Standard errors for the regression coefficients (in parentheses) are robust to heteroskedasticity and within-family correlation.

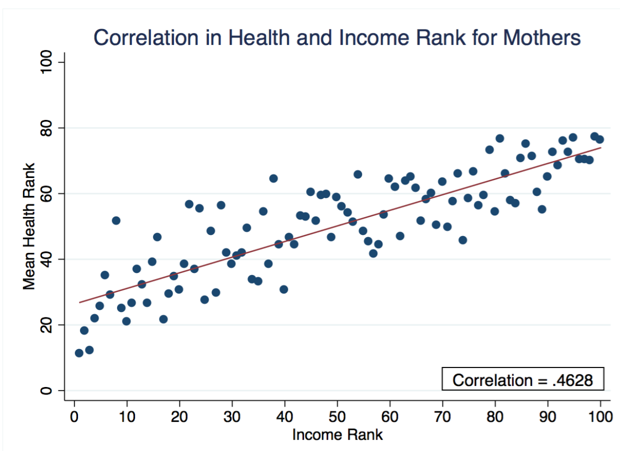
Figure A.15: Correlation in health and income rank by generation



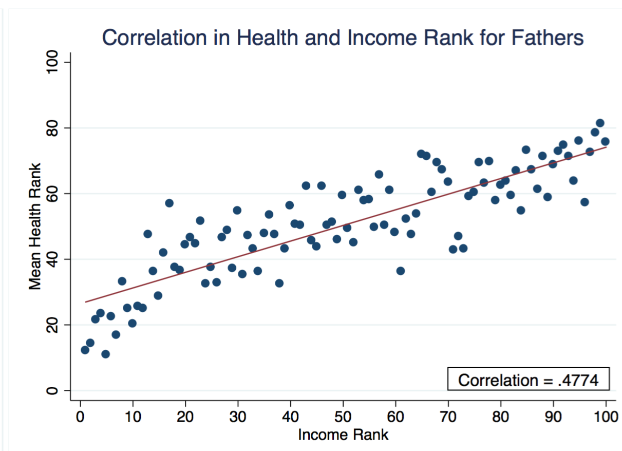
(a) Sons



(b) Daughters



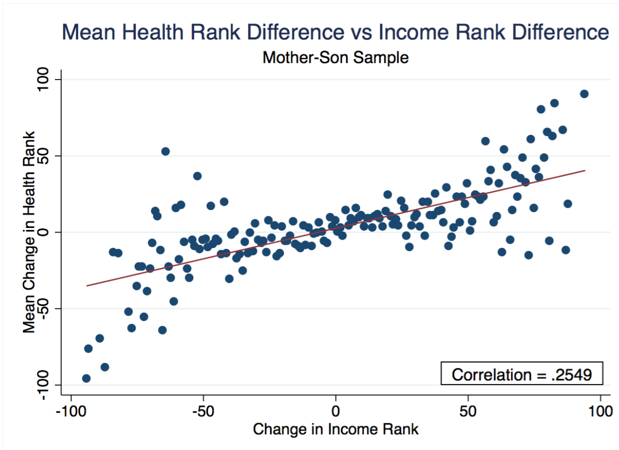
(c) Mothers



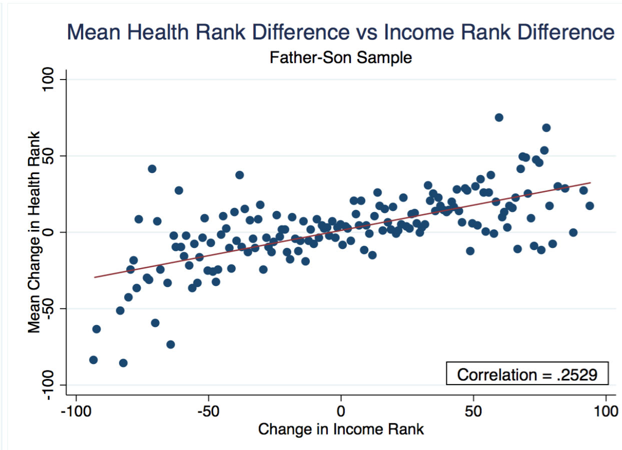
(d) Fathers

Figure A.15 plots the mean health rank at each percentile of the income rank distribution for sons (Panel A), daughters (Panel B), mothers (Panel C) and fathers (Panel D). Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately by gender within each generation. Income percentile ranks are constructed from time-averaged total family income after adjusting for age, family size and inflation. The red line in each graph is the fitted line. Correlation between health and income rank at the individual level for each subsample is reported. All means and correlations are weighted using the most recently available individual sampling weights.

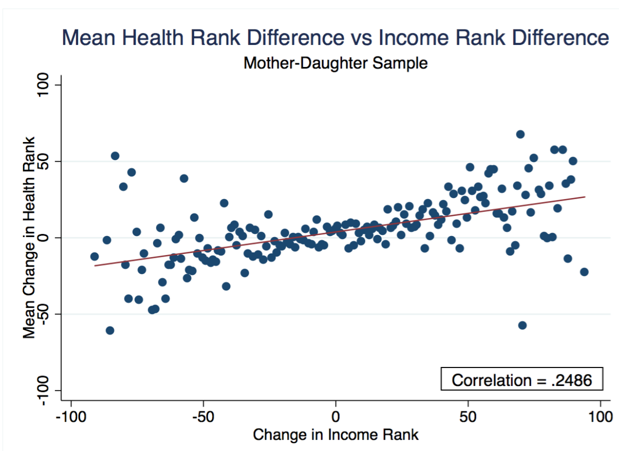
Figure A.16: Correlation in health and income rank mobility by generation



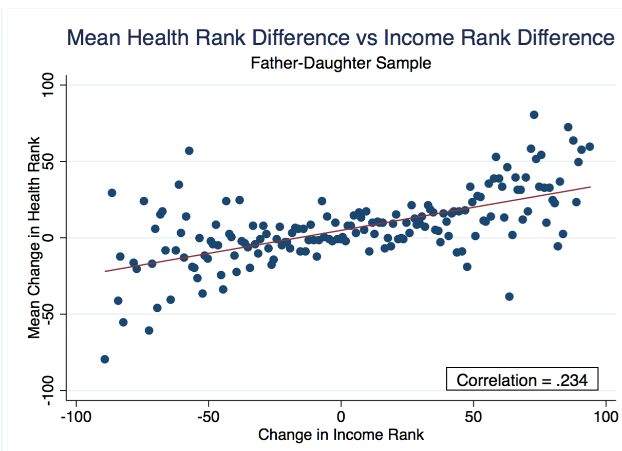
(a) Mothers and sons



(b) Fathers and sons



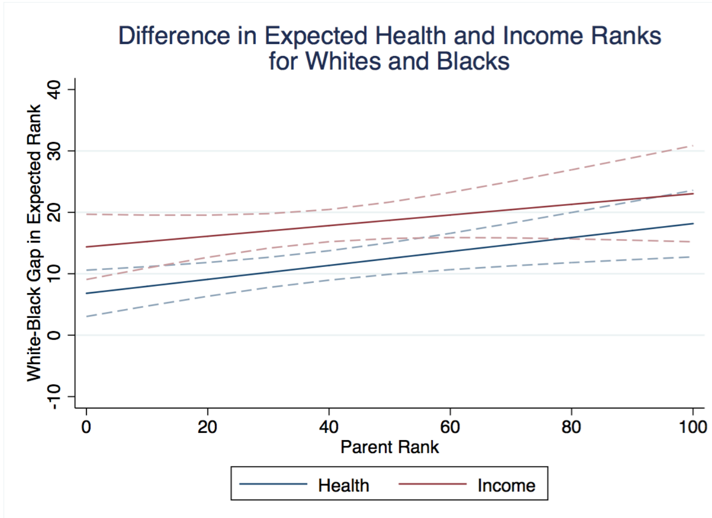
(c) Mothers and daughters



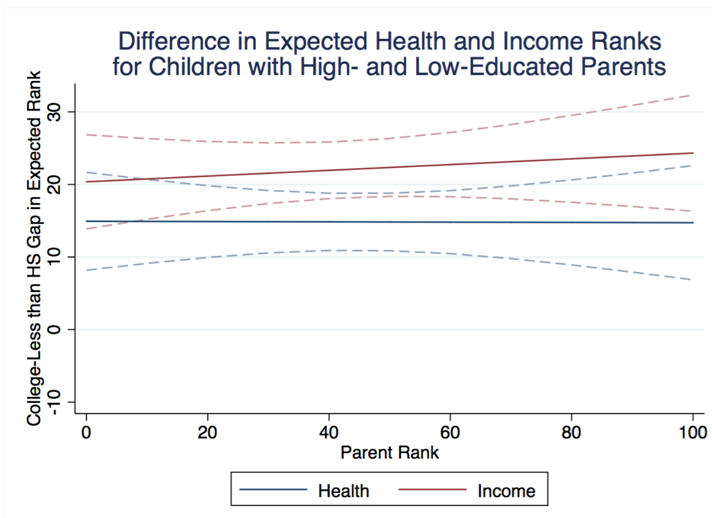
(d) Fathers and daughters

Figure A.16 plots the mean change in health rank at each percentile change of the income rank distribution for each parent-child sample. Change in health (income) rank is the difference between child's health (income) percentile rank and parent's health (income) percentile rank. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately by gender within each generation. Income percentile ranks are constructed from time-averaged total family income after adjusting for age, family size and inflation. The red line in each graph is the fitted line. Correlation between change in health rank and change in income rank at the individual level for each subsample is reported. All means and correlations are weighted using the most recently available individual sampling weights of the child.

Figure A.17: Difference in health and income mobility by race and education



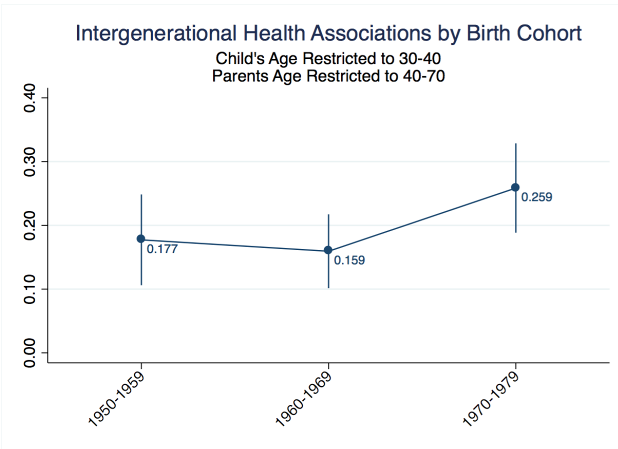
(a) Difference by race



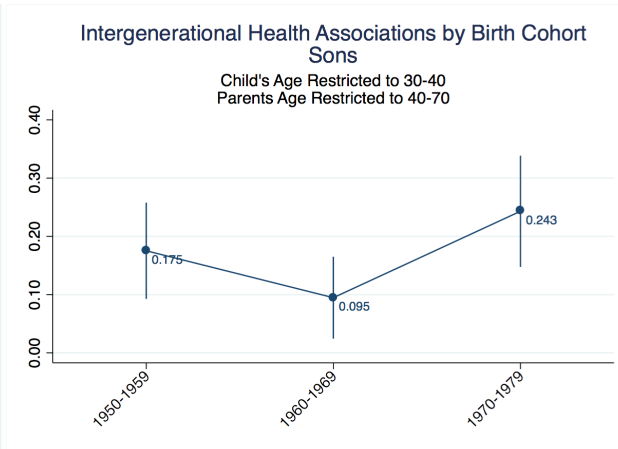
(b) Difference by parent educational level

Panel A of Figure A.17 plots the difference in expected rank between whites and blacks for health and income along the parent rank distribution. Panel B plots the difference in expected rank between children with parents with college degree and children with parents with less than high school degree for health and income. The predicted ranks are estimated from the weighted bivariate regressions of child rank on parent rank by race or education for all children using both parent's health or income measure. Race refers to the reported race of the child. Parent education is the highest level of education attained by at least one of the parent. Health percentile ranks are constructed from the age-adjusted baseline health measure and are ranked separately within each generation. Income percentile ranks are constructed from the time-averaged total family income measure after adjusting for age, family size and inflation and are ranked separately within each generation. All regressions are weighted using the most recently available individual sampling weights of the child. 95% confidence interval bands are shown calculated using standard errors that are robust to heteroskedasticity and within-family correlation.

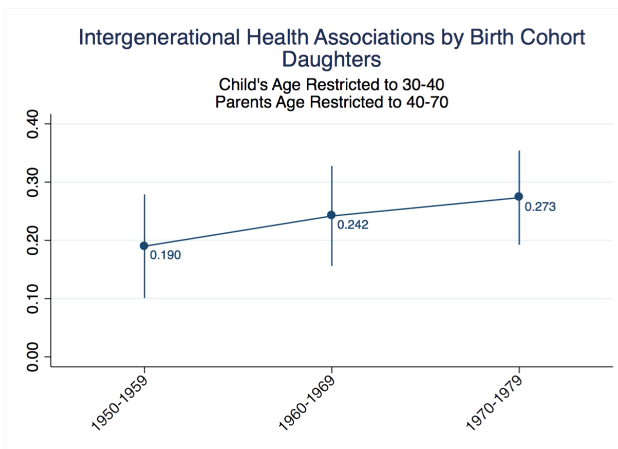
Figure A.18: Trends in intergenerational health associations



(a) All children



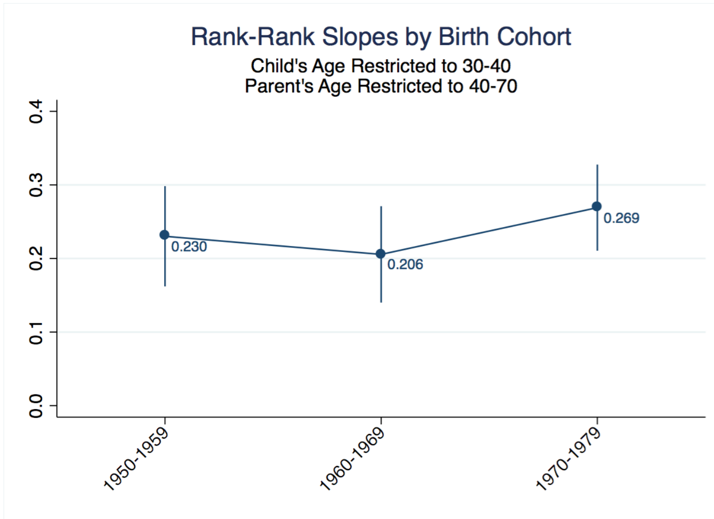
(b) Sons



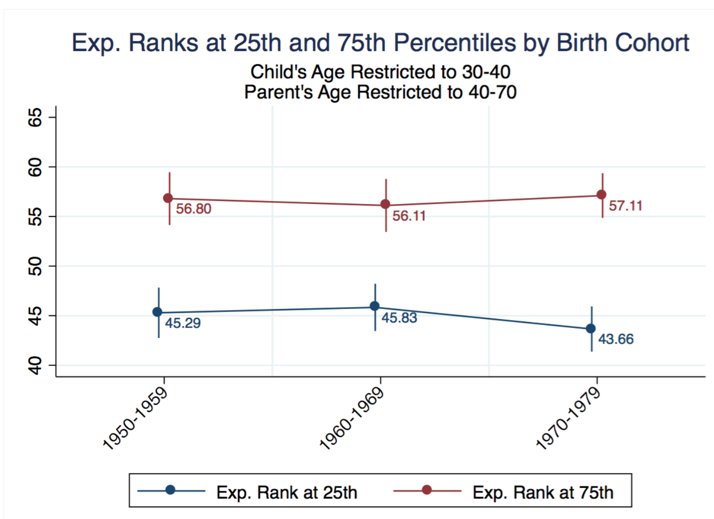
(c) Daughters

Figure A.18 plots the intergenerational health associations by child's birth cohort (1950-1959, 1960-1969, 1970-1979) for all children (Panel A), sons (Panel B) and daughters (Panel C). The intergenerational health associations are estimated using all available health measurements that are between age 30 and 40 for the child's health measure and all available health measurements that are between age 40 and 70 for the parent's health measure. The dependent variable for all specifications is the child's time-averaged continuous health measure. The parent health measure is the average of the mother's and father's health if available. Otherwise, only one parent's health measure is used. All specifications include as controls the quadratic age terms of the mother, father and child, and missing indicators for mother and father. Age for both generations is defined as the time-averaged age of the individual at the time of health observations. All regressions are weighted using sampling weights of the most recently available individual weights for the child.

Figure A.19: Trends in health rank mobility



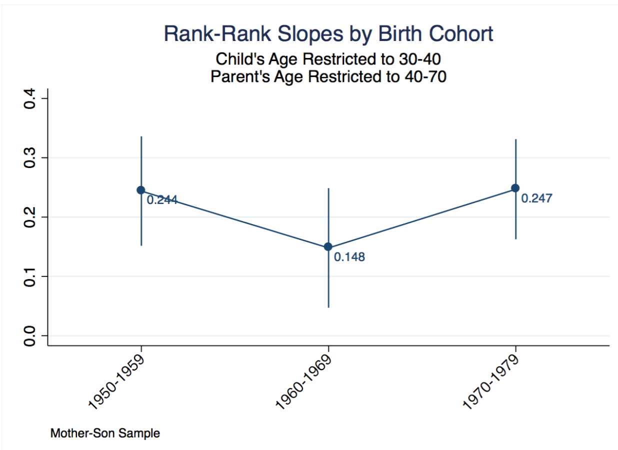
(a) Rank-rank slopes by birth cohort



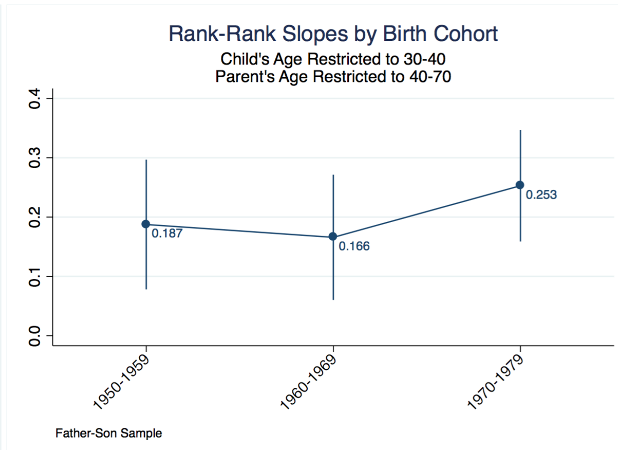
(b) Expected ranks at 25th and 75th percentiles by birth cohort

Figure A.19 plots the rank-rank slopes (Panel A), expected ranks at the 25th and 75th health percentile (Panel B) by child's birth cohort (1950-1959, 1960-1969, 1970-1979) using both parents' health for all children. The rank-rank slope is the coefficient on parent health percentile from the bivariate regression of child rank on parent rank. The expected rank at the 25th (or 75th) percentile is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent health rank distribution. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately by birth cohort within each generation. Child's health measure is the average of all available health measurements that are between age 30 and 40 and parents' health measure is the average of all available health measurements that are between age 40 and 70. All regressions are weighted using the most recently available individual sampling weights of the child.

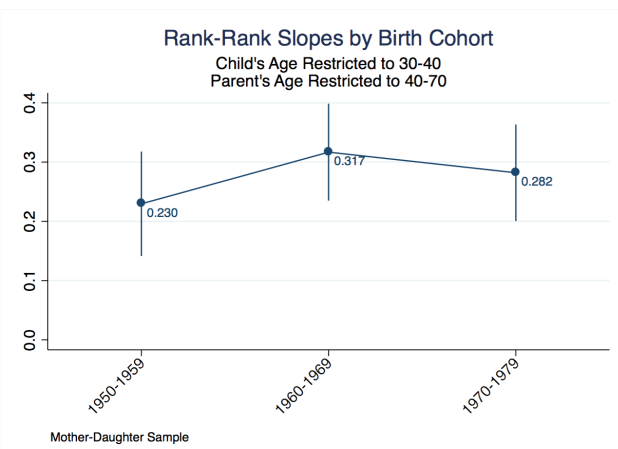
Figure A.20: Trends in health rank mobility



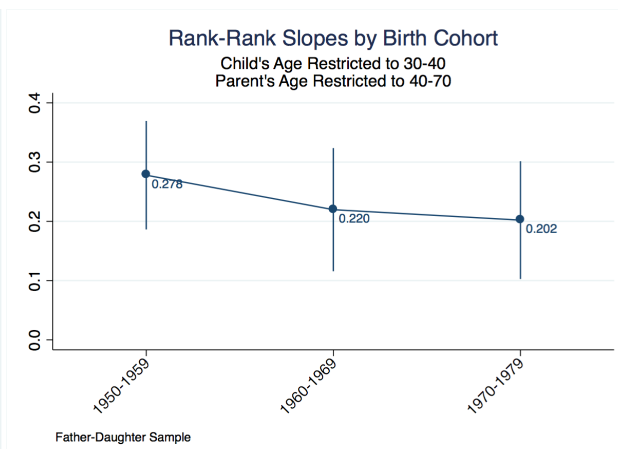
(a) Rank-rank slopes by birth cohort for mothers and sons



(b) Rank-rank slopes by birth cohort for fathers and sons

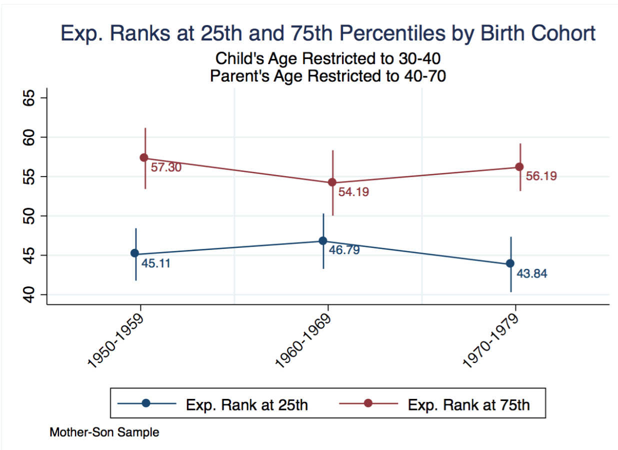


(c) Rank-rank slopes by birth cohort for mothers and daughters

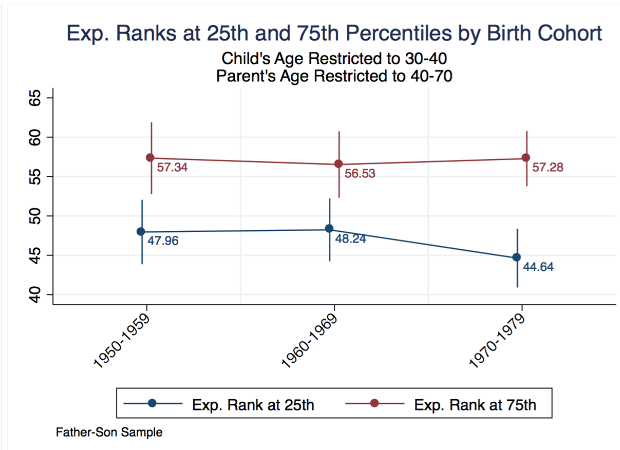


(d) Rank-rank slopes by birth cohort for fathers and daughters

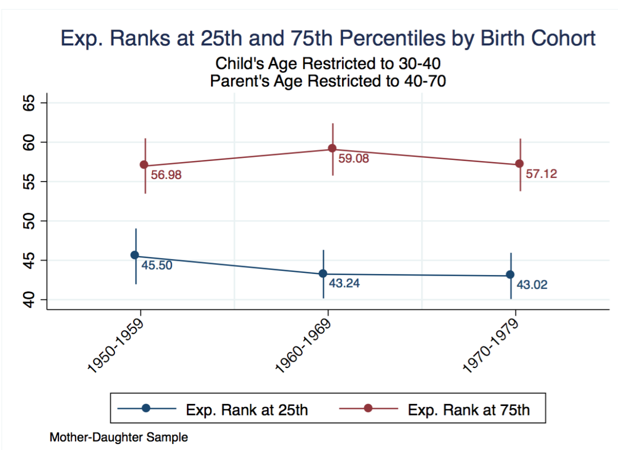
Figure A.20: Trends in health rank mobility – Continued



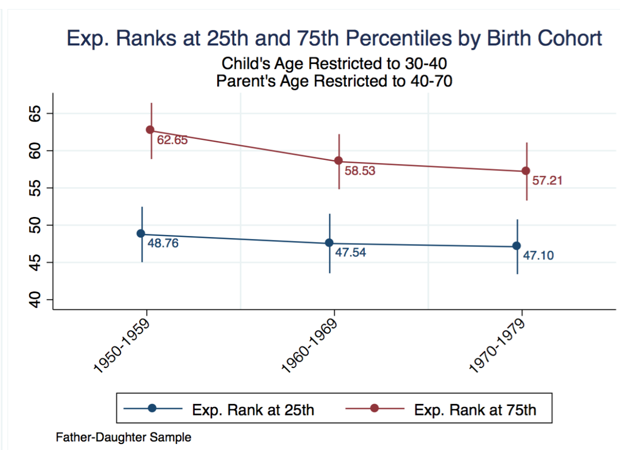
(e) Expected ranks at the 25th and 75th percentiles for mothers and sons



(f) Expected ranks at the 25th and 75th percentiles for fathers and sons



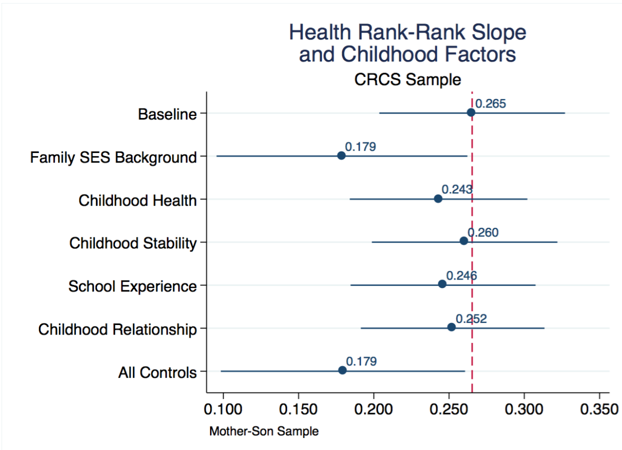
(g) Expected ranks at the 25th and 75th percentiles for mothers and daughters



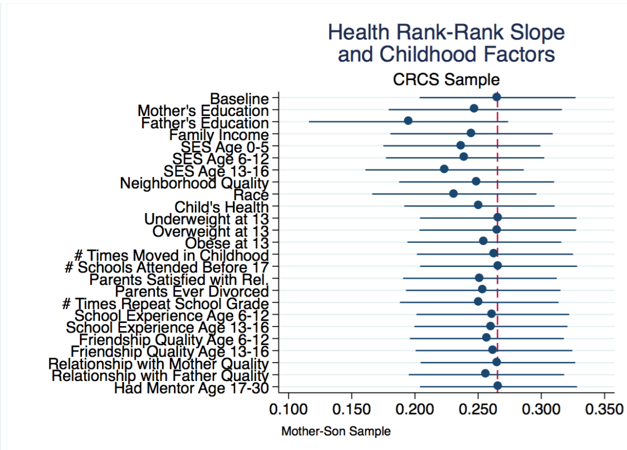
(h) Expected ranks at the 25th and 75th percentiles for fathers and daughters

Figure A.20 plots the rank-rank slopes (Panels A to D), expected ranks at the 25th and 75th health percentile (Panels E to H) by child's birth cohort (1950-1959, 1960-1969, 1970-1979). The rank-rank slope is the coefficient on parent health percentile from the bivariate regression of child rank on parent rank. The expected rank at the 25th (or 75th) percentile is the predicted rank from the rank-rank specification for a child with a parent at the 25th (or 75th) percentile of the parent health rank distribution. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately by birth cohort and gender within each generation. Child's health measure is the average of all available health measurements that are between age 30 and 40 and parent's health measure is the average of all available health measurements that are between age 40 and 70. All regressions are weighted using the most recently available individual sampling weights of the child.

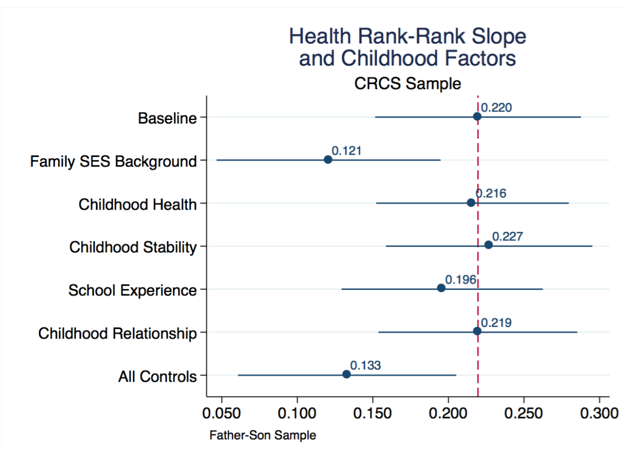
Figure A.21: Effect of childhood factors on rank-rank slopes by parent-child samples



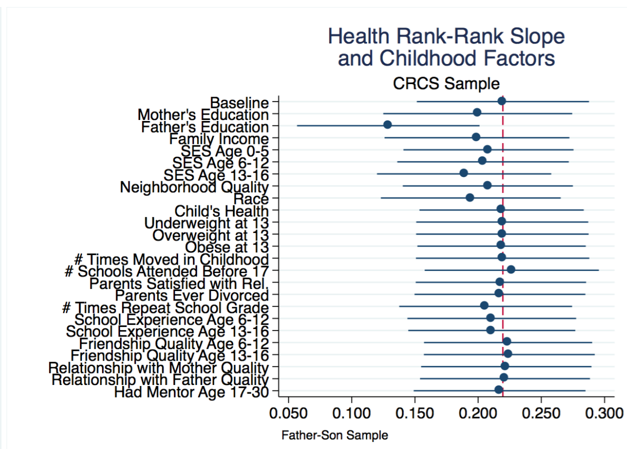
(a) Mothers and sons



(b) Mothers and sons

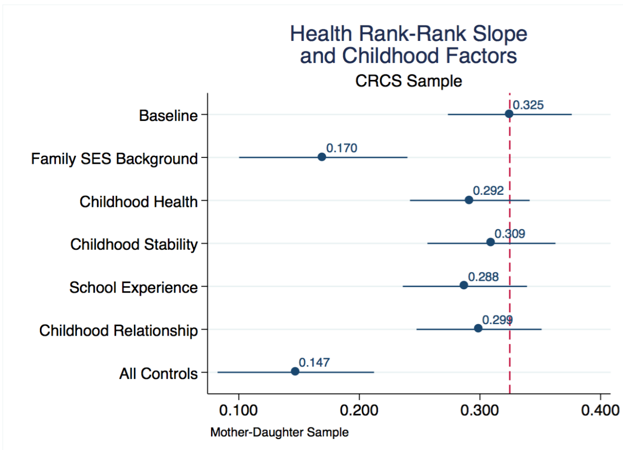


(c) Fathers and sons

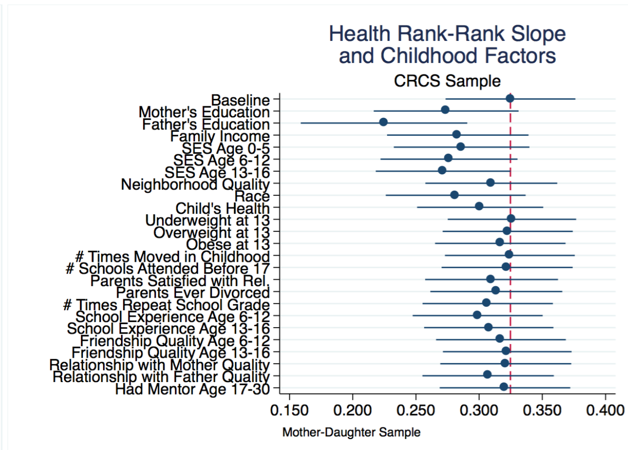


(d) Fathers and sons

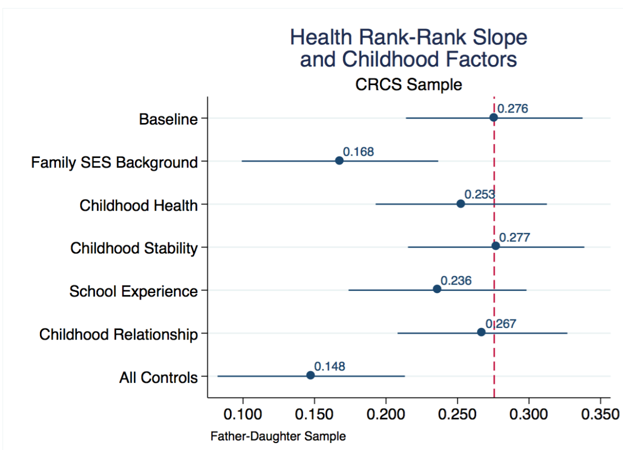
Figure A.21: Effect of childhood factors on rank-rank slopes by parent-child samples – Continued



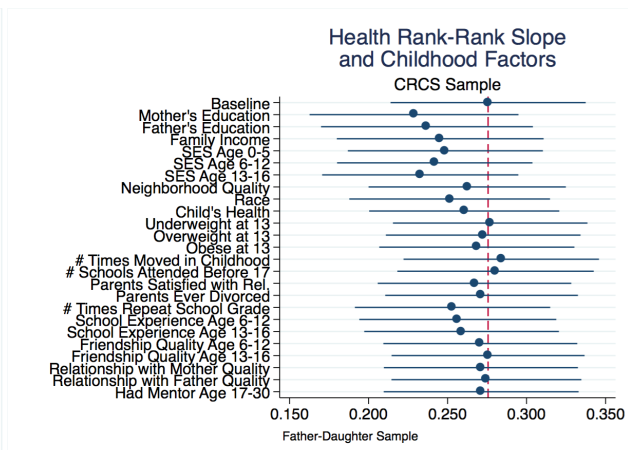
(e) Mothers and daughters



(f) Mothers and daughters



(g) Fathers and daughters



(h) Fathers and daughters

Figure A.21 shows how the baseline rank-rank slope is attributable to various childhood factors for the sample of individuals in the child generation who were also part of the 2014 Childhood Retrospective Circumstance Study (CRCS). Panels A, C, and E plot the rank-rank slopes as groups of childhood factors are added to the baseline bivariate regression of child's health rank on parent's health rank. Family SES Background includes mother's years of education, father's years of education, family income, SES Index Age 0-5, SES Index Age 6-12, SES Age 13-16, Neighborhood Quality Index, and controls for race of child (white, black or other). Childhood Health includes Child Health Index, Underweight at 13, Overweight at 13, and Obese at 13. Childhood Stability includes number of times moved in childhood, number of schools attended before 17, if parents were satisfied with their relationship, and if parents ever divorced. School Experience includes number of times repeat school grade, School Experience Index Age 6-12, School Experience Age 13-16. Childhood Relationship includes Friendship Quality Index Age 6-12, Friendship Quality Index Age 13-16, Relationship with Mother Quality Index, Relationship with Father Quality Index, and having a mentor at age 17-30. Panels B, D, F plot the rank-rank slopes as individual childhood factors are added to the baseline regression. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately by gender within each generation. The red dashed lines denote the baseline rank-rank slope. Additional details on the CRCS variables can be found in Appendix A. All regressions are weighted using individual CRCS sampling weights of the child. 95% confidence intervals are shown calculated using standard errors that are robust to heteroskedasticity and within-family correlation.

Figure A.22: Likelihood of Observing Health Status by Age

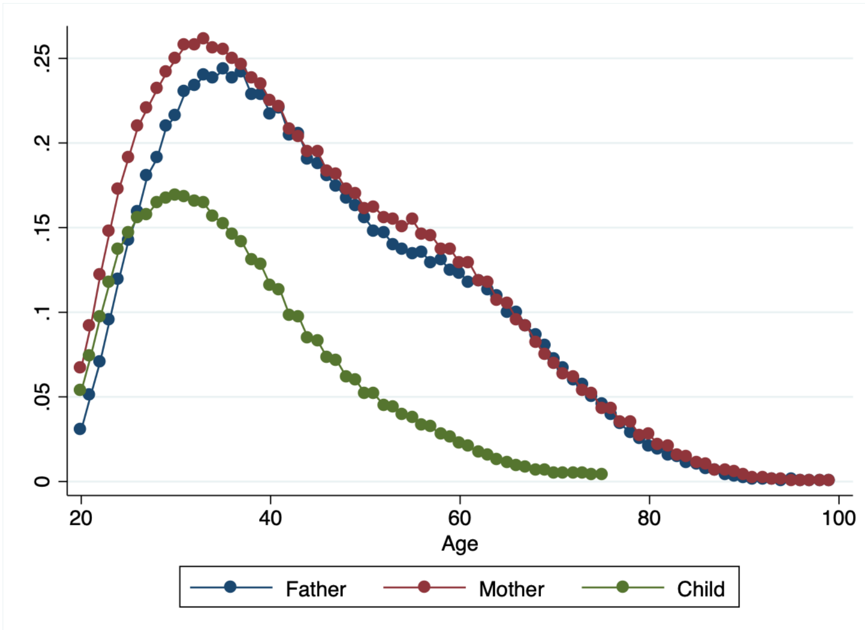


Figure A.22 plots the unweighted probability of observing a health measurement by age for mothers, fathers and children.

Figure A.23: Death of Parents by Age

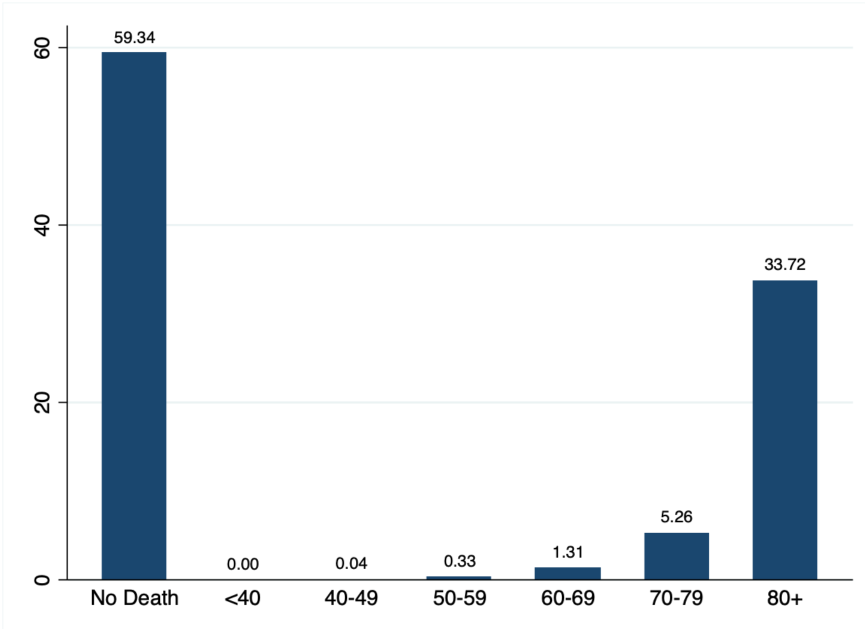


Figure A.23 plots the percentage of children observed with at least one parent's death by age of the parent. Statistics are weighted using the most recent individual sampling weights of the child.

Figure A.24: Age at Last Observed Health Status (Restricted Parent Sample)

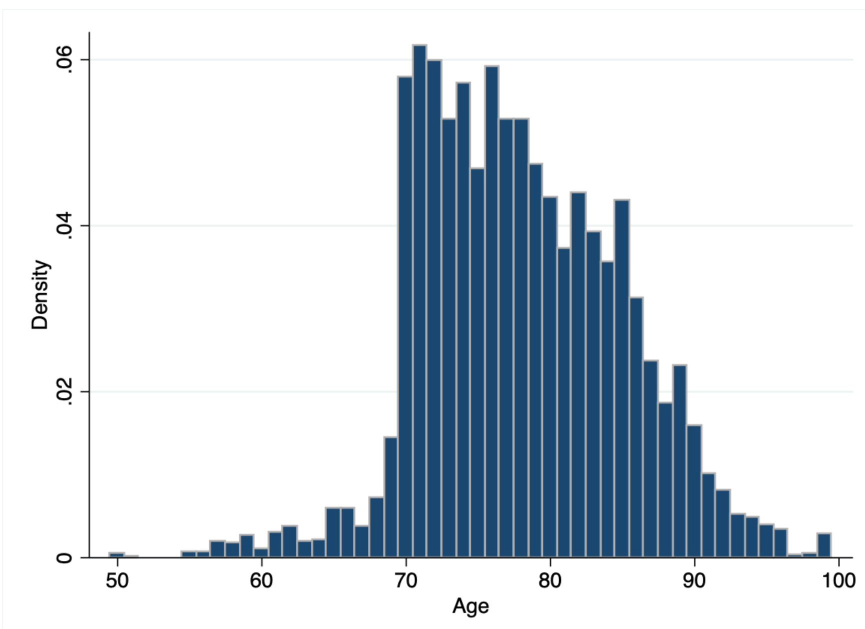


Figure A.24 plots the age with the last observed health status for parents with health observations measured at age 70 or later and parents who have died prior to age 70.

Appendix Tables

Table A.1: Probability of child in at least good health conditioned on both parents' health status

	All (1)	Sons (2)	Daughters (3)
Both Parents' Health Good, Very Good, Excellent	0.109	0.118	0.0989
	(0.0149)	(0.0220)	(0.0191)
Constant	0.613	0.567	0.691
	(0.218)	(0.301)	(0.307)
Observations	7,987	3,763	4,224
R-squared	0.048	0.047	0.056
Y-mean	0.870	0.884	0.855

Each column of Table A.1 reports the coefficients and standard errors from a weighted regression using sampling weights of the most recently available individual weights for the child. The dependent variable for all specifications is an indicator variable that takes on the value of 1 (and 0 otherwise) if the child's time-averaged continuous health measure is in good, very good or excellent health according to the HALex scale. The main explanatory variable is an indicator that takes on the value of 1 (and 0 otherwise) if both the mother's and father's time-averaged continuous health measure are in good, very good or excellent health according to the HALex scale. The omitted category for all regressions is at least one parent's health is in poor or fair health. All specifications include as controls the quadratic age terms of the mother, father and child. Age for both generations are defined as the time-averaged age of the individual at the time of all available health observations. If the individual is missing health observations from one of the parents, the quadratic age terms for that parent is replaced with a 0. Two indicator variables, one for mother and one for father, are included that take on the value of 1 (and 0 otherwise) if that parent is missing. Y-mean refers to the weighted mean of the dependent variable within the regression sample. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.

Table A.2: Intergenerational health associations based on non-linear latent variable model

	Bayesian Estimates	Linear Estimates
All Parents All Children	0.291	0.229
Mothers Daughters	0.285	0.206
Fathers - Sons	0.238	0.165

Table A.3: Descriptive statistics of self-reported health status and alternative health index (1999-2013 sample)

A. Parents

	Father (1)	Mother (2)
Age	64.63	64
	(10.29)	(10.94)
Years of Education	13.13	12.62
	(2.99)	(2.66)
Total Family Income (2013 Dollars)	62371.26	51490.32
	(60672.54)	(52306.30)
Post-1999 Self-Reported Health Status	73.5	71.47
	(20.66)	(20.28)
Alternative Health Index	0.87	0.86
	(0.12)	(0.13)
Number of Adverse Health Conditions	2.77	3.01
	(2.51)	(2.69)
Correlation between Self-Reported Health and Alternative Health Index	0.75	0.76
Years of Health Measurement (Min=1, Max=8)	6.3	6.6
Number of Observations	3,216	4,728

B. Children

	All (3)	Sons (4)	Daughters (5)
Age	41.25	41.45	41.05
	(8.55)	(8.73)	(8.36)
Years of Education	14.05	13.95	14.14
	(2.23)	(2.27)	(2.18)
Total Family Income (2013 Dollars)	60062.70	63615.77	56479.02
	(58431.95)	(58960.77)	(57683.93)

Table A.3: Descriptive statistics of self-reported health status and alternative health index (1999-2013 sample) – Continued

Post-1999 Self-Reported Health Status	81.63	82.50	80.76
	(14.84)	(14.93)	(14.70)
Alternative Health Index	0.94	0.94	0.93
	(0.08)	(0.07)	(0.08)
Number of Adverse Health Conditions	1.34	1.25	1.42
	(1.65)	(1.54)	(1.74)
Correlation between Self-Reported Health and Alternative Health Index	0.675	0.660	0.689
Race			
White	84%	86%	83%
Black	13%	11%	14%
Other	3%	3%	3%
Years of Health Measurement (Min=1, Max=8)	5.1	5.1	5.1
Number of Observations	5,162	2,415	2,747

Table A.3 provides summary statistics of the 1999-2013 survey data. This sample includes only individuals who are matched to at least one parent. Across both generation, only individuals with at least one alternative health index observation measured at age 30 and older are included. Panel A reports the summary statistics for the parent generation. Panel B reports the summary statistics for the child generation. Age refers to the mean time-averaged age of the individual at the time of all available health observations in 1999-2013. Years of education is the mean total years of education attained reported at most recently available survey. Total family income reported in 2013 dollars is the mean time-averaged available total family income from 1999-2013, which includes all taxable income and cash transfers for all family members after adjusting for family size and inflation. The Post-1999 Self-Reported Health Status is mean time-averaged continuous health measure analogous to baseline health measure using only data from survey years 1999-2013. The Alternative Health Index is the mean time-averaged fraction of 21 adverse health conditions that the individual does not have. Details on the Alternative Health Index is provided in Appendix B. Number of Adverse Health Conditions refers to the mean implied number of adverse conditions based on the alternative health index. Correlation between Self-Reported Health and Alternative Health Index is the correlation between the time-averaged continuous health measure using self-reported health status and the time-averaged fraction of 21 adverse health conditions that the individual does not have, weighted using the most recently available individual sampling weight. Years of health measurement refers to the mean number of total years of health observations for each individual. By construction, all individuals have same number of years of Post-1999 Self-Reported Health Status and Alternative Health measures. The race categories refer to the percentage of the sample that identifies with that race in most recently available survey. All reported means and standard errors are weighted using the most recently available individual sampling weight.

Table A.4: Robustness of health mobility estimates to varying parent and child age

		Mother's Health					Father's Health				
		Child's Age					Child's Age				
		30-39	40-49	50-59	60-69	**All Ages**	30-39	40-49	50-59	60-69	**All ages**
		(1)	(2)	(3)	(4)	**(5)**	(6)	(7)	(8)	(9)	**(10)**
A. Intergenerational Health Associations (All Children)											
Parent's Age	30-39	0.231***	0.164**			**0.222*** **	0.249***	0.297***			**0.249*** **
		(0.035)	(0.064)			**(0.035)**	(0.058)	(0.115)			**(0.057)**
		n=2523	n=588			**n=2531**	n=1586	n=262			**n=1588**
	40-49	0.194***	0.218***	0.244***		**0.202*** **	0.189***	0.195***	-0.027		**0.192*** **
		(0.024)	(0.039)	(0.067)		**(0.024)**	(0.032)	(0.049)	(0.082)		**(0.032)**
		n=4174	n=1641	n=507		**n=4207**	n=2644	n=905	n=172		**n=2652**
	50-59	0.150***	0.207***	0.267***	0.391***	**0.173*** **	0.123***	0.145***	0.125***	0.180**	**0.134*** **
		(0.017)	(0.030)	(0.036)	(0.075)	**(0.020)**	(0.016)	(0.023)	(0.035)	(0.078)	**(0.016)**
		n=5762	n=3128	n=1447	n=282	**n=5913**	n=3795	n=1900	n=797	n=120	**n=3846**
	60-69	0.135***	0.184***	0.253***	0.223***	**0.165*** **	0.120***	0.152***	0.200***	0.350***	**0.146*** **
		(0.016)	(0.025)	(0.032)	(0.049)	**(0.018)**	(0.015)	(0.022)	(0.033)	(0.061)	**(0.017)**
		n=4845	n=3495	n=1875	n=586	**n=5127**	n=3631	n=2397	n=1271	n=367	**n=3774**
	All ages	**0.171*** **	**0.213*** **	**0.264*** **	**0.255*** **	**0.204*** **	**0.145*** **	**0.168*** **	**0.190*** **	**0.388*** **	**0.172*** **
		(0.018)	**(0.026)**	**(0.029)**	**(0.051)**	**(0.019)**	**(0.016)**	**(0.021)**	**(0.030)**	**(0.066)**	**(0.017)**
		n=7208	**n=4193**	**n=2191**	**n=701**	**n=7606**	**n=5188**	**n=2890**	**n=1477**	**n=433**	**n=5376**

Table A.4: Robustness of health mobility estimates to varying parent and child age – Continued

		Mother's Health					Father's Health				
		B. Rank-Rank Slopes (Sons Only)									
		Child's Age					Child's Age				
		30-39 (11)	40-49 (12)	50-59 (13)	60-69 (14)	**All ages (15)**	30-39 (16)	40-49 (17)	50-59 (18)	60-69 (19)	**All ages (20)**
	30-39	0.222***	0.226***			**0.217*** **	0.200***	0.268**			**0.196*** **
		(0.042)	(0.081)			**(0.040)**	(0.054)	(0.114)			**(0.052)**
		n=1132	n=254			**n=1135**	n=721	n=114			**n=721**
	40-49	0.212***	0.236***	0.235**		**0.211*** **	0.189***	0.239***	0.018		**0.189*** **
		(0.033)	(0.049)	(0.097)		**(0.031)**	(0.039)	(0.063)	(0.122)		**(0.039)**
		n=1888	n=696	n=206		**n=1908**	n=1251	n=425	n=85		**n=1256**
	50-59	0.195***	0.243***	0.276***	0.359***	**0.210*** **	0.197***	0.201***	0.054	0.045	**0.192*** **
Parent's Age		(0.029)	(0.038)	(0.049)	(0.104)	**(0.028)**	(0.032)	(0.044)	(0.062)	(0.152)	**(0.032)**
		n=2703	n=1405	n=650	n=142	**n=2786**	n=1833	n=878	n=360	n=60	**n=1861**
	60-69	0.207***	0.242***	0.257***	0.288***	**0.242*** **	0.199***	0.230***	0.166***	0.347***	**0.214*** **
		(0.031)	(0.035)	(0.041)	(0.060)	**(0.031)**	(0.033)	(0.041)	(0.056)	(0.089)	**(0.033)**
		n=2327	n=1636	n=887	n=298	**n=2488**	n=1779	n=1133	n=613	n=190	**n=1858**
	All ages	**0.209*** **	**0.235*** **	**0.258*** **	**0.268*** **	0.243***	**0.195*** **	**0.219*** **	**0.123*** **	**0.300*** **	0.212***
		(0.025)	**(0.029)**	**(0.035)**	**(0.051)**	(0.025)	**(0.028)**	**(0.034)**	**(0.044)**	**(0.070)**	(0.028)
		n=3360	**n=1909**	**n=998**	**n=342**	n=3564	**n=2424**	**n=1322**	**n=689**	**n=214**	n=2520

Table A.4: Robustness of health mobility estimates to varying parent and child age – Continued

		C. Rank-Rank Slopes (Daughters Only)									
		Mother's Health					Father's Health				
		Child's Age					Child's Age				
		30-39	40-49	50-59	60-69	**All ages**	30-39	40-49	50-59	60-69	**All ages**
		(21)	(22)	(23)	(24)	**(25)**	(26)	(27)	(28)	(29)	**(30)**
	30-39	0.224***	0.140*			**0.207*****	0.201***	0.232**			**0.178*****
		(0.038)	(0.080)			**(0.037)**	(0.047)	(0.105)			**(0.046)**
		n=1354	n=326			**n=1359**	n=760	n=124			**n=762**
	40-49	0.282***	0.324***	0.342***		**0.284*****	0.223***	0.262***	0.012		**0.224*****
		(0.028)	(0.039)	(0.063)		**(0.027)**	(0.039)	(0.054)	(0.102)		**(0.036)**
		n=2266	n=937	n=301		**n=2279**	n=1323	n=459	n=86		**n=1326**
	50-59	0.258***	0.271***	0.287***	0.311***	**0.279*****	0.224***	0.226***	0.225***	0.305**	**0.232*****
Parent's Age		(0.026)	(0.033)	(0.045)	(0.093)	**(0.026)**	(0.032)	(0.042)	(0.058)	(0.140)	**(0.031)**
		n=3057	n=1722	n=797	n=140	**n=3125**	n=1934	n=1012	n=435	n=60	**n=1957**
	60-69	0.265***	0.264***	0.296***	0.234***	**0.290*****	0.231***	0.248***	0.248***	0.361***	**0.261*****
		(0.028)	(0.030)	(0.039)	(0.074)	**(0.027)**	(0.031)	(0.034)	(0.046)	(0.086)	**(0.030)**
		n=2509	n=1850	n=984	n=285	**n=2629**	n=1842	n=1256	n=656	n=176	**n=1905**
	All ages	**0.271*****	**0.269*****	**0.272*****	**0.248*****	0.287***	**0.229*****	**0.238*****	**0.237*****	**0.347*****	0.251***
		(0.023)	**(0.026)**	**(0.033)**	**(0.059)**	(0.022)	**(0.027)**	**(0.029)**	**(0.038)**	**(0.064)**	(0.025)
		n=3792	**n=2246**	**n=1161**	**n=339**	n=3960	**n=2606**	**n=1514**	**n=773**	**n=211**	n=2689

Table A.4 reports the intergenerational health association (Panel A) and rank-rank slopes (Panel B) using varying combinations of health measurements at different ages for parent and child. Each cell of Panel A reports the coefficient and standard error on parent's health measure, and number of observations from a weighted regression using the most recently available individual sampling weights for the child. Specifications in each row (column) uses parent's (child's) health measure constructed by averaging over all available health observations within the 10-year age bins. All ages refers to the baseline health measure, which averages over all available health observations at age 30 and older. Columns 1 to 5 use mother's health as the parent health measure. Columns 6 to 10 use father's health as the parent health measure. All specifications in Panel A include as controls the quadratic age terms of the parent (mother or father) and child. Age for both generations is defined as the time-averaged age of the individual at the time of utilized health observations. Panel B reports the rank-rank slopes using sons and Panel C reports the rank-rank slopes using daughters. Each cell of Panel B and C reports the coefficient and standard error on parent's health rank and number of observations from a weighted bivariate regression using the most recently available individual sampling weights for the child. Specifications in each row (column) uses parent's (child's) health percentile ranks constructed using the age-adjusted health measure that averages over all available health observations within the 10-year age bins. Percentile ranking and age adjustment are done separately for each age bin and gender within each generation. All ages refers to the baseline health percentile ranks, constructed using the age-adjusted health measure that averages over all available health observations at age 30 and older. Columns 11 to 15 and 21 to 25 use mother's health rank as the dependent variable. Columns 16 to 20 and 26 to 30 use father's health rank as the dependent variable. Estimates from regressions with 30 or fewer observations are not reported. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation. *10%, **5%, ***1% significance.

Table A.5: Correlation in health and income mobility by parent-child samples

	Mother-Son (1)	Father-Son (2)	Mother-Daughter (3)	Father-Daughter (4)
All	0.255	0.253	0.249	0.234
Race				
White	0.254	0.253	0.258	0.242
Black	0.251	0.188	0.181	0.159
Education				
Less than HS	0.28	0.149	0.207	0.147
HS Degree	0.217	0.214	0.263	0.214
College Degree	0.263	0.269	0.156	0.287

Each cell of Table A.5 reports the correlation in health and income mobility. Health (income) mobility is defined as the difference between child's health (income) percentile rank and parent's health (income) percentile rank. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately by gender within each generation. Income percentile ranks are constructed from time-averaged total family income after adjusting for family size and inflation. Education refers to the parent's education level. In the sample with mothers, it refers to the mother's highest level of education in the most recently available survey. In the samples with fathers, it refers to father's highest level of education in the most recently available survey. All percentile ranks are constructed for the full sample of mothers, fathers, sons and daughters, not by subpopulations within the race or education categories. All estimates are weighted using the most recently available individual sampling weight.

Table A.6: Health rank mobility by race, region, and education for all parent-child samples

	Mother-Son			Father-Son		
	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile
	(1)	(2)	(3)	(4)	(5)	(6)
Race						
White	0.229	46.112	57.574	0.202	48.234	58.318
	(0.028)	(1.133)	(1.018)	(0.031)	(1.271)	(1.095)
Black	0.082	39.274	43.359	0.093	40.683	45.325
	(0.066)	(1.696)	(3.602)	(0.107)	(2.442)	(5.736)
Test of Equality P-Value	0.04	0.001	0	0.329	0.006	0.026
Region						
Northeast	0.181	47.606	56.64	0.152	50.896	58.482
	(0.065)	(2.310)	(2.427)	(0.070)	(2.696)	(2.571)
North Central	0.236	44.61	56.434	0.233	46.617	58.251
	(0.043)	(1.706)	(1.621)	(0.045)	(1.845)	(1.721)
South	0.238	41.755	53.645	0.188	43.822	53.203
	(0.044)	(1.567)	(1.915)	(0.051)	(1.918)	(2.138)
West	0.201	47.136	57.164	0.155	50.857	58.601
	(0.066)	(2.926)	(2.196)	(0.076)	(3.531)	(2.353)
Test of Equality P-Value	0.861	0.129	0.587	0.711	0.107	0.216
Education						
Less than HS	0.272	40.332	53.93	0.12	41.288	47.274
	(0.064)	(1.662)	(3.398)	(0.069)	(1.696)	(3.614)
HS Degree	0.205	45.778	56.025	0.18	48.608	57.604
	(0.031)	(1.178)	(1.229)	(0.040)	(1.570)	(1.451)
College Degree	0.131	53.433	59.99	0.043	58.711	60.878
	(0.078)	(3.929)	(1.864)	(0.062)	(2.987)	(1.652)
Test of Equality P-Value	0.371	0.002	0.134	0.171	0	0.003

Table A.6: Health rank mobility by race, region, and education for all parent-child samples– Continued

	Mother-Daughter			Father-Daughter		
	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile
	(7)	(8)	(9)	(10)	(11)	(12)
Race						
White	0.244	47.141	59.364	0.226	49.476	60.79
	(0.027)	(1.070)	(0.951)	(0.028)	(1.146)	(1.038)
Black	0.19	35.902	45.42	0.257	37.964	50.795
	(0.051)	(1.206)	(2.810)	(0.065)	(1.615)	(3.678)
Test of Equality P-Value	0.349	0	0	0.67	0	0.009
Region						
Northeast	0.291	44.154	58.688	0.226	48.322	59.622
	(0.054)	(2.007)	(2.124)	(0.061)	(2.398)	(2.327)
North Central	0.218	46.813	57.693	0.238	49.765	61.648
	(0.041)	(1.722)	(1.484)	(0.044)	(1.871)	(1.550)
South	0.349	41.446	58.884	0.239	45.94	57.908
	(0.037)	(1.301)	(1.681)	(0.048)	(1.716)	(1.998)
West	0.307	43.303	58.675	0.294	44.816	59.495
	(0.051)	(2.159)	(1.880)	(0.055)	(2.519)	(2.131)
Test of Equality P-Value	0.126	0.098	0.951	0.822	0.319	0.511
Education						
Less than HS	0.264	37.377	50.555	0.243	42.276	54.405
	(0.054)	(1.259)	(2.968)	(0.056)	(1.545)	(2.976)
HS Degree	0.204	47.768	57.95	0.175	49.035	57.769
	(0.030)	(1.145)	(1.127)	(0.039)	(1.443)	(1.436)
College Degree	0.317	46.905	62.735	0.211	53.868	64.404
	(0.059)	(2.965)	(1.663)	(0.050)	(2.534)	(1.486)
Test of Equality P-Value	0.197	0	0.001	0.589	0	0.001

Each row of Table A.6 reports the rank-rank slope, expected ranks at the 25th and 75th health percentile and number of observations for each parent-child sample. Health percentile ranks are constructed from the age-adjusted health measure and are ranked separately by gender within each generation. All percentile ranks are constructed for the full sample of mothers, fathers, sons and daughters, not by subpopulations within the region, race or education categories. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. Race refers to the reported race of the child. Education refers to the parent's education level. In the sample with mothers, it refers to the mother's highest level of education in the most recently available survey. In the samples with fathers, it refers to father's highest level of education in the most recently available survey. All regressions are weighted using the most recently available sampling weight of the child. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation. P-values from F-tests on the equality of the rank-rank slopes, expected ranks at the 25th and 75th percentiles within each category are reported.

Table A.7: Income rank mobility by race, region, and education for all parent-child samples

	Mother-Son			Father-Son		
	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile
	(1)	(2)	(3)	(4)	(5)	(6)
Race						
White	0.4	42.086	62.087	0.39	44.407	63.928
	(0.028)	(1.123)	(0.993)	(0.032)	(1.230)	(1.142)
Black	0.425	31.471	52.698	0.278	37.681	51.585
	(0.070)	(1.694)	(3.856)	(0.127)	(3.009)	(5.836)
Test of Equality P-Value	0.745	0	0.018	0.392	0.039	0.038
Region						
Northeast	0.403	44.802	64.975	0.414	47.045	67.725
	(0.066)	(2.745)	(2.095)	(0.072)	(2.814)	(2.394)
North Central	0.45	39.7	62.178	0.395	44.999	64.727
	(0.045)	(1.569)	(1.840)	(0.050)	(1.775)	(2.002)
South	0.433	36.156	57.819	0.363	40.25	58.396
	(0.037)	(1.441)	(1.745)	(0.052)	(2.035)	(1.965)
West	0.453	37.936	60.604	0.358	43.691	61.586
	(0.061)	(2.247)	(2.335)	(0.070)	(2.706)	(2.619)
Test of Equality P-Value	0.937	0.035	0.06	0.916	0.182	0.015
Education						
Less than HS	0.409	34.676	55.113	0.353	37.948	55.611
	(0.059)	(1.379)	(3.266)	(0.070)	(1.629)	(3.968)
HS Degree	0.406	41.094	61.383	0.259	47.776	60.732
	(0.033)	(1.234)	(1.213)	(0.047)	(1.629)	(1.583)
College Degree	0.303	50.026	65.158	0.372	48.188	66.763
	(0.084)	(4.452)	(1.799)	(0.067)	(3.436)	(1.620)
Test of Equality P-Value	0.501	0	0.02	0.3	0	0.004

Table A.7: Income rank mobility by race, region, and education for all parent-child samples – Continued

	Mother-Daughter			Father-Daughter		
	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile	Rank-Rank Slope	Expected Rank at 25th Percentile	Expected Rank at 75th Percentile
	(7)	(8)	(9)	(10)	(11)	(12)
Race						
White	0.413	43.712	64.385	0.365	47.341	65.613
	(0.025)	(1.018)	(0.917)	(0.028)	(1.133)	(1.019)
Black	0.422	30.363	51.488	0.332	31.416	48.009
	(0.058)	(1.179)	(3.381)	(0.087)	(1.690)	(5.192)
Test of Equality P-Value	0.885	0	0	0.712	0	0.001
Region						
Northeast	0.5	44.564	69.556	0.339	53.188	70.147
	(0.047)	(2.005)	(1.702)	(0.053)	(2.343)	(1.843)
North Central	0.48	39.226	63.219	0.409	44.057	64.501
	(0.035)	(1.370)	(1.464)	(0.045)	(1.758)	(1.772)
South	0.495	37.059	61.829	0.473	40.62	64.292
	(0.037)	(1.300)	(1.722)	(0.041)	(1.534)	(1.770)
West	0.411	41.605	62.142	0.295	45.869	60.625
	(0.050)	(1.818)	(2.218)	(0.061)	(2.276)	(2.621)
Test of Equality P-Value	0.527	0.011	0.004	0.056	0	0.014
Education						
Less than HS	0.38	33.121	52.114	0.51	37.916	63.395
	(0.058)	(1.249)	(3.472)	(0.064)	(1.484)	(3.736)
HS Degree	0.396	43.266	63.042	0.248	47.903	60.285
	(0.029)	(1.115)	(1.108)	(0.040)	(1.351)	(1.553)
College Degree	0.382	48.711	67.805	0.27	56.653	70.168
	(0.055)	(2.847)	(1.511)	(0.053)	(2.852)	(1.327)
Test of Equality P-Value	0.957	0	0	0.002	0	0

Each row of Table A.7 reports the rank-rank slope, expected ranks at the 25th and 75th health percentile and number of observations for each parent-child sample. The corresponding regression for each row only uses observations in that category. Income percentile ranks are constructed from time-averaged total family income after adjusting for family size and inflation and are ranked separately by gender within each generation. Ranks are constructed from the full sample, not separately for each subpopulation. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. Race refers to the reported race of the child. Education refers to the parent's education level. In the sample with mothers, it refers to the mother's highest level of education in the most recently available survey. In the samples with fathers, it refers to father's highest level of education in the most recently available survey. See notes to Table **??** for additional details on rank-rank specifications. All regressions are weighted using the most recently available sampling weight of the child. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation. P-values from F-tests on the equality of the rank-rank slopes, expected ranks at the 25th and 75th percentiles within each category are reported.

Table A.8: Upward and downward health mobility by race, region, and education

	Mother-Son				Father-Son			
	Escape Bottom Quintile	Bottom to Top Quintile	Escape Top Quintile	Top to Bottom Quintile	Escape Bottom Quintile	Bottom to Top Quintile	Escape Top Quintile	Top to Bottom Quintile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overall	65.8%	11.4%	70.3%	10.4%	68.0%	12.1%	70.3%	8.8%
Race								
White	67.7%	11.7%	69.2%	9.5%	69.6%	13.0%	70.5%	8.0%
Black	62.0%	11.5%	88.3%	23.5%	60.2%	8.3%	57.9%	10.1%
Region								
Northeast	76.1%	10.5%	67.1%	12.0%	73.3%	16.6%	68.8%	6.1%
North Central	62.9%	13.7%	74.7%	9.5%	71.5%	14.5%	68.3%	7.3%
South	62.6%	9.5%	75.1%	11.1%	63.6%	7.6%	78.5%	11.2%
West	68.8%	19.9%	76.6%	13.5%	73.1%	20.9%	69.6%	11.2%
Education								
Less than HS	62.5%	7.1%	61.2%	16.5%	64.6%	10.2%	77.9%	19.3%
HS Degree	67.8%	12.4%	75.4%	10.6%	71.3%	12.3%	75.0%	8.7%
College Degree	73.1%	34.4%	63.0%	8.9%	84.9%	28.9%	66.0%	8.0%

Table A.8: Upward and downward health mobility by race, region, and education – Continued

	Mother-Daughter				Father-Daughter			
	Escape Bottom Quintile	Bottom to Top Quintile	Escape Top Quintile	Top to Bottom Quintile	Escape Bottom Quintile	Bottom to Top Quintile	Escape Top Quintile	Top to Bottom Quintile
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Overall	64.4%	10.7%	69.0%	8.7%	72.1%	14.8%	67.4%	8.0%
Race								
White	70.2%	13.5%	68.3%	8.3%	75.5%	17.9%	66.9%	7.3%
Black	54.0%	6.3%	82.9%	22.3%	61.3%	5.6%	90.2%	15.1%
Region								
Northeast	60.9%	10.5%	63.6%	7.5%	75.0%	17.5%	66.3%	11.4%
North Central	71.5%	12.7%	73.0%	9.9%	73.4%	17.9%	68.2%	4.0%
South	59.1%	7.0%	69.5%	3.0%	69.8%	12.6%	74.8%	8.8%
West	63.8%	10.9%	75.0%	12.4%	72.2%	5.7%	67.1%	8.9%
Education								
Less than HS	53.5%	5.7%	74.0%	16.1%	62.3%	9.6%	88.2%	21.0%
HS Degree	73.5%	14.2%	69.9%	9.4%	80.2%	17.8%	74.3%	9.6%
College Degree	72.9%	18.3%	66.3%	5.9%	92.1%	29.2%	56.0%	3.7%

Each row of Table A.8 reports the percentage of the specified subsample that escapes the bottom health quintile, moves from bottom to top health quintile, escapes the top health quintile and moves from top to bottom health quintile. Escape Bottom (Top) Quintile refers to the percentage of the specified subsample with parent in the bottom (top) parent health quintile who is not in the bottom (top) health quintile of the child health distribution. Bottom (top) to Top (bottom) refers to the percentage of the specified subsample with parent in the bottom (top) parent health quintile who is in the top (bottom) quintile of the child health distribution. Health quintiles are constructed from the age-adjusted baseline health measure and are created separately by gender within each generation. All quintile ranks are constructed for the full sample of mothers, fathers, sons and daughters, not by subpopulations within the region, race or education categories. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. Race refers to the reported race of the child. Education refers to the parent's education level. In the sample with mothers, it refers to the mother's highest level of education in the most recently available survey. In the samples with fathers, it refers to father's highest level of education in the most recently available survey. All estimates are weighted using the most recently available sampling weights of the child.

Table A.9: Upward and downward income mobility by race, region, and education

	Mother-Son				Father-Son			
	Escape Bottom Quintile	Bottom to Top Quintile	Escape Top Quintile	Top to Bottom Quintile	Escape Bottom Quintile	Bottom to Top Quintile	Escape Top Quintile	Top to Bottom Quintile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overall	54.7%	5.3%	55.0%	6.1%	64.9%	7.4%	56.1%	6.5%
Race								
White	58.5%	6.7%	56.1%	6.2%	65.2%	7.5%	56.9%	6.2%
Black	46.9%	3.0%	74.6%	13.7%	62.5%	8.7%	81.6%	48.3%
Region								
Northeast	69.4%	18.2%	46.5%	4.1%	76.4%	12.6%	44.7%	5.8%
North Central	54.4%	4.5%	51.7%	6.7%	66.0%	5.9%	56.7%	3.4%
South	52.8%	2.6%	69.2%	6.6%	60.0%	7.9%	67.9%	8.3%
West	42.4%	0.1%	57.7%	8.0%	69.6%	4.0%	61.2%	9.9%
Education								
Less than HS	49.6%	3.1%	63.2%	11.8%	57.6%	5.5%	54.5%	13.5%
HS Degree	58.1%	6.2%	57.9%	4.7%	76.3%	11.1%	69.0%	3.8%
College Degree	86.9%	35.6%	51.1%	6.9%	87.5%	0.0%	51.5%	7.1%

Table A.9: Upward and downward income mobility by race, region, and education – Continued

	Mother-Daughter				Father-Daughter			
	Escape Bottom Quintile (9)	Bottom to Top Quintile (10)	Escape Top Quintile (11)	Top to Bottom Quintile (12)	Escape Bottom Quintile (13)	Bottom to Top Quintile (14)	Escape Top Quintile (15)	Top to Bottom Quintile (16)
Overall	55.4%	4.8%	56.2%	4.3%	66.0%	6.7%	56.5%	5.1%
Race								
White	64.3%	6.1%	55.4%	3.9%	70.8%	8.8%	56.9%	5.2%
Black	42.3%	3.4%	73.6%	22.0%	51.4%	1.7%	99.6%	4.0%
Region								
Northeast	54.2%	6.7%	52.5%	3.1%	90.0%	13.2%	49.5%	3.6%
North Central	56.2%	2.1%	54.3%	3.3%	64.6%	6.5%	60.4%	5.9%
South	50.0%	5.6%	67.0%	6.1%	52.8%	5.2%	61.6%	4.1%
West	67.1%	6.1%	49.1%	3.6%	77.8%	8.3%	57.9%	8.2%
Education								
Less than HS	48.3%	3.0%	86.2%	3.9%	55.4%	3.7%	67.9%	3.5%
HS Degree	63.4%	7.7%	59.5%	3.3%	76.9%	8.4%	67.8%	6.9%
College Degree	80.0%	0.0%	49.6%	5.9%	90.7%	28.0%	50.1%	4.2%

Each row of Table A.9 reports the percentage of the specified subsample that escapes the bottom income quintile, moves from bottom to top income quintile, escapes the top income quintile and moves from top to bottom income quintile. Escape Bottom (Top) Quintile refers to the percentage of the specified subsample with parent in the bottom (top) parent income quintile who is not in the bottom (top) income quintile of the child income distribution. Bottom (top) to Top (bottom) refers to the percentage of the specified subsample with parent in the bottom (top) parent income quintile who is in the top (bottom) quintile of the child income distribution. Income quintiles are constructed from the age-adjusted baseline income measure and are created separately by gender within each generation. All quintile ranks are constructed for the full sample of mothers, fathers, sons and daughters, not by subpopulations within the region, race or education categories. Region refers to the region the child grew up in, defined as the modal region in which the household is surveyed before the child is 18. Race refers to the reported race of the child. Education refers to the parent's education level. In the sample with mothers, it refers to the mother's highest level of education in the most recently available survey. In the samples with fathers, it refers to father's highest level of education in the most recently available survey. All estimates are weighted using the most recently available sampling weights for the child.

Table A.10: Robustness of intergenerational health associations by birth cohort using both parents' health

	1950-1959	1960-1969	1970-1979	Test: 1950-1969 vs. 1970-1979 Slope
	(1)	(2)	(3)	(4)
All Children				
At least 30	0.230***	0.173***	0.287***	0.079*
	(0.031)	(0.031)	(0.038)	(0.042)
30-40 Child, 40-70 Parent	0.177***	0.159***	0.259***	0.083**
	(0.036)	(0.030)	(0.036)	(0.041)
30-40 Child, 50-70 Parent	0.180***	0.146***	0.196***	0.028
	(0.036)	(0.027)	(0.030)	(0.036)
Sons				
At least 30	0.234***	0.122***	0.282***	0.107*
	(0.038)	(0.038)	(0.052)	(0.056)
30-40 Child, 40-70 Parent	0.175***	0.095***	0.243***	0.102*
	(0.042)	(0.036)	(0.049)	(0.054)
30-40 Child, 50-70 Parent	0.179***	0.084**	0.197***	0.059
	(0.042)	(0.033)	(0.040)	(0.046)
Daughters				
At least 30	0.238***	0.232***	0.288***	0.048
	(0.039)	(0.047)	(0.045)	(0.052)
30-40 Child, 40-70 Parent	0.190***	0.242***	0.273***	0.061
	(0.045)	(0.044)	(0.041)	(0.049)
30-40 Child, 50-70 Parent	0.188***	0.219***	0.196***	-0.002
	(0.045)	(0.041)	(0.036)	(0.046)

Table A.10 reports the intergenerational health association by child's birth cohort (1950-1959, 1960-1969, 1970-1979) for each sample. At least 30 refers to using all available health measurements at least 30 years old for both parent and child generations. 30-40 Child, 40-70 (50-70) Parent refers to using all available health measurements that are between age 30 and 40, inclusive, for the child's health measure and all available health measurements that are between age 40 (50) and 70 for the parent's health measure. The dependent variable for all specifications is the child's time-averaged continuous health measure. The parent health measure is the average of the mother's and father's health if available. Otherwise, only one parent's health measure is used. All specifications include as controls the quadratic age terms of the mother, father and child, and missing indicators for mother and father. Age for both generations is defined as the time-averaged age of the individual at the time of health observations. In Columns 1 to 3, each cell reports coefficient and standard error on the both parent health measure from a weighted regression using sampling weights of the most recently available individual weights for the child. Column 4 reports the estimate and standard error of the difference in the coefficient on parent health measure for birth cohort 1970-1979 and the coefficient on parent health measure for the pooled birth cohorts 1950-1969. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation. *10%, **5%, ***1% significance.

Table A.11: Robustness of rank mobility estimates by birth cohort and parent-child subsamples

	1950-1959		1960-1969		1970-1979			
	Rank-Rank Slope	Exp. Rank at 25th Percentile	Rank-Rank Slope	Exp. Rank at 25th Percentile	Rank-Rank Slope	Exp. Rank at 25th Percentile	Test: 1950-1969 vs. 1970-1979 Slope	Test: 1950-1969 vs. 1970-1979 Exp. Rank at the 25th Percentile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother-Son								
At least 30	0.258***	45.3***	0.171***	46.3***	0.248***	44.1***	0.035	-1.7
	(0.045)	(1.6)	(0.050)	(1.8)	(0.044)	(1.9)	(0.055)	(2.195)
30-40 Child, 40-70 Parent	0.244***	45.1***	0.148***	46.8***	0.247***	43.8***	0.053	-2.111
	(0.047)	(1.7)	(0.051)	(1.8)	(0.043)	(1.8)	(0.055)	(2.196)
30-40 Child, 50-70 Parent	0.251***	44.8***	0.125**	47.0***	0.230***	43.8***	0.042	-2.075
	(0.047)	(1.7)	(0.053)	(1.8)	(0.045)	(1.9)	(0.057)	(2.254)
Mother-Daughter								
At least 30	0.260***	44.9***	0.291***	44.1***	0.276***	43.4***	0	-1.032
	(0.042)	(1.7)	(0.044)	(1.6)	(0.042)	(1.5)	(0.052)	(1.937)
30-40 Child, 40-70 Parent	0.230***	45.5***	0.317***	43.2***	0.282***	43.0***	0.004	-1.273
	(0.045)	(1.8)	(0.042)	(1.6)	(0.042)	(1.5)	(0.052)	(1.903)
30-40 Child, 50-70 Parent	0.241***	45.6***	0.305***	43.4***	0.284***	43.3***	0.008	-1.122
	(0.046)	(1.8)	(0.044)	(1.6)	(0.045)	(1.6)	(0.055)	(1.974)
Father-Son								
At least 30	0.149***	49.4***	0.166***	48.4***	0.287***	44.1***	0.128**	-4.755*
	(0.055)	(2.1)	(0.054)	(2.1)	(0.046)	(2.0)	(0.059)	(2.450)
30-40 Child, 40-70 Parent	0.187***	48.0***	0.166***	48.2***	0.253***	44.6***	0.078	-3.477
	(0.056)	(2.1)	(0.054)	(2.0)	(0.048)	(1.9)	(0.061)	(2.420)
30-40 Child, 50-70 Parent	0.190***	47.9***	0.184***	48.2***	0.294***	44.2***	0.108*	-3.858
	(0.056)	(2.1)	(0.054)	(2.1)	(0.047)	(2.0)	(0.061)	(2.485)
Father-Daughter								
At least 30	0.258***	48.5***	0.196***	47.6***	0.236***	46.2***	0.011	-1.731
	(0.046)	(1.9)	(0.050)	(2.0)	(0.048)	(1.9)	(0.059)	(2.309)
30-40 Child, 40-70 Parent	0.278***	48.8***	0.220***	47.5***	0.202***	47.1***	-0.041	-0.971
	(0.047)	(1.9)	(0.053)	(2.0)	(0.051)	(1.9)	(0.061)	(2.320)
30-40 Child, 50-70 Parent	0.279***	48.8***	0.236***	47.3***	0.208***	47.7***	-0.046	-0.268
	(0.047)	(1.9)	(0.055)	(2.1)	(0.055)	(2.0)	(0.066)	(2.401)
Both Parents-All Children								
At least 30	0.257***	44.7***	0.203***	45.8***	0.278***	43.6***	0.049	-1.633
	(0.033)	(1.3)	(0.034)	(1.2)	(0.030)	(1.2)	(0.038)	(1.491)
30-40 Child, 40-70 Parent	0.230***	45.3***	0.206***	45.8***	0.269***	43.7***	0.052	-1.924
	(0.035)	(1.3)	(0.033)	(1.2)	(0.030)	(1.2)	(0.039)	(1.476)
30-40 Child, 50-70 Parent	0.240***	45.2***	0.214***	45.5***	0.250***	44.0***	0.023	-1.383
	(0.034)	(1.3)	(0.034)	(1.2)	(0.031)	(1.2)	(0.040)	(1.517)

Table A.11 reports the rank-rank slope and expected rank at the 25th health percentile by child's birth cohort (1950-1959, 1960-1969, 1970-1979) for each sample. At least 30 refers to using all available health measurements at least 30 years old for both parent and child generations. 30-40 Child, 40-70 (50-70) Parent refers to using all available health measurements that are between age 30 and 40, inclusive, for the child's health measure and all available health measurements that are between age 40 (50) and 70 for the parent's health measure. Column 4 reports the estimate and standard error of the difference in the rank-rank slope for birth cohort 1970-1979 and the coefficient on parent health measure for the pooled birth cohorts 1950-1969. Column 5 reports the estimate and standard error of the difference in the expected rank at the 25th health percentile for birth cohort 1970-1979 and that for the pooled cohort 1950-1969. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation. *10%, **5%, ***1% significance.

Table A.12: Heath rank mobility by childhood insurance coverage

	Rank-Rank Slope (1)	Expected Rank at 25th Percentile (2)	Expected Rank at 75th Percentile (3)	Observations (4)
Overall	0.243	45.133	57.269	4584
	(0.024)	(0.853)	(0.985)	
Overall - Adjusted for Family Background	0.155	46.939	54.679	4584
	(0.024)	(0.912)	(0.972)	
Insurance				
Some Coverage	0.212	46.802	57.408	3797
	(0.026)	(0.916)	(1.019)	
No Coverage	0.347	34.325	51.657	787
	(0.063)	(2.100)	(3.526)	
Difference	-0.135	12.477	5.751	4584
	(0.068)	(2.295)	(3.659)	
Insurance - Adjusted for Family Background				
Some Coverage	0.128	48.738	55.157	3797
	(0.026)	(0.965)	(1.011)	
No Coverage	0.256	33.062	45.849	787
	(0.061)	(2.274)	(3.154)	
Difference	-0.127	15.676	9.308	4584
	(0.066)	(2.469)	(3.300)	

Each row of Table A.12 reports the rank-rank slope, expected ranks at the 25th and 75th health percentile and number of observations for the sample of children who were between age 0 and 16 in the 1968-1972 PSID surveys. The parent health rank is constructed from the age-adjusted both parents health measure. The child health rank is constructed from the pooled age-adjusted child health measure for sons and daughters. Adjusting for family background means that the both parents health measure is adjusted for family income and years of education of the mother and father, in addition to age. Insurance coverage refers to a child living in a household in 1968-1972 in which all family members are covered. Some coverage refers to coverage for at least one year during that time period. All regressions are weighted using the most recently available sampling weight of the child. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation. Differences (and the corresponding standard errors) in rank-rank slopes, expected ranks at the 25th and 75th percentiles between the sample with some and without insurance coverage are also reported.

Table A.13: Heath mobility restricted to parents observed until age 70

	(1) Child Health	(2) Child Health Rank	(3) Child Health	(4) Child Health Rank
Parent Health	0.220			
	(0.024)			
Parent Health Rank		0.276		
		(0.025)		
Parent Health (Imputed)			0.219	
			(0.024)	
Parent Health Rank (Imputed)				0.240
				(0.026)
Observations	3602	3628	3602	3641
R^2	0.119	0.078	0.120	0.060

The sample is restricted to children whose parents have reported at least one health measure after the age 70 or has died prior to age 70. Imputed health measures replace observations after death as 0. Health measurements for children are those after the age of 30, as in the baseline specifications. All regressions are weighted using the most recently available sampling weight of the child. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.

Table A.14: Probability of Observing Parent's Health Measurement by Parent's Age

	Mother's Health			Father's Health		
	(1) Age 30-49	(2) Age 50-69	(3) Age 70+	(4) Age 30-49	(5) Age 50-69	(6) Age 70+
Parents' Education						
HS Degree	0.303	-0.067	-0.156	0.303	0.063	-0.085
	(0.011)	(0.010)	(0.011)	(0.011)	(0.012)	(0.010)
College Degree	0.373	0.003	-0.178	0.467	0.240	-0.059
	(0.014)	(0.013)	(0.014)	(0.015)	(0.015)	(0.013)
Race						
Black	0.054	-0.057	-0.069	-0.176	-0.287	-0.118
	(0.010)	(0.009)	(0.010)	(0.011)	(0.011)	(0.009)
Other	0.198	-0.217	-0.182	0.103	-0.077	-0.135
	(0.025)	(0.023)	(0.024)	(0.026)	(0.026)	(0.022)
Region						
North Central	0.069	-0.050	-0.044	0.082	-0.015	-0.030
	(0.015)	(0.013)	(0.014)	(0.015)	(0.015)	(0.013)
South	0.100	-0.070	-0.117	0.128	0.028	-0.063
	(0.014)	(0.013)	(0.013)	(0.015)	(0.015)	(0.013)
West	0.053	-0.055	-0.079	0.057	-0.046	-0.070
	(0.017)	(0.015)	(0.016)	(0.017)	(0.017)	(0.015)
Constant	0.328	0.909	0.478	0.165	0.607	0.361
	(0.016)	(0.014)	(0.015)	(0.016)	(0.016)	(0.014)
Observations	10041	10041	10041	10041	10041	10041
R^2	0.084	0.024	0.038	0.153	0.124	0.031

All regressions are unweighted. Parents' education refers to the highest education attained by at least one of the parents. The omitted groups are less than high school education for parents' education, whites for race, and Northeast for region. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.

Table A.15: Robustness to Sampling Weights

(a) Intergenerational Health Associations

	(1) No Weights	(2) First Round	(3) Last Round	(4) Average
Intergenerational Health Association	0.208	0.208	0.229	0.227
	(0.011)	(0.074)	(0.020)	(0.021)
Observations	8115	7987	7987	7987
R^2	0.124	0.189	0.124	0.126

(b) Rank-Rank Slope Estimates

	(1) No Weights	(2) First Round	(3) Last Round	(4) Average
Rank-Rank Slope	0.266	0.172	0.261	0.244
	(0.012)	(0.061)	(0.017)	(0.017)
Observations	8115	7937	7937	7937
R^2	0.077	0.041	0.075	0.068

Table A.15 shows our main results for IHA and rank-rank slopes using different weights. The first column shows the results without any weights. The second column shows results using the weights from the first interview round. The third column shows results using the weights from the last interview round, which is what we use in the main results. The fifth column shows the results using the average weight across all survey rounds. Standard errors for the regressions (in parentheses) are robust to heteroskedasticity and within-family correlation.