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# Intergenerational Health Mobility in the US

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Abstract: Studies of intergenerational mobility have largely ignored health despite the central importance of health to welfare. We present the first estimates of intergenerational health mobility in the US by using repeated measures of self-reported health status (SRH) during adulthood from the PSID. Our main finding is that there is substantially greater health mobility than income mobility in the US. A possible explanation is that social institutions and policies are more effective at disrupting intergenerational health transmission than income transmission. We further show that health and income each capture a distinct dimension of social mobility. We also characterize heterogeneity in health mobility by child gender, parent gender, race, education, geography and health insurance coverage in childhood. We find some important differences in the patterns of health mobility compared with income mobility and also find some evidence that there has been a notable decline in health mobility for more recent cohorts. We use a rich set of background characteristics to highlight potential mechanisms leading to intergenerational health persistence.

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## 1. Introduction

A large and growing multi-disciplinary literature on intergenerational mobility has emerged in recent decades. Its primary motivation has been concerns over equality of opportunity. Most of the studies in this literature have focused on income, education or occupation. However, one key component of socioeconomic status has largely been neglected, health.[1] This is unfortunate since health is an especially important component of welfare (Jones and Klenow, 2016). For one thing, longevity, which depends in large part on health, is clearly a powerful barometer of lifetime utility. Health also plays an important role throughout the life course by influencing a wide range of behaviors. For example, a large literature has 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, Fertig, and Paxson, 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 health mobility, however, is a formidable task. First, it requires panel data containing health measures for adults in two generations which is difficult to obtain. Second, since the concept of interest is one that is *latent*, health is inherently difficult to measure. Morbidity measurements are typically blunt proxies for a more fundamental underlying latent variable. Third, lifecycle issues may be an especially important concern in measuring health as one's long-run latent health status may not be revealed until relatively later in life when chronic diseases begin to emerge and impair functional abilities.

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 form new households and has

[1] A few studies have examined intergenerational associations in health outcomes such as birth weight (e.g. Currie and Morretti, 2007; Black et al. 2007), longevity (Lach, Ritov, and Simhon, 2008; Hong and Park, 2016), and asthma (Thompson, 2016). We are only aware of two papers that examine the relationship between parent and child's adult self-reported health status. Kim et al. (2015) uses 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 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.

been widely used to study intergenerational income mobility (e.g. Solon, 1992, Hertz, 2007, Mazumder, 2016). 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). This has also been demonstrated specifically in the PSID using its proprietary mortality files, where SRHS 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 dataset.

Using the PSID, we construct an intergenerational sample of parents and their adult children. We use all available years of information on health status for individuals who are at least 30 years old. We employ a method used by National Center for Health Statistics to convert SRHS to a continuous measure that is akin to a quality adjusted life year (see Erickson et al. 1995).[2] Following the income mobility literature, we then use time averages of this continuous measure 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 for each of two generations, enables us to overcome the key obstacles to studying intergenerational health mobility.

Our first measure of health mobility is what we call the Intergenerational Health Association (IHA). The IHA is the coefficient on parent health status from a regression of child health on parent health (adjusting for age). This provides a simple measure of the persistence in health status that is analogous to the intergenerational income elasticity. Our other measures of health mobility are rank-based. Adjusting for age, we use our time averaged measures of parent and child health to create percentiles in the health distribution for each generation. One particularly useful set of mobility measures is based on intergenerational "rank-rank" regressions as popularized by Chetty et al (2014). We estimate the slope of

[2] We follow the methodology employed by Johnson and Schoeni (2011) in their paper. Additional details provided in Section II.

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.

Our estimate of the IHA ranges from 0.20 to 0.25 depending on the parent-child gender combination. This suggests that there is only a moderate degree of intergenerational persistence in health status in the US. This is especially the case when compared to intergenerational persistence in family income which is typically estimated to be in the order of 0.5 or higher.[3] Notably, the few available estimates of intergenerational associations in longevity are also around 0.2.[4] Our estimates of the rank-rank slope (which is mathematically equivalent to the Spearman correlation coefficient) ranges from 0.21 to 0.29 and are also significantly lower than the estimates of 0.39 to 0.47 that we obtain when we use income ranks. In addition, we find that those starting at the 25th percentile experience greater upward mobility in ranks in health compared to income. We also find greater *downward* mobility in health rank than income rank when we focus on families starting at the 75th percentile. Overall, there appears to be greater health mobility than income mobility in the US.

We next consider how our estimates are affected by various measurement issues. First, although SRHS has been validated and is widely used, it is nonetheless a subjective measure. To address this concern, we combine a set of 21 objective health measures 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 of intergenerational health persistence using SRHS to those using the AHI. Remarkably, we find that the results using the two methods are extremely similar, further confirming that SRHS appears to be a valid measure of intergenerational health mobility.[5] We also show that, as is the case with income, estimates of intergenerational persistence in health rise as we use more years of parent health. Finally, we show that

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[3] See Mazumder (2016) for a brief discussion of papers estimating the intergenerational elasticity in family income. In our main sample which is not specifically designed to optimally estimate income mobility, the intergenerational elasticity in family income is estimated to be 0.39.

[4] See the papers cited in footnote 1.

[5] In a companion paper (in progress), we show that we obtain modestly higher estimates of intergenerational persistence when using a more sophisticated Bayesian model of latent health.

persistence estimates are higher when we measure parent and child health when both are at least age 50. This is consistent with the notion that latent health status might not be well captured until later in the life cycle when the variation in self-reported health status rises and there is more "signal" in the data.

We also explore the degree to which the same individuals that experience health mobility also experience income mobility. We do this by estimating the correlation in cross-generation changes in rank in health and income across families. We find that the correlation in rank mobility is around 0.25 suggesting that income and health largely capture distinct dimensions of socioeconomic status. In other words, households who experience improvements in health across generations do not necessarily experience concomitant improvements in income.[6]

We then characterize the variation in health mobility by region, race and parent education level using rank-rank regressions. We find that those who grew up in the South experience both lower upward mobility and higher downward mobility. Blacks also have substantially lower upward mobility and higher downward mobility in health but these racial gaps are significantly smaller than the comparable gaps in income mobility.[7] Finally, we show that the gaps in health mobility as measured by the expected ranks at the 25$^{th}$ and 75$^{th}$ percentiles, 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. That is, not only is your own health worse if you have less education, but your child's expected health rank as an adult will be worse as well.

We also find suggestive evidence of a decline in health mobility for cohorts born since 1970.[8] Since the cohorts born since 1970 are still relatively young, future work may be able to better substantiate this change in mobility. We also show that there is greater persistence in health status among families where

[6] This is potentially consistent with emerging biomedical research suggesting that socioeconomic success for low SES individuals may come at the expense of health (Miller et al, 2015).
[7] Studies of racial gaps in income mobility include: Hertz (2005); Bhattacharya and Mazumder (2011) and Mazumder (2014).
[8] Several studies have also found a decline in intergenerational income and educational mobility in recent decades (e.g. Aaronson and Mazumder, 2008; Davis and Mazumder, 2017; Hilger, 2017).

parents did not have health insurance suggesting an important potential role for policy. Finally, we examine the role of early life factors using data from the PSID's 2013 Childhood Retrospective Circumstance Study (CRCS). We find that close to 40 percent of intergenerational health persistence is explained by early life circumstances.

What explains our main finding of relatively high levels of intergenerational health mobility in the US? We hypothesize that this is likely due in part, to a combination of factors that reduce the transmission of health status across generations including: modern public health infrastructure (e.g. clean air and water), the availability of high quality medical care for most of the population, and a variety of social safety net programs (e.g. SNAP, WIC, Medicaid). In contrast, it may well be that opportunities for labor market success, which are rooted in educational opportunities earlier in life, may be much more unequal and hence, lead to greater intergenerational income persistence. It may also be the case that in the past, the rates of income persistence and health persistence were more similar, but in recent decades, as the labor market returns to schooling has risen and as income inequality has increased, intergenerational income persistence has also increased (Aaronson and Mazumder, 2008; Davis and Mazumder, 2017).

## 2. 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 topics 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 different waves of the survey.

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?"[9] 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 is 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.[10] We collect all values of SRHS between 1984 and 2013 for each person and, following Johnson and Schoeni (2011), convert the categorical values into a continuous measure using health utility-based scale developed for the Health and Activity Limitation Index (HALex) which is designed to estimate healthy life years.[11] The value ranges for each health status category are as follows: [95,100] is excellent; [85,95) is very good; [70,85) is good; [30,70) is fair; and [1,30) is poor. The values of the scale correspond to the percentage of a year that is considered to be of "quality" health for that individual. 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.

In Figure 1, panel A we plot the mean health status over the life cycle pooling all individuals in both generations. By this measure, health is roughly flat from age 30 to 40 but then begins to decline roughly linearly through age 80. After age 80 the samples are small and the estimates become noisy. To address this lifecycle pattern and in order to compare individuals at different ages we also construct a regression adjusted

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[9] 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.
[10] In our sample, 62% are matched to both parents, 33% to the mother only and 5% to the father only.
[11] 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, Wilson, and Shannon (1995).

measure of health status.[12] In panel B, we show the standard deviation in health status at each age. This highlights the point that there is considerably more variation in health as an individual ages. This is consistent with the onset of chronic diseases at later ages and suggests that health status may convey much more information about 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.

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.[13] 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 focus on a subsample of 3,281 adults in the 2013 PSID wave who were also part of the Childhood Retrospective Circumstance Study (CRCS). The CRCS was introduced in 2013 to collect data from over 8,000 household heads and spouses on their experiences in childhood and young adulthood. Topics include parental relationship quality, childhood health conditions, socioeconomic status, neighborhood quality, friendships, school experiences, relationship quality with parents/guardians and young adult mentoring. We created indices for most of these categories by taking the largest component from a principal components analysis (PCA).[14]

[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.
[13] We deflated using the CPI-U.
[14] 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.

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 53 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.[15] We break down the CRCS childhood experience variables into the following categories: family socioeconomic background, childhood health, childhood stability, school experience and childhood relationship. For family socioeconomic background, we constructed indices separately for each stage of childhood: age 0-5, age 6-12 and age 13-16. We also include an index that describes neighborhood quality. The socioeconomic status indices capture information about parents' employment status, financial struggles and welfare status during childhood. For neighborhood quality, the constructed index captures information such as safety at night and cleanliness of the neighborhood in which the child grew up during ages 6-12. For childhood health, we constructed an index that includes both SRHS and chronic conditions during childhood (e.g. asthma, diabetes). We also use indicators for being underweight, overweight, or obese, derived from BMI at age 13. Sons are more likely to be overweight or obese than daughters but daughters have worse childhood health. For childhood stability, we use two continuous measures that describe how many times the child moved and how many schools the child attended before age 17. We also use two indicator variables that capture home stability: if parents were satisfied with their relationship; and if parents ever divorced.

School experience is measured using the number of times a grade was repeated as well as an index (measured at ages 6-12 and 13-16) that captures being happy at school and being bullied at school. Boys are more likely to repeat school grades and have worse school experience than girls. We capture childhood

[15] 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.

relationship quality with indices for relationships with friends (measured at ages 6-12 and 13-16) and for relationships with mothers and fathers.[16] Finally, we include a dummy variable that indicates if the individual had a non-relative mentor during the ages 17-30.

## 3. Methodology

*Intergenerational Health Association (IHA)*

In the income mobility literature, a large number of studies have focused on 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:

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

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. $\boldsymbol{X}$ is a vector of controls and includes the quadratic age terms for both the parent(s) and the child. The parameter $\beta$ provides a measure of intergenerational persistence and 1 - $\beta$ is a measure of mobility. In our case, $y$ measures the percentage of a healthy life year in which a value of100 denotes one year in perfect health and zero denotes a health state that is viewed as equivalent to death. If, for example, $\beta$ is 0.2, then this would imply 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 $\beta$ 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

[16] Friendship quality uses questions about childhood friends and loneliness. The parent relationships use information on quality of communication and closeness with the parent.

time averages of each parent and using just a single parent's health measure when only one parent is linked to a child. 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, we may prefer to use rank based measures (Mazumder, 2016). Rank-based measures are also better suited for distinguishing upward and downward mobility patterns.

Accordingly, we also develop a set of intergenerational rank mobility estimates with respect to health. We calculate the percentile rank of age adjusted health separately for each gender in each generation.[17] In addition to health 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.[18] Similarly, we also construct an "all children" health rank that pools together the age-adjusted child health measures for sons and daughters. We then estimate regressions[19] 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, $\rho$ provides an estimate of persistence in rank position and 1- $\rho$ provides a measure of positional mobility. We will often refer to $\rho$, which is equivalent to the Spearman correlation as the "rank-rank slope." In principle, $\beta$ and $\rho$ can differ. It could be for example, that if the health distribution becomes more compressed in the

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

[18] 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.

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

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 also use the rank-rank regression framework to calculate expected ranks at the 25th and 75th percentile. These estimates at "p25" and "p75" provide additional useful statistics for conveying information about "directional" (upward or downward) mobility for a typical child coming from lower and higher health families.[20] 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.[21]

For studying income mobility, we rank total family income in the same way as for health, by gender and generation, after performing the same age adjustment. Similar to health ranks, 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.[22] We then 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.

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. However,

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[20] Of course, using the intercept and slope one can easily calculate the expected rank at any percentile of interest. Chetty et al (2014) highlight the p25 measure and refer to this as a measure of "absolute mobility". We don't think that is an appropriate term since the expected rank is a measure of relative mobility. In principle, everyone's health could deteriorate in absolute terms, even if say the expected rank at p25 is the 50th percentile.

[21] 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.

[22] If the mother and father are in the same household, this average is merely the total family income of that year.

when we examine trends, parent and child age adjusted health ranks are estimated based on cohort specific joint distributions depending on the child's birth cohort.[23]

*Alternative Health Index (AHI)*

As a robustness check, we develop an alternative health index (AHI) that is constructed from objective health measures that are only available in survey years after 1999.[24] 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-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.

## 4. Results

In this section, we present our results. We first present our main estimates of intergenerational health mobility using our different mobility measures in Section 4.1. Then, we will consider the robustness of these baseline results to measurement issues in Section 4.2. We next explore the relationship between health and income mobility in Section 4.3. We then measure how health mobility differs across subgroups of the population (Section 4.4) and how it has changed over time (Section 4.5). Finally, in Section 4.7, we consider potential mechanisms that can explain our results on intergenerational health mobility.

[23] The trends analysis uses cohorts born in each of the following birth cohort groups:1950-1960; 1960-1970; and 1970-1979. These cohort groups comprise about 80% of our baseline sample.
[24] 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.

4.1 Intergenerational Health Mobility

*Basic Descriptive Patterns*

Before turning to our main mobility estimates, we start by showing some simple associations between parent and child health in Appendix Table 1 that are easy to interpret. For this analysis 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.[25] 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 the extent to which associations differ among parents within the 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*

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

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 estimate is higher than either using only mother's health (0.20) or using father's health (0.17). 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. These estimates are all markedly lower than what is typically obtained when estimating the intergenerational elasticity in family income in the U.S. which tends to be around 0.5 or higher (Mazumder, 2016). This suggests that there is much greater mobility with respect to health than with respect to income which is an issue which we revisit below.

We next turn to estimates of rank mobility. In panel A of Table 4, we show estimates of the rank-rank slopes, expected rank at 25$^{th}$ and 75$^{th}$ percentile for each parent-child sample. Estimates for the rank-rank slopes range from 0.21 to 0.29, suggesting that for every 10-percentile rank increase of the parents, the child is expected to be 2 to 3 percentiles higher in the health distribution of their own generation. Similar to the intergenerational health association results, we find the strongest association between mothers and daughters. Expected rank at the 75$^{th}$ percentile is similar across the samples, ranging from 56 to 60$^{th}$ percentile. Daughters experience lower downward mobility than sons when either the mother or the father is at the 75$^{th}$ percentile of the health distribution. Both sons and daughters have similar expected ranks when the mother or father is at the 25$^{th}$ percentile of the parent health distribution. Finally, the transmission of health across generations is larger for mothers than it is for fathers i.e. the mother-son and mother-daughter slopes are both larger than the father-son and father-daughter slopes in the first column.

We contrast these results with income mobility estimates for the same samples in panel B. The estimates for the rank-rank slopes range from 0.41 to 0.47, implying a much greater persistence in income rank than in health rank. These estimates 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. Mazumder (2016) demonstrates that the rank persistence estimates in Chetty et al (2014) are downward biased due to using short time averages of income and using measures taken at sub-optimal points in the life-cycle, which are issues that can be overcome by using the longer panel data available in the PSID. 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.[26] Whether we focus on the IHA or rank mobility estimates, we find that the estimates are remarkably similar across the two measures. 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. We draw two main conclusions from this analysis. First, SRHS is at least as informative of latent

[26] 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. See the discussion in Section 3 and Appendix B, for details on the construction of the AHI.

health as more objective measures and second, our lower estimates of intergenerational health persistence compared to income persistence are likely not driven by differences in measurement error between income and health.

## 4.2. Measurement Issues

*Time Averaging*

Research on intergenerational income mobility has emphasized the importance of measurement error/transitory shocks and lifecycle biases in producing accurate estimates of intergenerational associations in lifetime status (e.g. Solon, 1992; Mazumder, 2005; Haider and Solon, 2007, Mazumder, 2016). In the income mobility literature, it has been shown that longer time averages of parent income reduces the attenuation bias from these sources. 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, and we vary this threshold at 5, 7, 10 and 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 IHA using a pooled sample of sons and daughters are shown in Figure 3. We find that increasing the number of years in the parent time average leads to progressively higher estimates that plateaus once we have a time average of about 10 years (or less). For example, in Panel A when using the sample where mother's health status was observed for at least 15 years, estimates increase from 0.15 to 0.25 as we increase the length of the time average from 1 year to 10 years. Similarly, for fathers (Panel B), the estimates roughly double from 0.11 to 0.20 over the same range. 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.

In Figure 4, we plot the analogous graphs for rank-rank slopes. In this case, we estimate the models separately for each parent-child pair. Attenuation bias is also apparent in the rank-rank models, but the degree of bias varies a bit across the types of parent-child pairs. For example, when we examine the father-daughter sample, the estimates gradually rise from 0.16 to 0.30 as the time average moves from 1 year to 11 years. In contrast, the mother-son rank-rank slope (Panel A) estimates quickly increase from 0.19 to 0.25 with just a few years of data on mothers' health. Overall, this suggests that time averaging may be as important for rank-rank slopes in health as it is for estimating the IHA. 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.

*Life Cycle Bias*

We next consider how the estimates differ depending on the age of parents and children at the time their 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. In panels C and D of Figure 3, we find that the IHA estimates tend to fall as we measure parents' health at later ages. For example, the IHA between fathers and the pooled sample of sons and daughters is 0.25 for fathers between the ages of 30-39 and 0.15 for fathers between the ages of 60-69. The analogous figures for mothers are 0.22 and 0.17. In panels E and F, we do the same type of exercise where we now vary child age. Here we see the opposite pattern, the IHA estimates are larger when children's health is measured later in the life-cycle, particularly for the father-child IHA.

There are two 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 also alter the age composition of the other generation. To address the issue of compositional bias, in panel A of Appendix Table A.3, we present a set of IHA estimates for all combinations of parent and child age bins. These estimates tend to be even noisier. With respect to compositional biases, we find that when we restrict the sample to older age children (e.g. over 50), 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. Samples that match older children to older *mothers* appear to produce the highest mother-child IHA estimates. However, this is not as clear for samples that match older children to older fathers. We find the highest IHA estimates when the child and father are both at least 60. Overall, given how noisy the estimates are, we are hesitant to draw any firm conclusions about how the age structure of the data may affect IHA 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 is measured later in the lifecycle. 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.[27]

In Figure 4 (panels E, F, G and H) and Appendix Table 3 (panels B and C), we do a similar set of exercises for the rank-rank slope.[28] In contrast to the IHA, we find that the rank-rank slope estimates tend to be more stable. Nevertheless, we again find that the highest estimates generally obtain when both the child and parent are at least 50 years old and that the highest estimates between fathers and their children are obtained when both fathers and their children are between 60 and 69.

### 4.3 Relationship between Health Mobility and Income Mobility

In this section we examine the degree to which families that experience intergenerational health mobility also experience intergenerational income mobility. We begin by documenting the correlation in *levels* between health status rank and income rank in each generation. In Figure 5, we plot the mean health rank at each income percentile for sons, daughters, mothers and fathers. Across the samples, we find a

[27] 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.
[28] Percentile ranks are calculated separately for each age bin.

correlation between health and income ranks, ranging from 0.33 to 0.48.[29] This is reflective of the gradient or the ubiquitous correlation between socioeconomic and health status.

We now turn to examining the correlation in the *change* in health rank across generations and the *change* in income rank across generations.[30] This allows us to identify the degree to which health and income *mobility* is correlated across families. Figure 6 shows that there is a positive and almost linear relationship between health and income mobility. Not surprisingly, the correlation in differences is lower than in levels and ranges from between 0.23 to 0.26. The fact that the correlation in differences is somewhat low suggests that those individuals who move up in income ranks are generally not the same as those who move up in health ranks.[31] Income and health, therefore, appear to capture related but also somewhat distinct dimensions of socioeconomic status. Hence, policies that target income mobility may not necessarily impact health mobility. For example, it is possible that individuals experiencing income mobility could suffer health consequences perhaps due to greater stress.[32]

4.4 Health Mobility by Subpopulations

In this section we 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] In Table 6, we report the rank-rank slopes and the expected ranks at 25th and 75th percentile by childhood region, race and parent's education for all children using both parents' health.

[29] The correlations are higher in the parent generation. This is likely due to the fact that we have more years of data for the parents which allows us to better capture lifetime latent health status and income and thereby reduce attenuation bias.
[30] The change in rank is simply the difference in percentile ranks between the parent and child in each respective generation. A positive change is indicative of upward mobility while a negative change implies downward mobility.
[31] Appendix Table 4 shows that the correlations between income and health mobility also differs substantially across population subgroups. Correlations are generally much higher for whites than for blacks and tend to rise with parent's education level.
[32] Miller et al. (2015) show that low SES black youth with high levels of self-control experience improved outcomes such as lower rates of depressive symptoms, substance use, aggressive behavior, and internalizing problems but faster epigenetic aging based on biomarkers. They suggest that "outward indicators of success can mask emerging problems with health." Azagba and Sharaf (2011) link more stressful jobs to higher medical expenditures.
[33] Results for each parent-child sample are shown in Appendix Tables A.4 and A.5 and the corresponding figures are plotted in Appendix Figures A.6, A.8 and A.10. We also report additional measures of upward and downward mobility, such as escaping bottom quintile, by subpopulations in Appendix Table XX.

Figure 7 plots the predicted percentile of the child's health rank at each percentile of the parent's health rank from the associated rank-rank regressions.

We begin by exploring the difference in health mobility across the regions of the United States in which the child grew up. While the rank-rank slopes are similar across the regions, growing up in the South is associated with a lower rate of upward mobility. 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 have better health than 46% of the population. An F-test shows that these regional differences in upward mobility are statistically significant at the 10 percent level. Downward mobility from the top 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. However, in this case the F-test does not show a statistically significant difference in expected rank at the 75th percentile. The disparity between regions in health mobility, however, is not as great as it is for income mobility (Table 6 columns 5 and 6) showing once again that there may be important distinctions between health and income mobility.

Health mobility also differs substantially by race. Here we focus on the gaps in upward and downward mobility as captured by the expected ranks at the 25th and 75th percentiles.[34] We find that blacks experience both lower upward mobility from the bottom and higher downward mobility from the top. 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, a 10 percentile point difference. This gap continues to increase throughout the parent rank distribution with blacks expected to experience

[34] We find that persistence in health rank is higher for whites than for blacks which suggests greater mobility within the black population in terms of regression to the mean in health rank. However, it does not convey how blacks fare in terms of their expected position in the overall distribution which is important since the distribution of health is very different across the two groups.

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

In contrast, the racial gaps in income mobility are much 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 Figure 8, we plot these black-white "mobility gaps" in health and income throughout the distribution of health and income.

Lastly, we examine the health mobility by parent education level. The association between parent and child health rank are similar across the different parent education levels. A 10 percentile point increase in parent health rank leads to about a 2 percentiles increase in child health rank for each subsample. However, the expected rank at the 25th percentile differs significantly. For children with parents at the same health percentile, those with parents with a college degree are expected to have better health than nearly 52% of the children, but those with parents without a high school degree are only expected to have better health than 37% of the children. This disparity is evident throughout the parent health distribution. 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 status (Case et al. 2002).

4.5 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 Figure 9. For this

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

analysis, we use only health observations from age 30 to 40 for children and from age 40 to 70 for parents.[36] Figure 9 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.6, 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 Figure 10, we plot the rank-rank slopes (Panel A) and expected health ranks at the 25th and 75th percentile (Panel B) for the three birth cohorts.[37] Unlike intergenerational health associations, we find more limited evidence of an increase in rank-rank slopes. While the point estimate increased from .23 to .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 recent cohorts. In Appendix Table A.7, 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 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. Davis and Mazumder, 2017) and a decline in intergenerational educational mobility reported by Hilger (2017). Nevertheless, since the most recent cohorts (born since

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[36] The age cutoffs are chosen to capture most of the available 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 in Appendix Table A.6.

[37] 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.7.

1970 are still relatively young, future work may be able to better substantiate whether a change in health mobility has taken place.

### 4.6 Potential Mechanisms

*Does Health Insurance Matter?*

Earlier we raised the possibility that social policies and institutions may explain why there is a lower degree of intergenerational transmission of health compared to income. A growing literature has linked access to health care, particularly early in life, to long-run socioeconomic outcomes (e.g. Chay et al, 2009; Goodman-Bacon, 2016; Miller and Wherry, 2017). In this section we consider the potential role of access to health insurance and whether it might play a role in reducing the intergenerational transmission of health status. To examine this issue, we used questions available in the early years (1968-1972) of the PSID on whether all members of a household were covered by health insurance (during the individual's childhood years).[38] This requires us to use a subsample of our main estimation sample for which this data is available.[39] Of course, access to health insurance coverage is certainly not exogenous and is more likely to be available for better educated and higher income families. To make at least a minimal effort to address this potential confounding factor, we also control for family background (parent education and family income) in some specifications.[40]

The results of this exercise are shown in Table 7. We first show that the basic rank mobility statistics for the overall subsample are very similar to our baseline sample. For example, we estimate a rank-rank slope of 0.243 (0.024) which compares to an estimate of 0.261 (0.017) when we use our full sample (see Table 4). We then divide this subsample into those who were covered by insurance at least one year during

[38] Prior to 1999, except for a few exceptions, health insurance coverage data were only collected in the PSID from 1968-1972, where the head of the household is asked whether he/she is covered and if the insurance covered the whole family. Only Medicare and Medicaid coverage data were collected between 1977 and 1997.

[39] Specifically, we keep only parent-child pairs where the child was between the age of 0 and 16 and his/her family was surveyed during the years 1968-1972.

[40] To control for family background, we use the residuals from regressing health status on age, age squared, family income and parent education levels for the child's health measure.

childhood (age 0-16) and those who never had coverage. We find that rank-rank slope for the former is 0.21 and the rank-rank slope for the latter is 0.35. The difference of 0.135 (0.068) is statistically significant at the 5 percent confidence level. We also do an analogous exercise where we first control for family background characteristics in a regression and then produce rank mobility estimates using the residuals. We again find a very similar difference in the rank-rank slopes between the two groups of 0.127 (0.066) which is statistically significant at the 10 percent level.

We do not take the results of this exercise as definitive given our data limitations. Ideally, we'd like to combine very large sample sizes with a better research design (e.g. changes in Medicaid expansion) to more credibly assess the role of health insurance access on health mobility. However, we take these results as at least suggestive that widespread access to health insurance may contribute to the relatively low level of health persistence observed in the U.S.

*The Role of Childhood Circumstances*

We now 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 11 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 in combination lower the IHA 0.154 accounting for about 36% of the unconditional IHA but of this percentage, family socioeconomic background matters the most. Interestingly, the socioeconomic background of the parents appears to matter more than the child's health status in explaining the transmission of health status across generations. Finally, panel B, depicts the associated estimates when controlling for one variable at a time, rather than using whole categories.

In Figure 12, we do an analogous breakdown of the rank-rank slope and find very similar patterns. Our baseline estimate is 0.292 which falls to 0.232 if we control for family SES background variables and 0.223 if we include all of our controls. In the case of rank persistence, therefore, we can account for 24 percent of the baseline estimate.

## 5. Conclusion

Given the rise of inequality and concurrent concerns about unequal opportunity, studies of intergenerational mobility have received growing attention. Most studies have focused primarily on income, education, or occupation. However, the extant literature has largely neglected health despite its central importance to welfare. To fill this void, we provide the first estimates of intergenerational mobility with respect to lifetime health in the U.S. by using repeated measures of self-reported health status available in the PSID. We find that there is a substantially higher degree of health mobility than income mobility.

One explanation for this pattern is that policies and institutions in the U.S. may be much more effective at breaking intergenerational linkages in health than in labor market outcomes. For example, the well-documented gradient in school quality by income in the U.S. (Reardon, 2011) likely contributes to the intergenerational income dependence. In contrast, the availability of a modern public health infrastructure such as providing clean air and water, combined with access to adequate nutrition and health care for the vast majority of children, may have diminished the intergenerational transmission of health status. We find suggestive evidence that access to health insurance during childhood reduces intergenerational health persistence. It may also be the case that income persistence in the U.S. had been more in line with health persistence in the past, but has risen in more recent decades as inequality and the returns to schooling have grown (Aaronson and Mazumder, 2008; Davis and Mazumder, 2017).

We also find that that there is a relatively low correspondence between the families which experience income mobility and those that experience health mobility. So, while it is true that in any given generation, health and income are highly correlated, it is not necessarily the case that both health and economic status are equally transmitted to the next generation. Consequently, some adult children might be as well off as their parents economically, but not necessarily in terms of health (and vice versa). Hence, health appears to captures a distinct dimension of socioeconomic status than income.

In addition, given recent research suggesting a decline in intergenerational mobility with respect to education and income (e.g. Hilger, 2017; Davis and Mazumder, 2017) we also investigate time trends in intergenerational health mobility. We find suggestive evidence of a decline among more recent cohorts born since 1970. Further research that follows these cohorts to later ages may be useful in corroborating this finding.

Finally, we also document important differences in intergenerational health mobility by region, race and parent education levels. We find that blacks experience significantly less upward mobility and significantly higher downward mobility than whites. However, this racial mobility gap in health is smaller than the analogous racial mobility gaps in income. Children of less educated parents are also similarly disadvantaged when it comes to health as compared to children of well-educated parents. Like income, the disparity in health persistence by education is smaller for health than for income.

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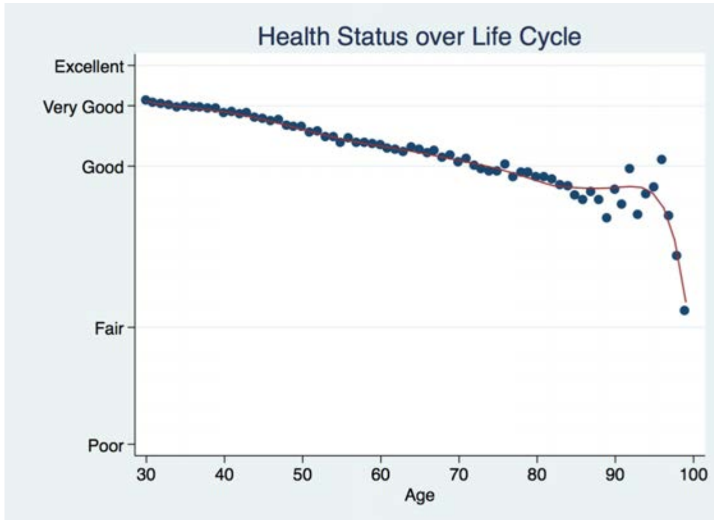
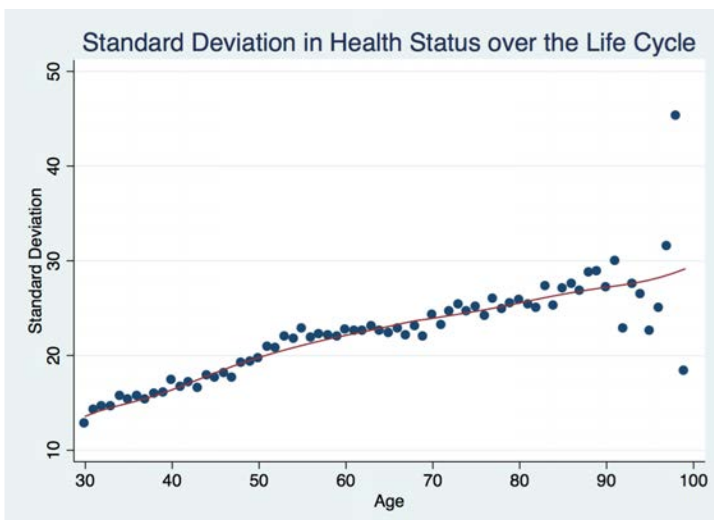
Figure 1: Health status over life cycle



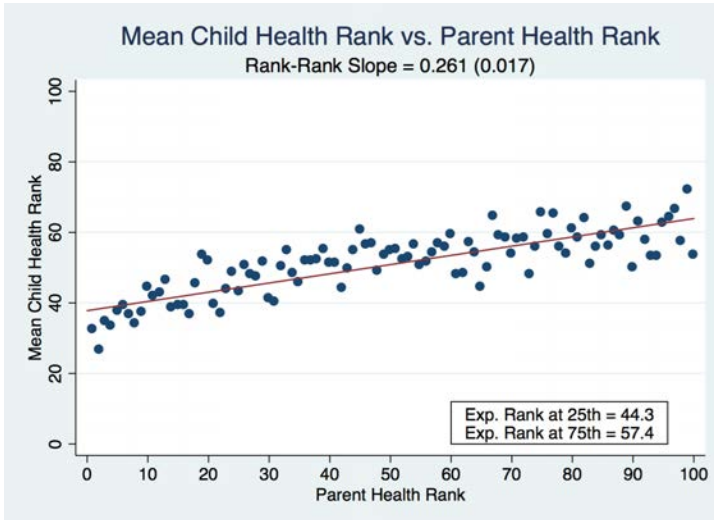

(a) Mean health status by age



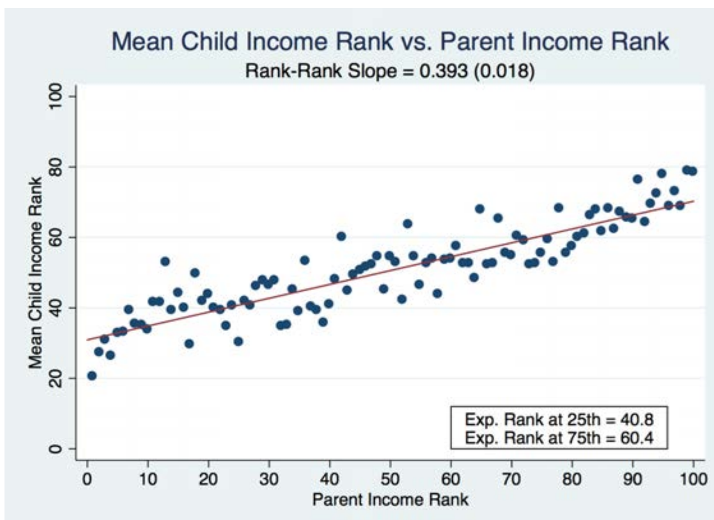

(b) Standard deviation by age

Panel A of Figure 1 plots the mean continuous health measure at each age for the full sample and includes all generations and genders. The mean at each age is weighted using the most recently available individual weights. The red line is a fitted local cubic polynomial using the Epanechnikov kernel. 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. Panel B plots the standard deviation at each age for the same sample and is weighted using the most recently available individual weights. The red line is a fitted local cubic polynomial using the Epanechnikov kernel.

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



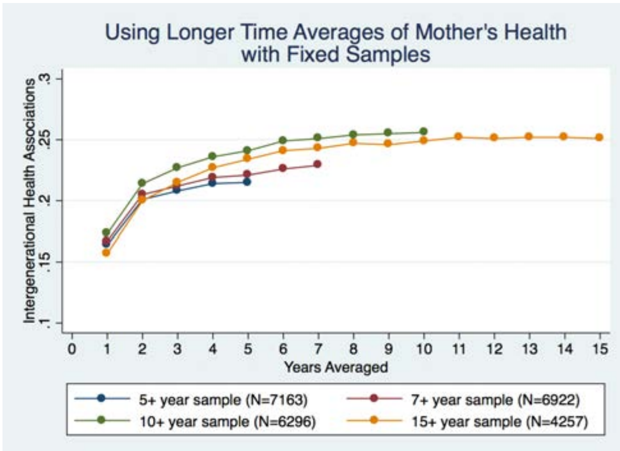

(a) Health rank mobility



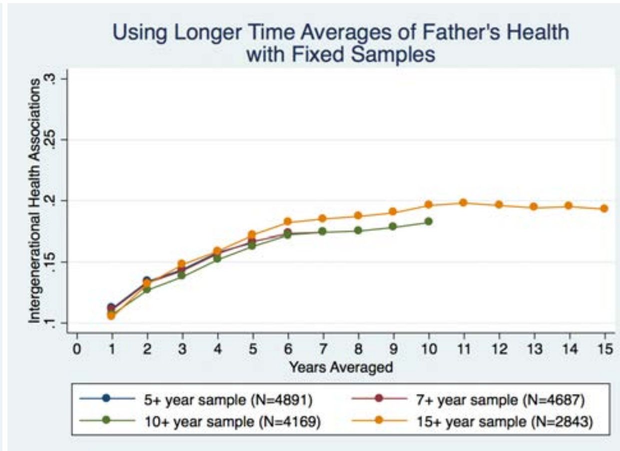

(b) Income rank mobility

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.

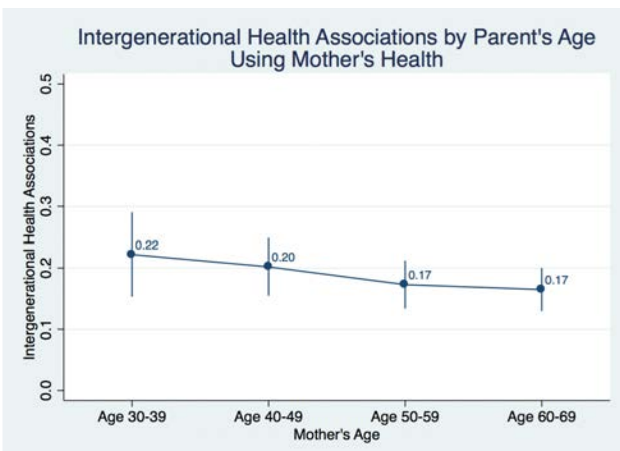
Figure 3: Robustness of intergenerational health associations



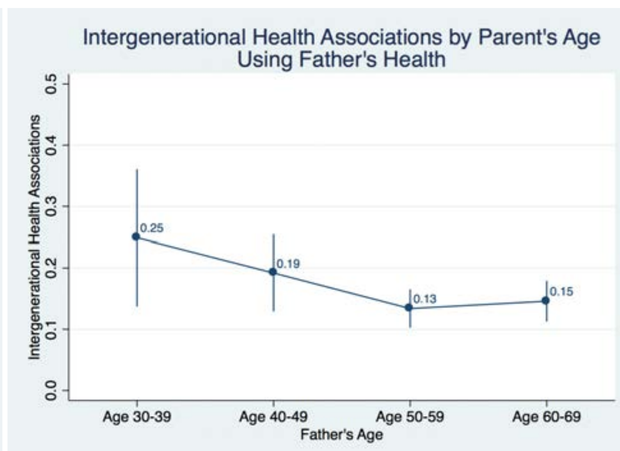

(a) Attenuation bias: varying years of parent health measurement using mother's health




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

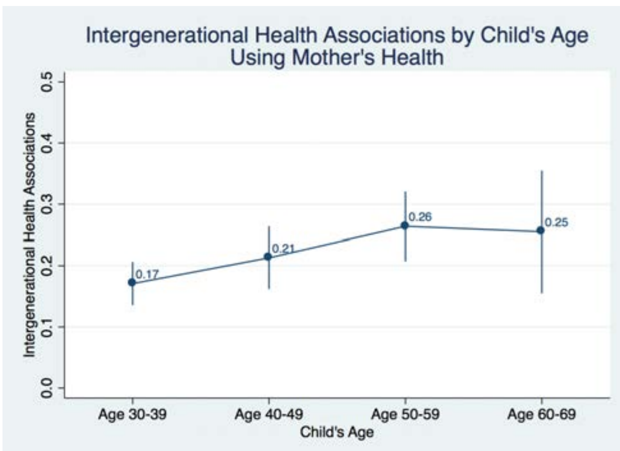



(c) Life cycle bias: varying age of mother's health measurement

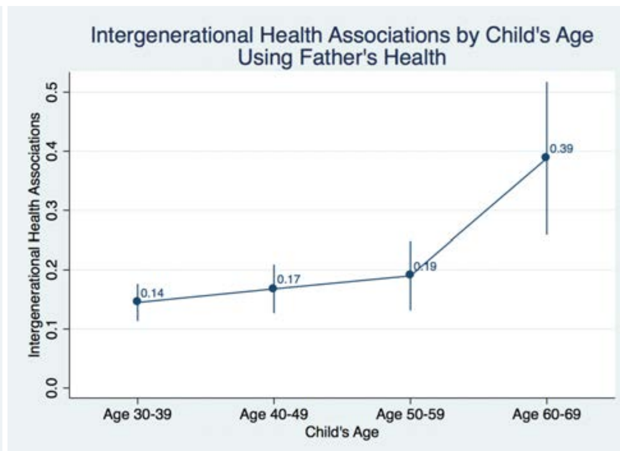



(d) Life cycle bias: varying age of father's health measurement

Figure 3: Robustness of intergenerational health associations – Continued



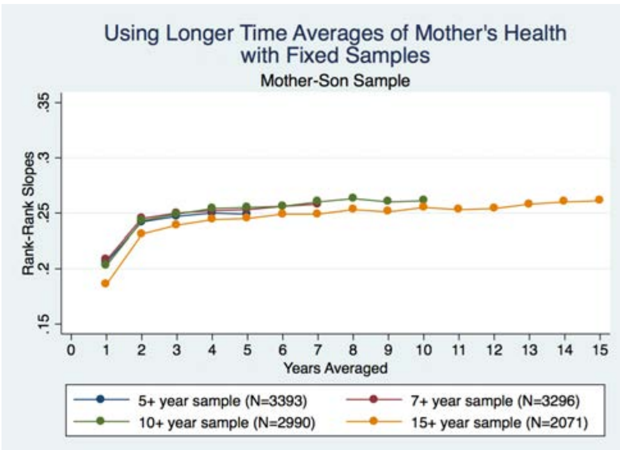

(e) Life cycle bias: varying age of child's health measurement using mother's health



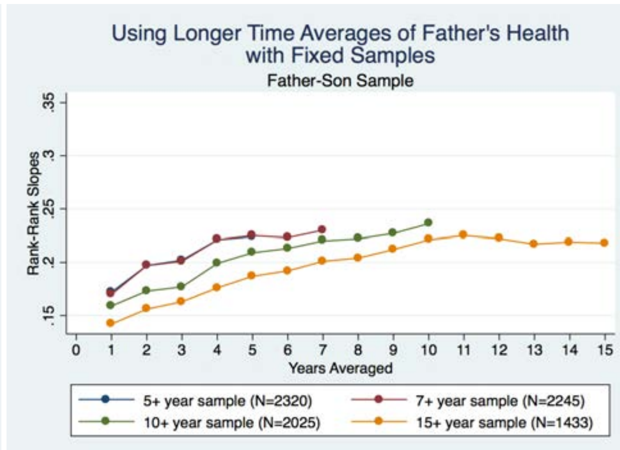

(f) Life cycle bias: varying age of child's health measurement using father's health

Figure 3 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 3, 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.

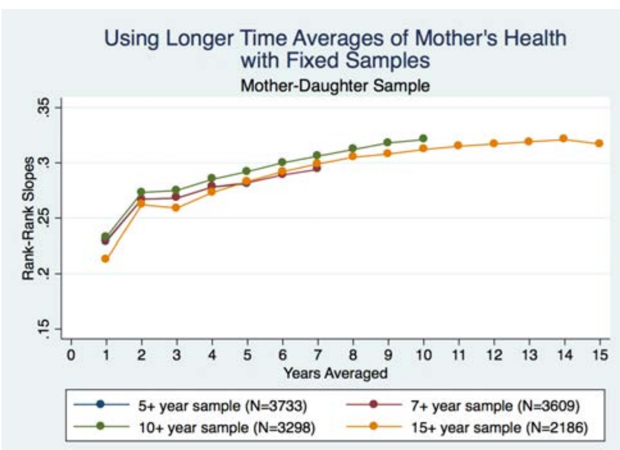
Figure 4: Robustness of rank-rank slopes



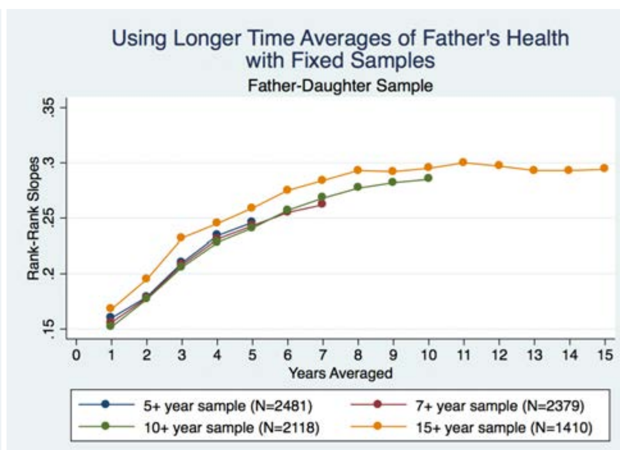

(a) Attenuation bias: varying years of parent health measurement for mothers and sons




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

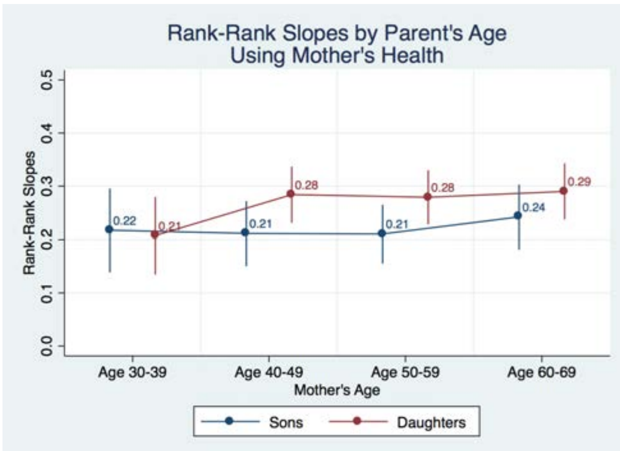



(c) Attenuation bias: varying years of parent health measurement for mothers and daughters

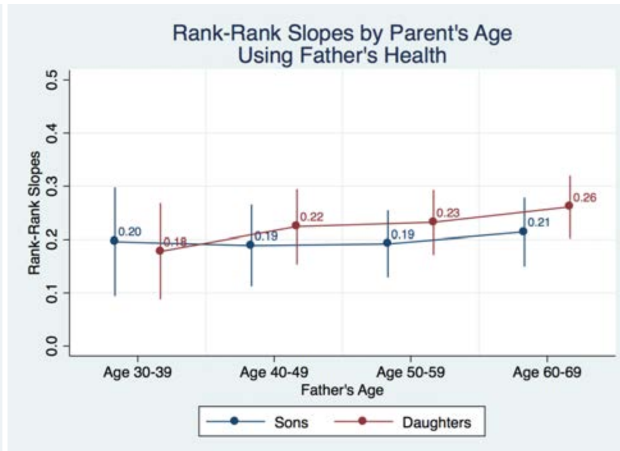



(d) Attenuation bias: varying years of parent health measurement for fathers and daughters

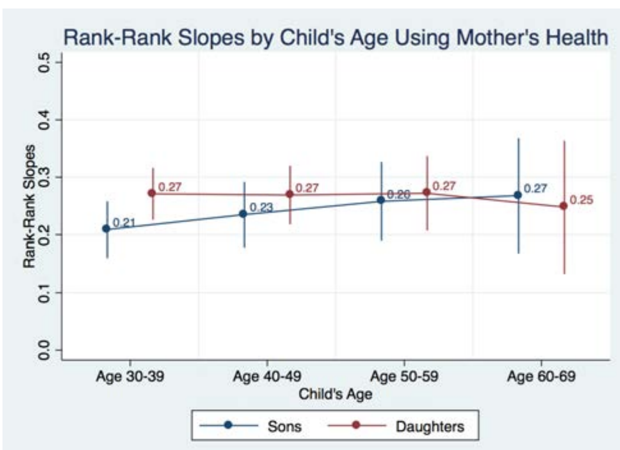
Figure 4: Robustness of rank-rank slopes – Continued



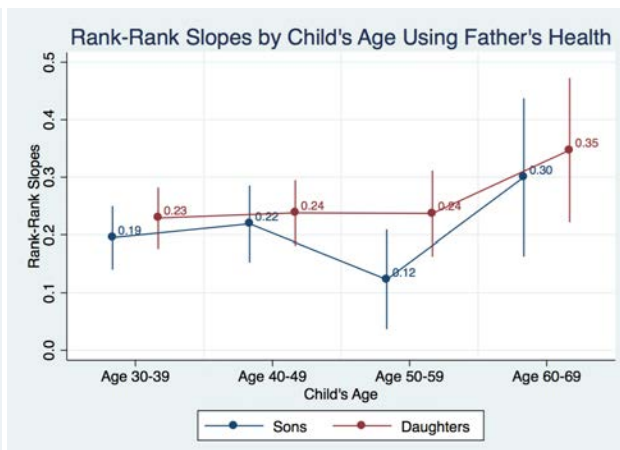

(e) Life cycle bias: varying age of mother's health measurement




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



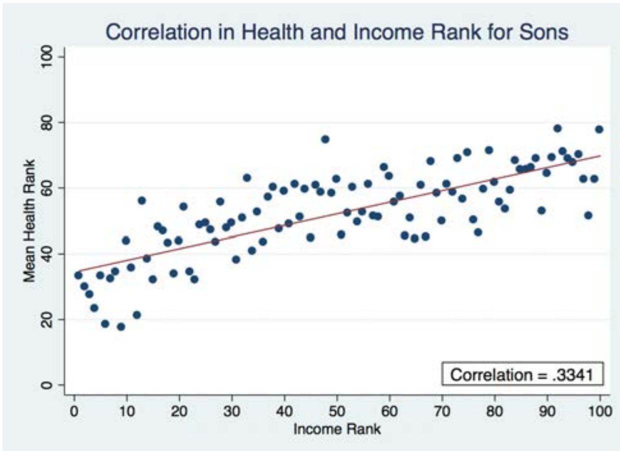

(g) Life cycle bias: varying age of child's health measurement using mother's health



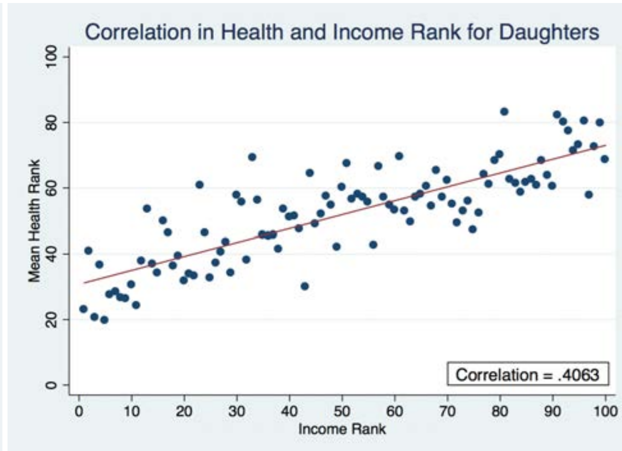

(h) Life cycle bias: varying age of child's health measurement using father's health

Figure 4 evaluates the robustness of the estimates of rank-rank slopes to attenuation and life cycle biases. Panels A to D plot the rank-rank slopes using varying time averages of mother (Panel A and C) and fathers (Panel B and D) 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 E and F 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. Panels G and H 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 4, 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.

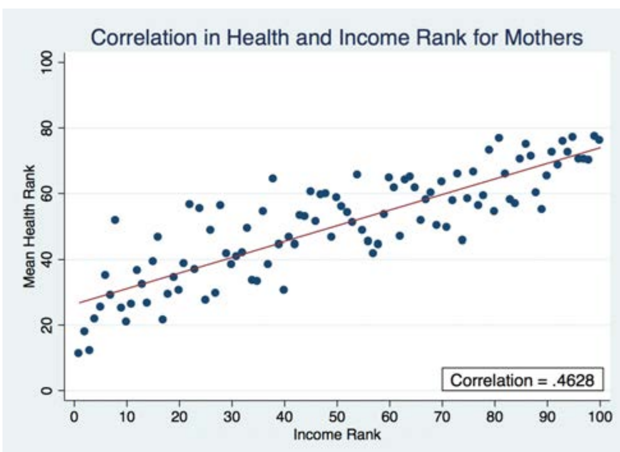
Figure 5: Correlation in health and income rank by generation



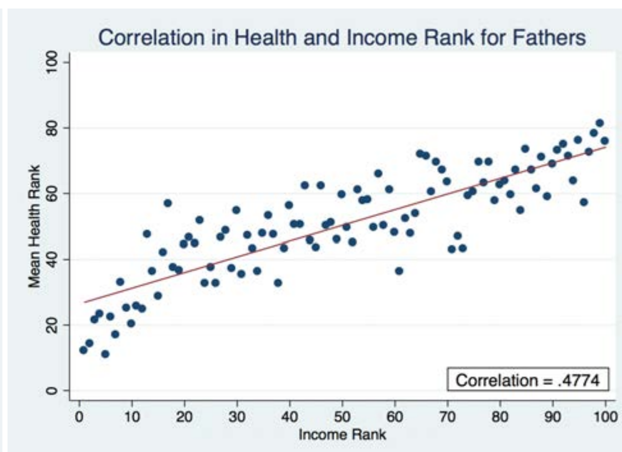

(a) Sons




(b) Daughters



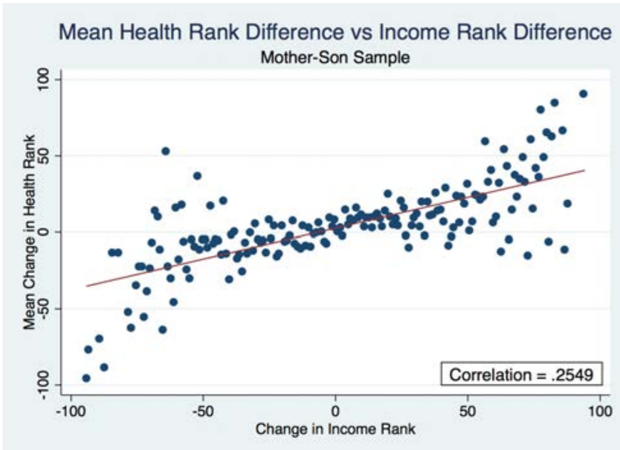

(c) Mothers



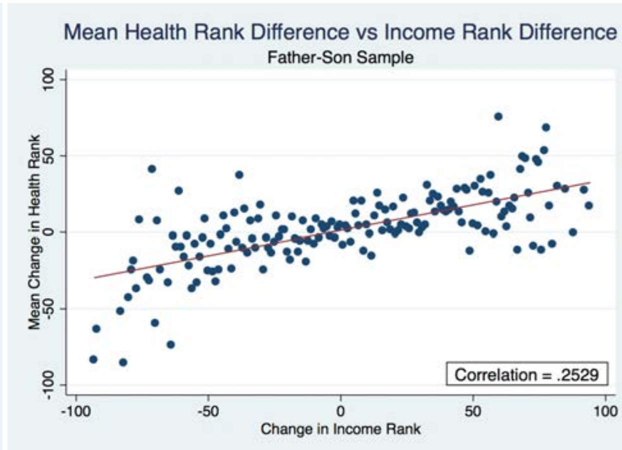

(d) Fathers

Figure 5 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.

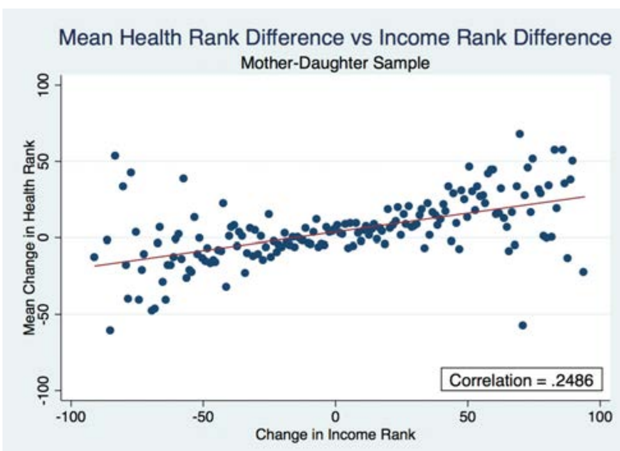
Figure 6: Correlation in health and income rank mobility by generation



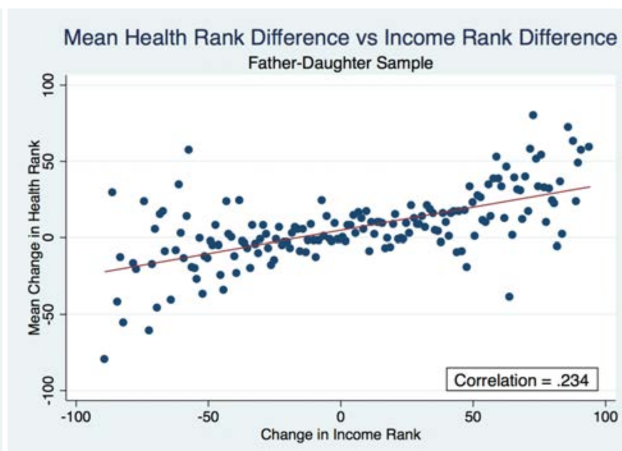

(a) Mothers and sons




(b) Fathers and sons



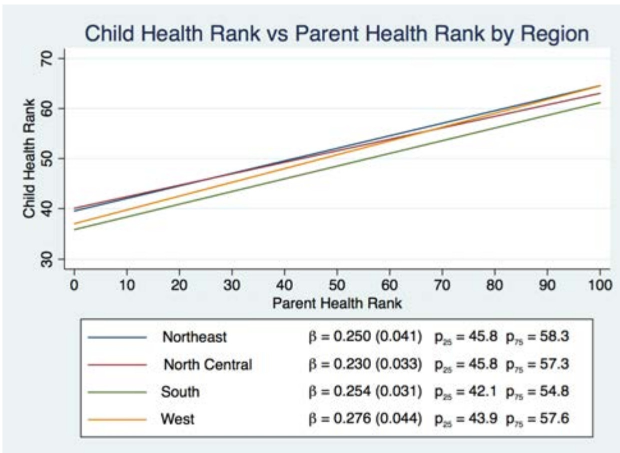

(c) Mothers and daughters



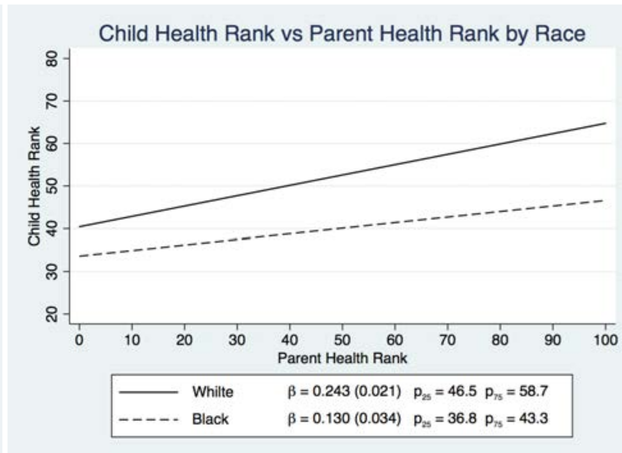

(d) Fathers and daughters

Figure 6 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.

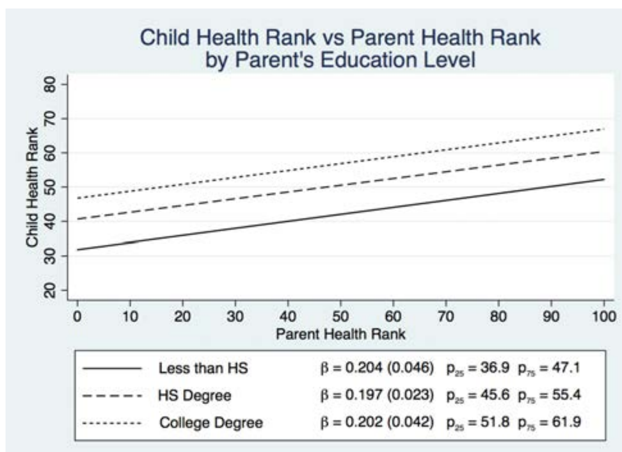
Figure 7: Health rank mobility by region, race and education




(a) Rank mobility by region



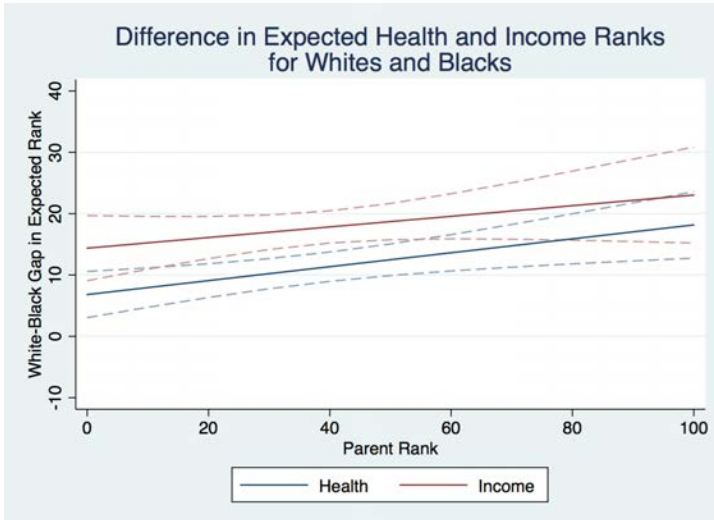

(b) Rank mobility by race



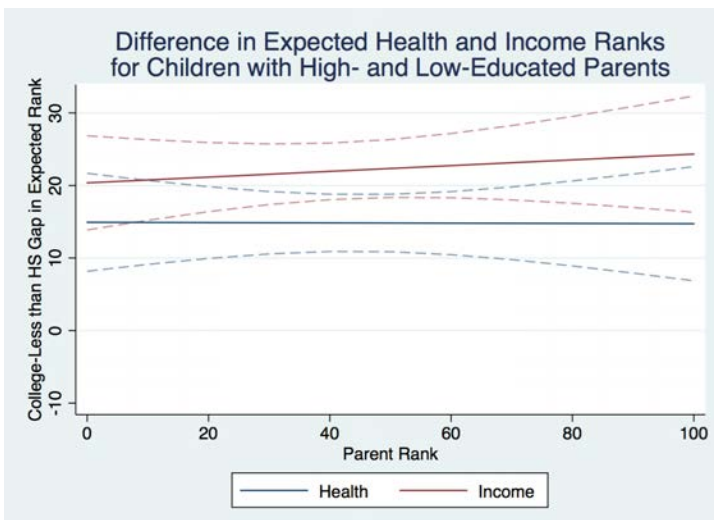

(c) Rank mobility by parent's education

Figure 7 plots estimated regression lines from the weighted bivariate regressions of child rank on parent rank by childhood region, race 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. Race refers to the reported race of the child. 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 $\beta$, 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 8: Difference in health and income mobility by race and education



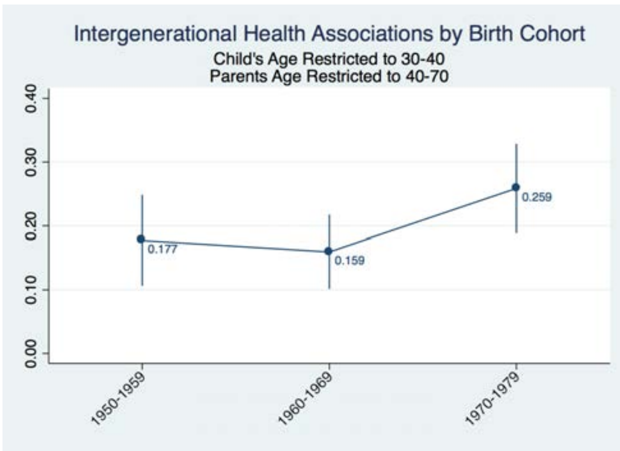

(a) Difference by race




(b) Difference by parent educational level

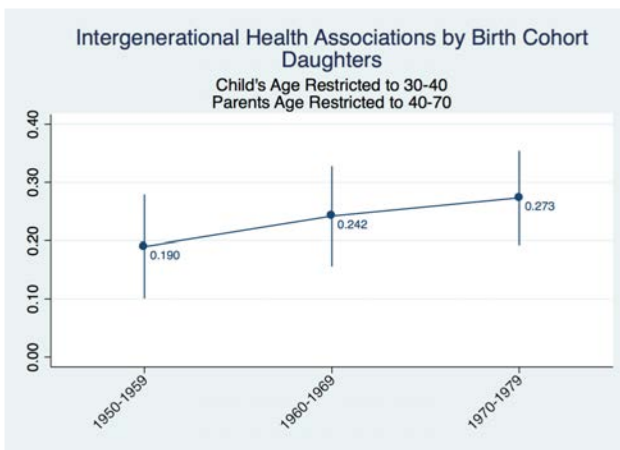
Panel A of Figure 8 plots the difference in expected rank between whites and blacks for health and income along the parent rank distribution. Panel B plots the difference in expected rank between children with parents with college degree and children with parents with less than high school degree for 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 9: Trends in intergenerational health associations




(a) All children

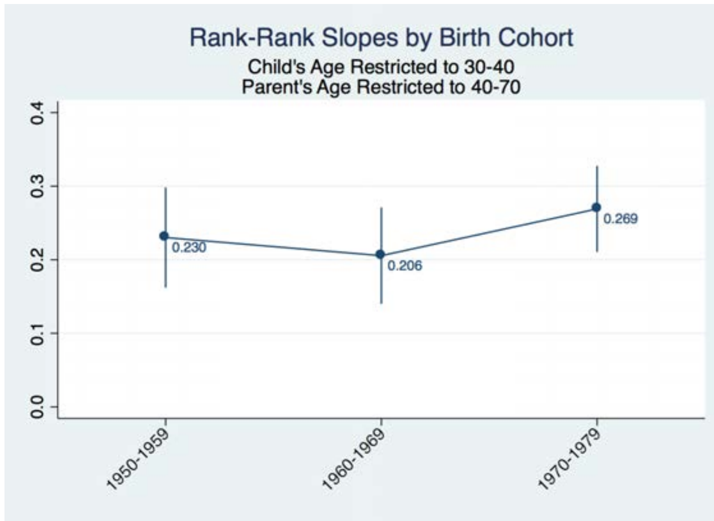

(b) Sons



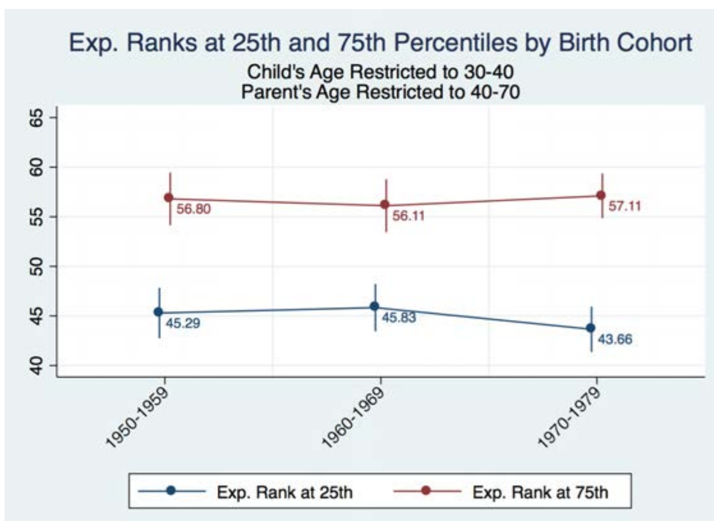

(c) Daughters

Figure 9 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 10: Trends in health rank mobility



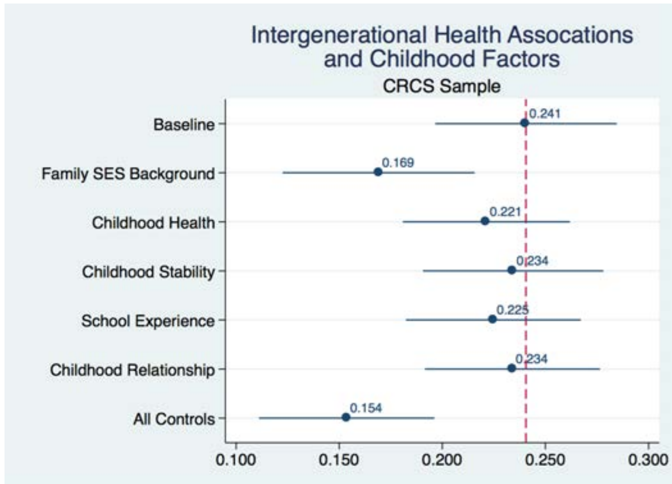

(a) Rank-rank slopes by birth cohort



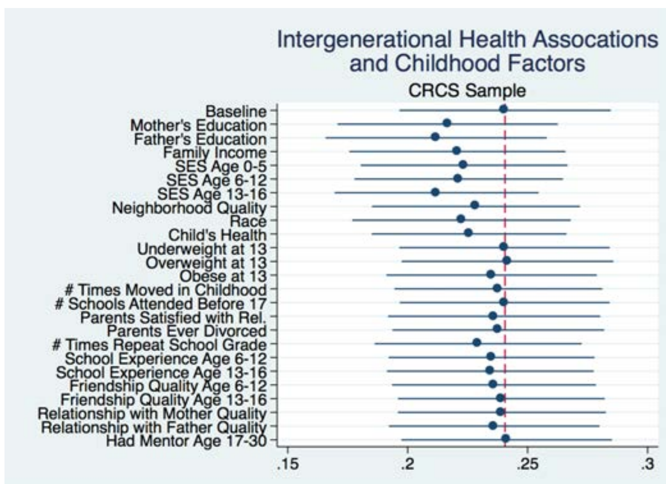

(b) Expected ranks at 25th and 75th percentiles by birth cohort

Figure 10 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 11: Effect of childhood factors on intergenerational health associations



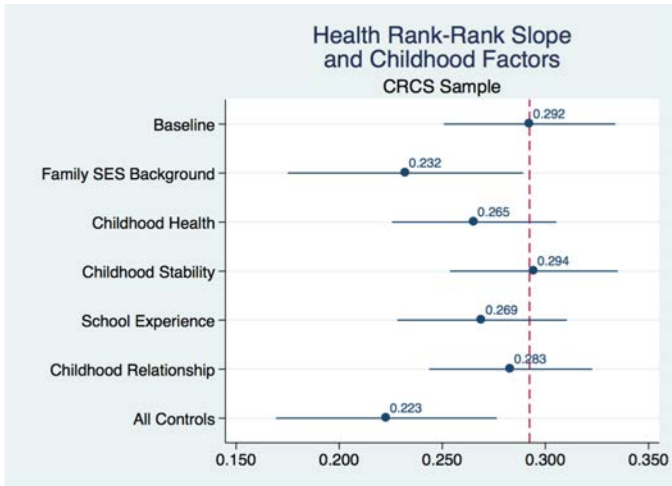

(a) Decomposition of IHA by categories of childhood factors



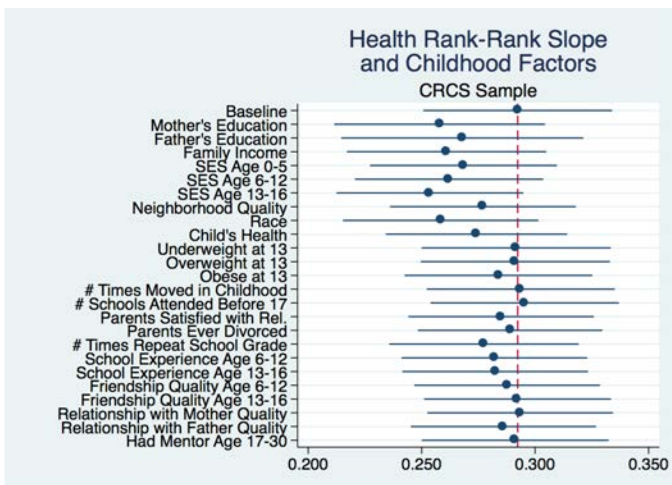

(b) Decomposition of IHA by individual childhood factors

Figure 11 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 12: 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 12 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) |

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.

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: Health and income rank mobility by region, race, 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) |
| *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 | |
| *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 | |
| *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 6 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. 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 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.

Table 7: Heath rank mobility by childhood insurance coverage

| | Rank-Rank Slope<br>(1) | Expected Rank at 25th Percentile<br>(2) | Expected Rank at 75th Percentile<br>(3) | Observations<br>(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 7 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.

## 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*

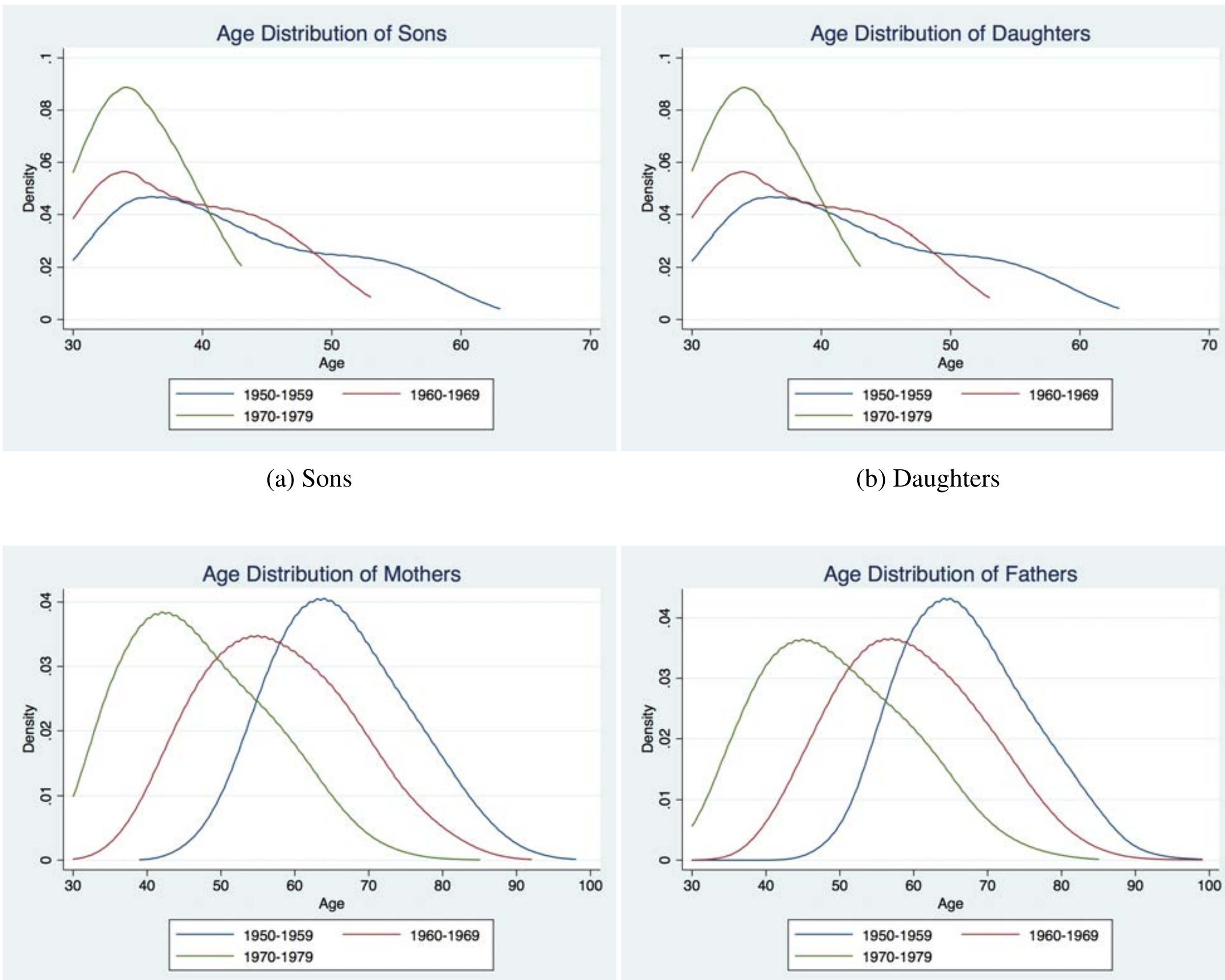
We used the following variables from the CRCS: number of times the child moved between age 0 and 16, number of schools attended between age 17, if the parents were satisfied with their relationship with each other, and if the parents ever divorced.

*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 Figures

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




(a) Sons

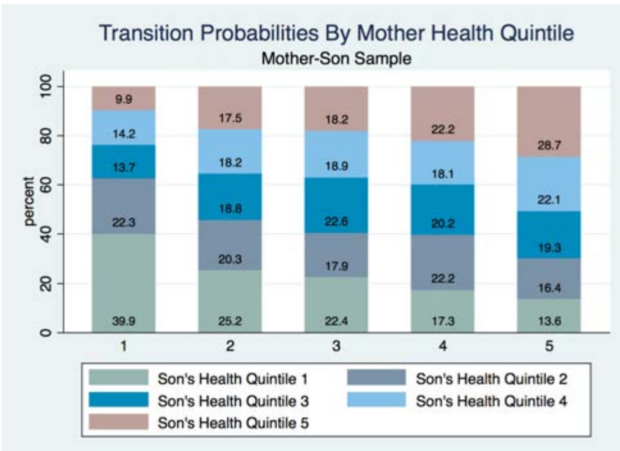
(b) Daughters

(c) Mothers

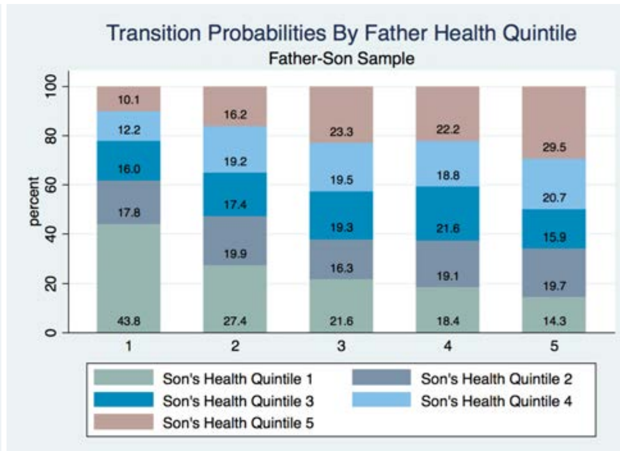
(d) Fathers

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.

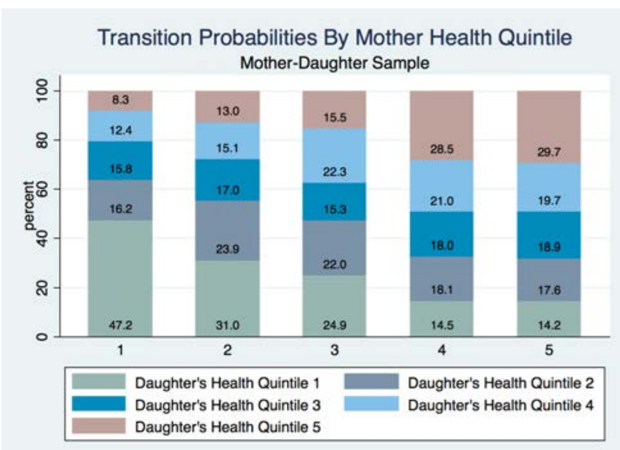
Figure A.2: Health transition probabilities by parent-child samples



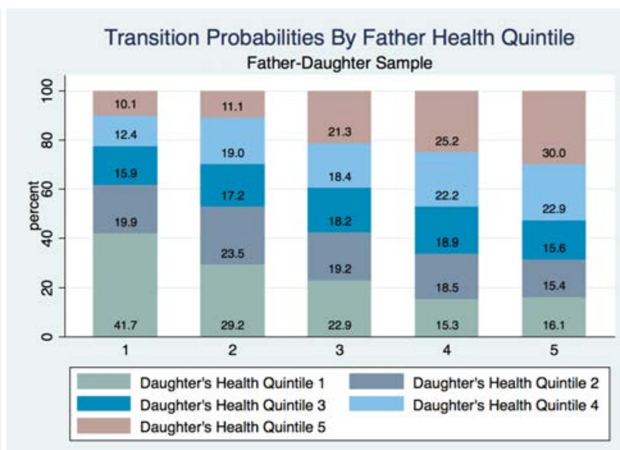

(a) Transition matrix for mothers and sons




(b) Transition matrix for fathers and sons



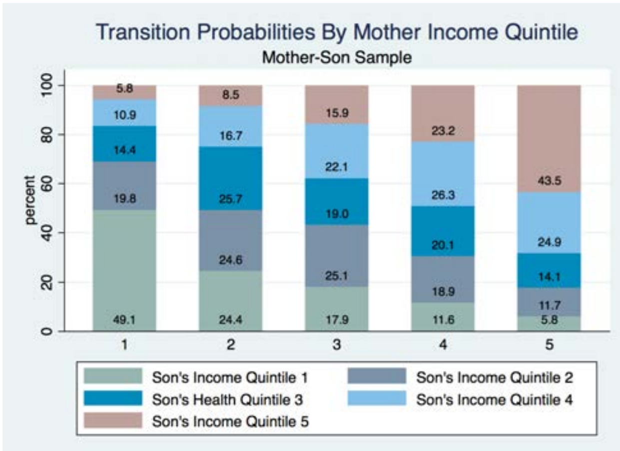

(c) Transition matrix for mothers and daughters



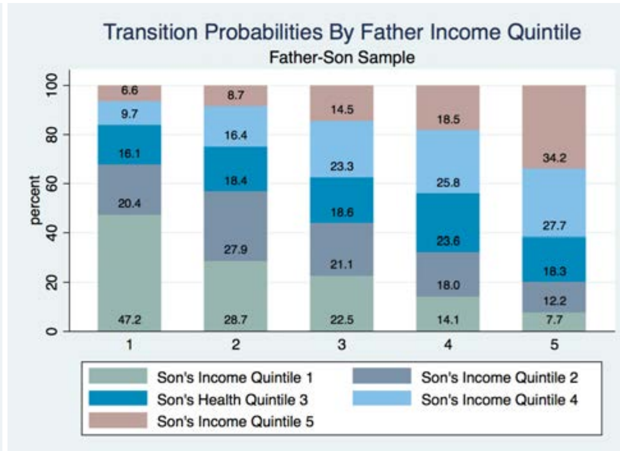

(d) Transition matrix for fathers and daughters

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.

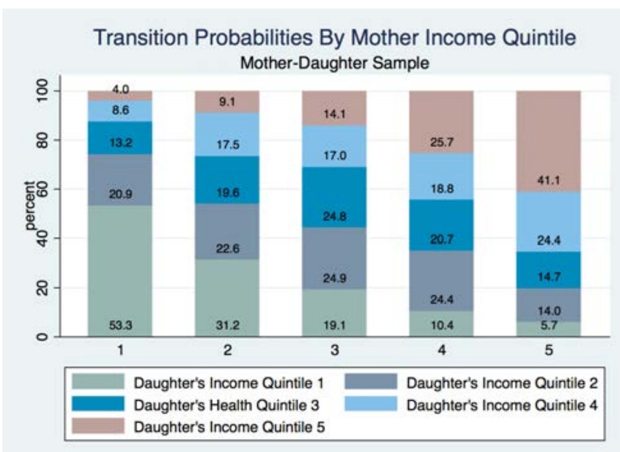
Figure A.3: Income transition probabilities by parent-child samples



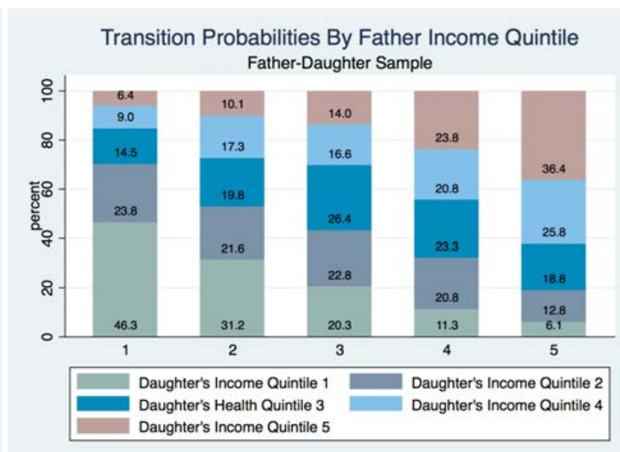

(a) Transition matrix for mothers and sons




(b) Transition matrix for fathers and sons



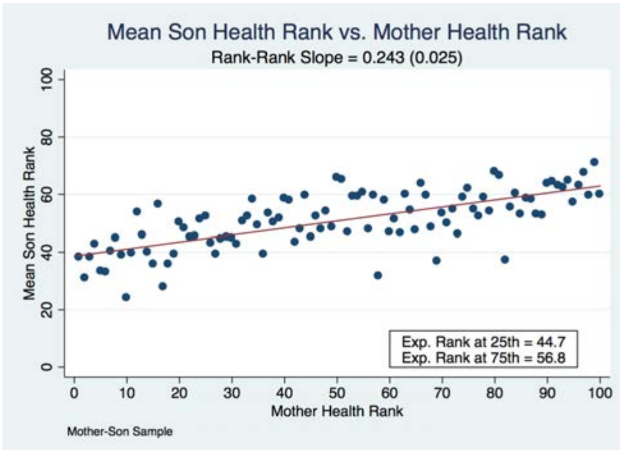

(c) Transition matrix for mothers and daughters



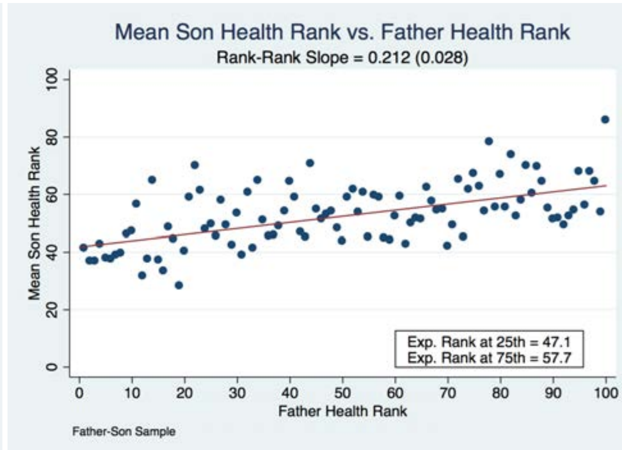

(d) Transition matrix for fathers and daughters

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.

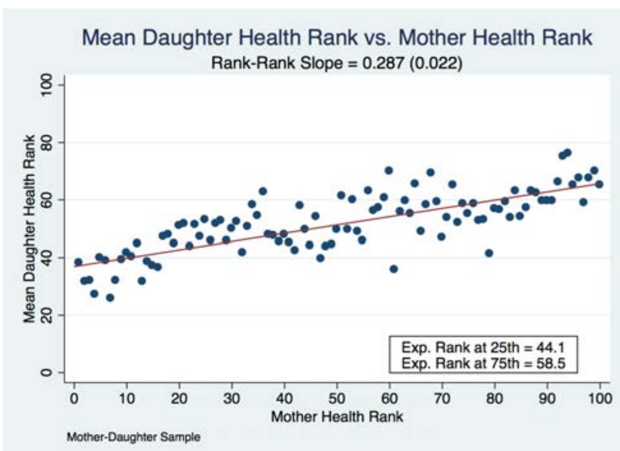
Figure A.4: Health rank mobility by parent-child samples



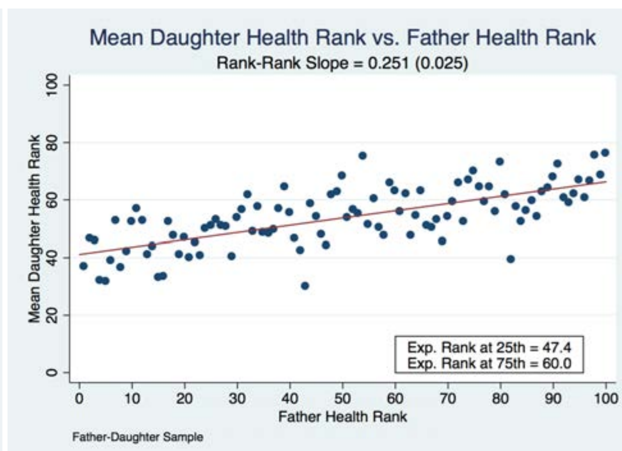

(a) Rank mobility for mothers and sons




(b) Rank mobility for fathers and sons



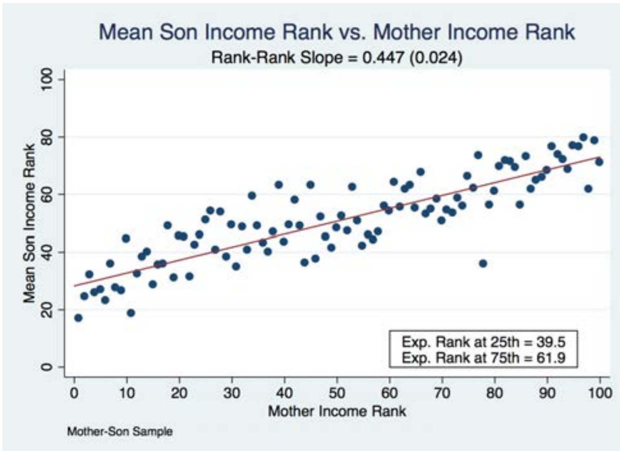

(c) Rank mobility for mothers and daughters



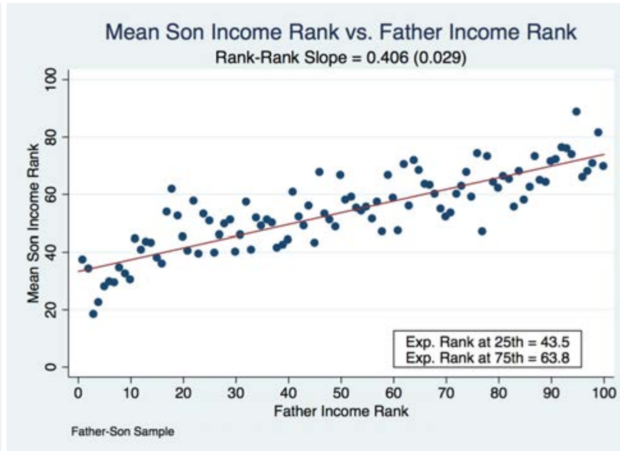

(d) Rank mobility for fathers and daughters

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.

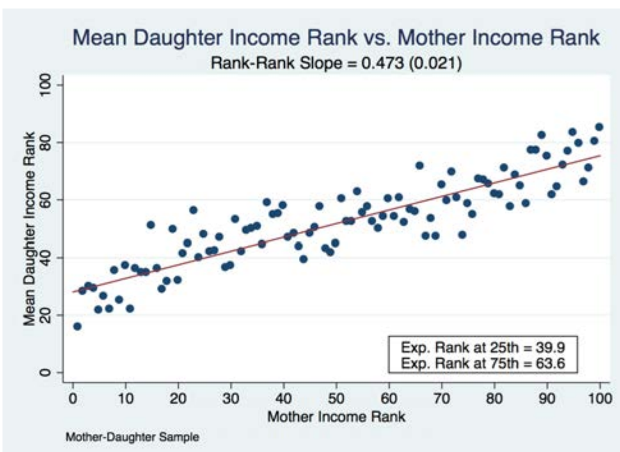
Figure A.5: Income rank mobility by parent-child samples



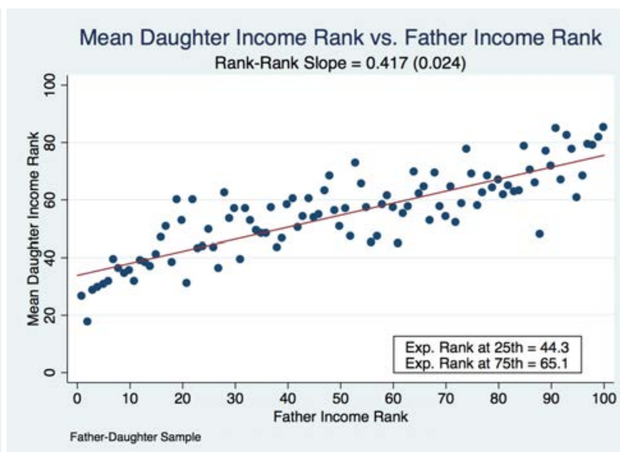

(a) Rank mobility for mothers and sons




(b) Rank mobility for fathers and sons



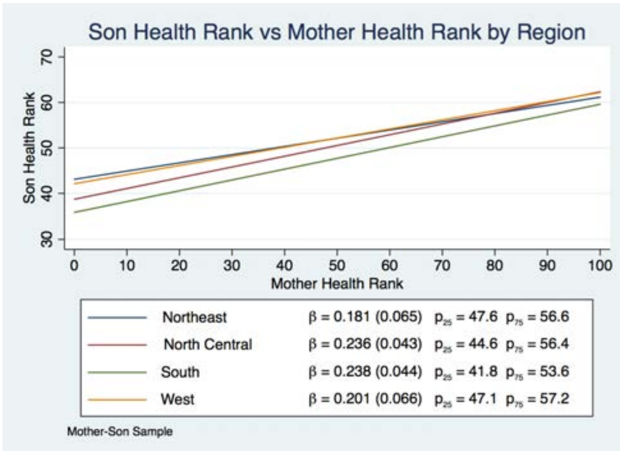

(c) Rank mobility for mothers and daughters



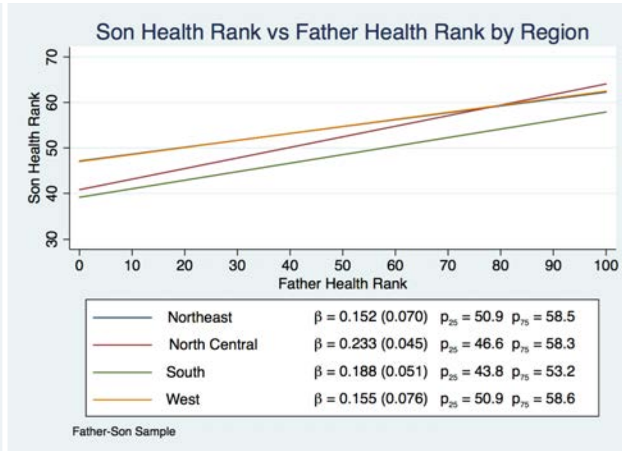

(d) Rank mobility for fathers and daughters

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.

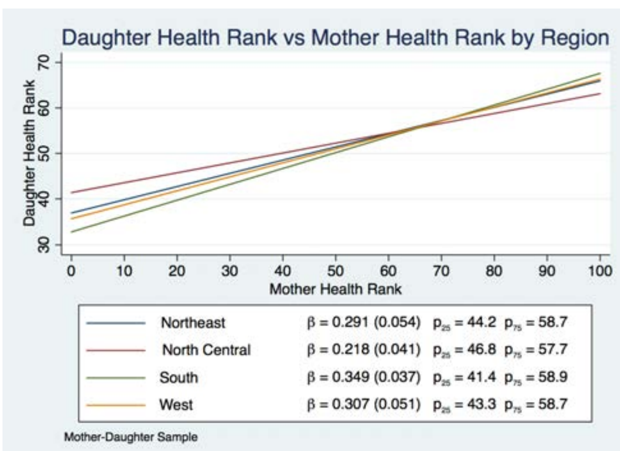
Figure A.6: Health rank mobility by childhood region



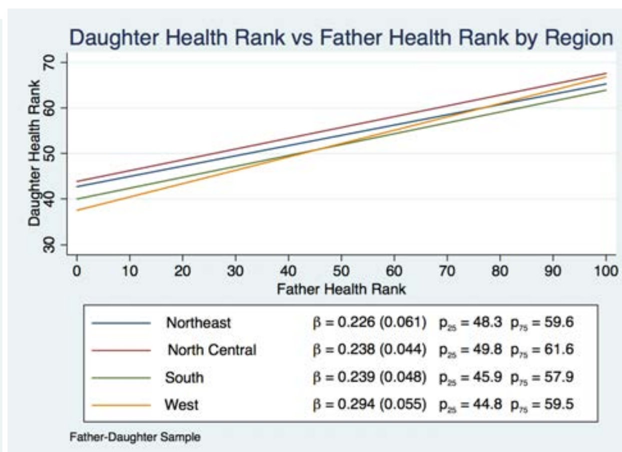

(a) Rank mobility by region for mothers and sons




(b) Rank mobility by region for fathers and sons



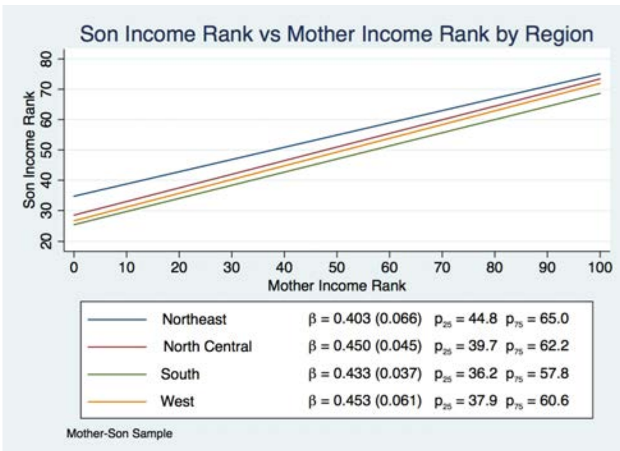

(c) Rank mobility by region for mothers and daughters



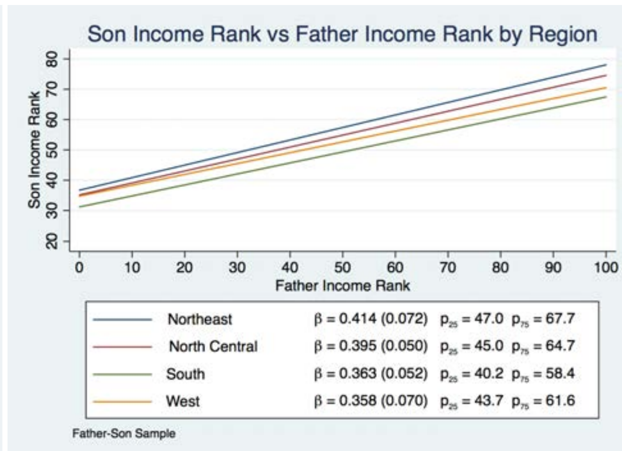

(d) Rank mobility by region for fathers and daughters

Figure A.6 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 $\beta$, 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.

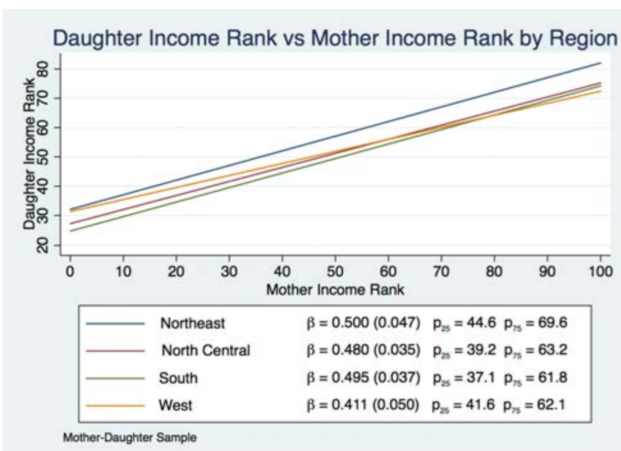
Figure A.7: Income rank mobility by childhood region



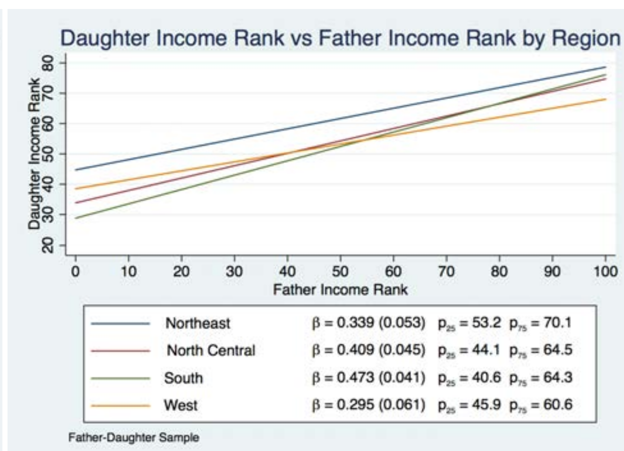

(a) Rank mobility by region for mothers and sons




(b) Rank mobility by region for fathers and sons



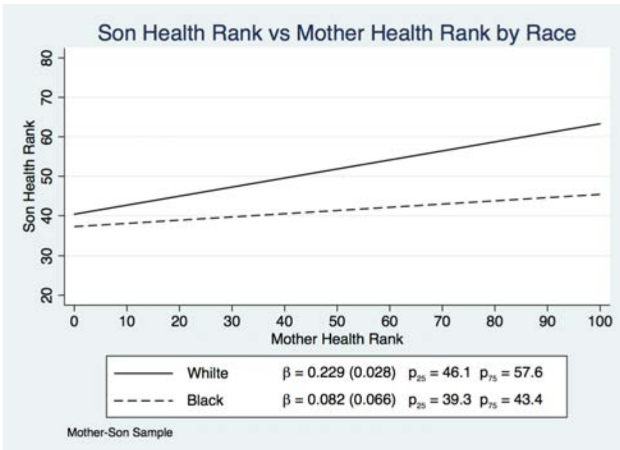

(c) Rank mobility by region for mothers and daughters



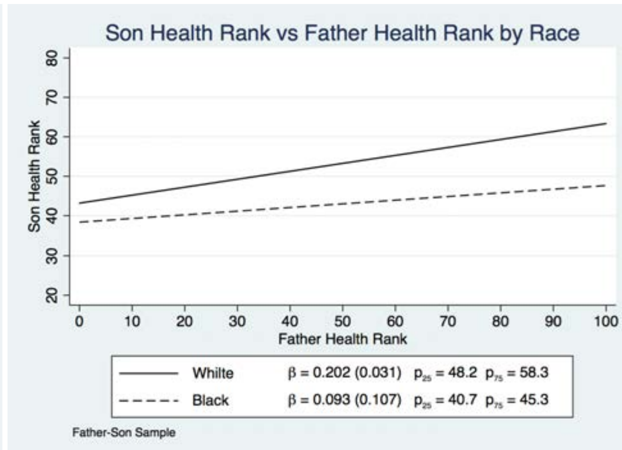

(d) Rank mobility by region for fathers and daughters

Figure A.7 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 $\beta$, 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.

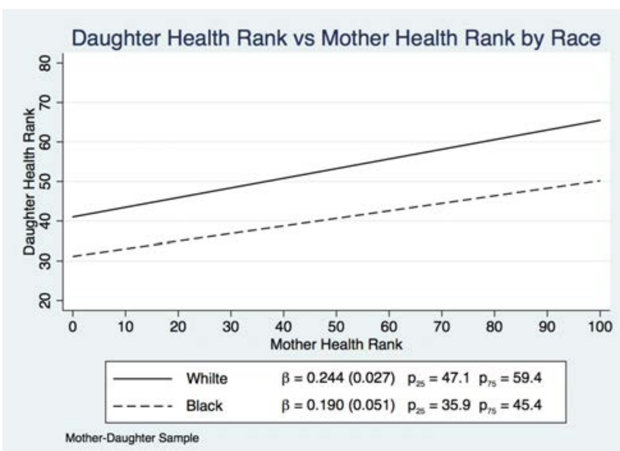
Figure A.8: Health rank mobility by race



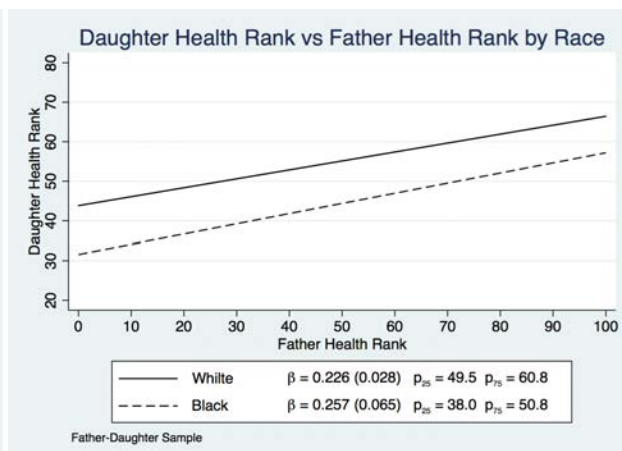

(a) Rank mobility by race for mothers and sons




(b) Rank mobility by race for fathers and sons



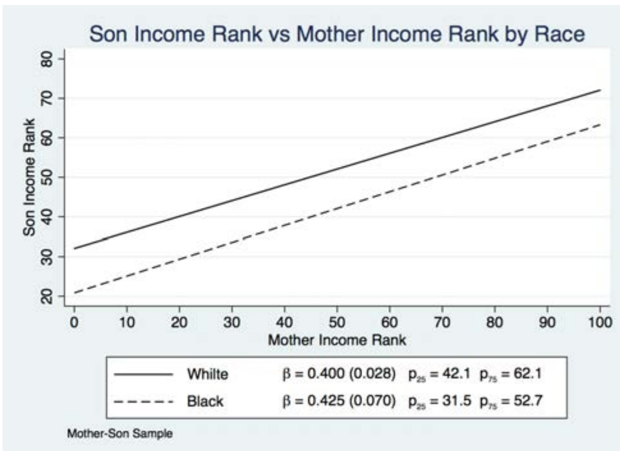

(c) Rank mobility by race for mothers and daughters



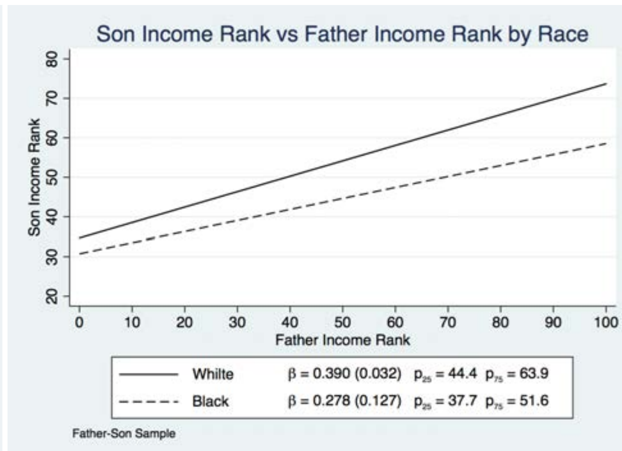

(d) Rank mobility by race for fathers and daughters

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 $\beta$, 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.

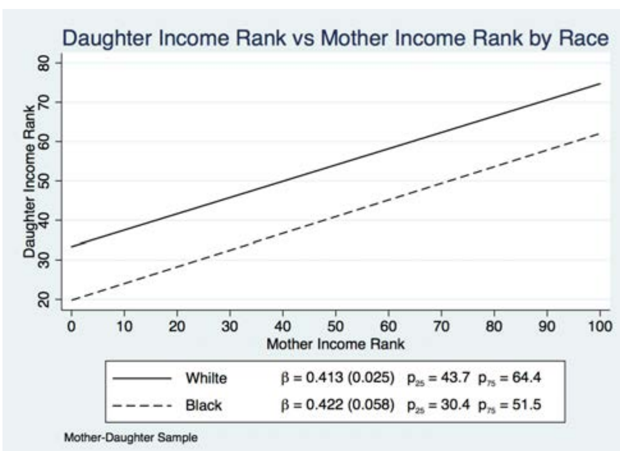
Figure A.9: Income rank mobility by race



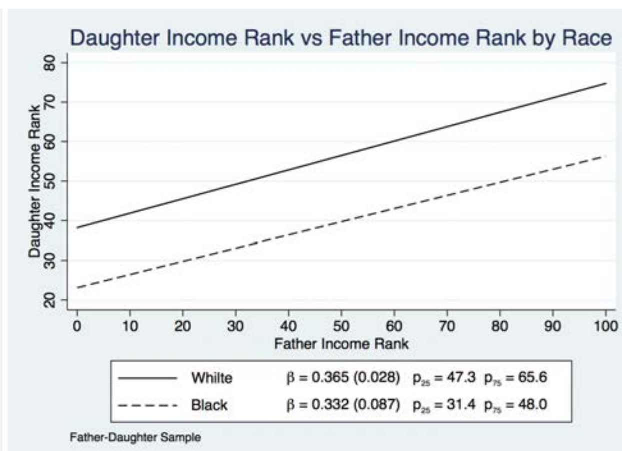

(a) Rank mobility by race for mothers and sons




(b) Rank mobility by race for fathers and sons



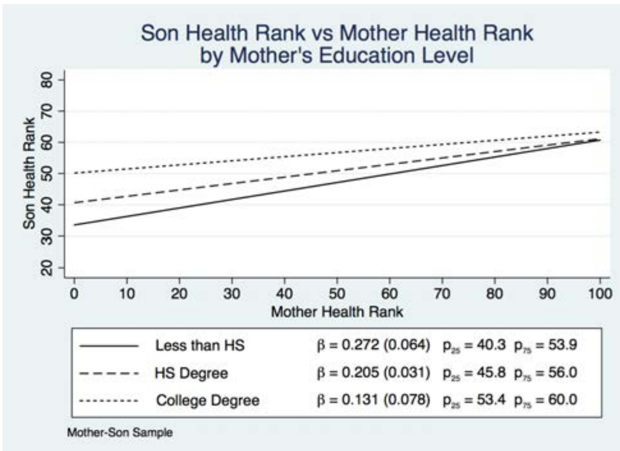

(c) Rank mobility by race for mothers and daughters



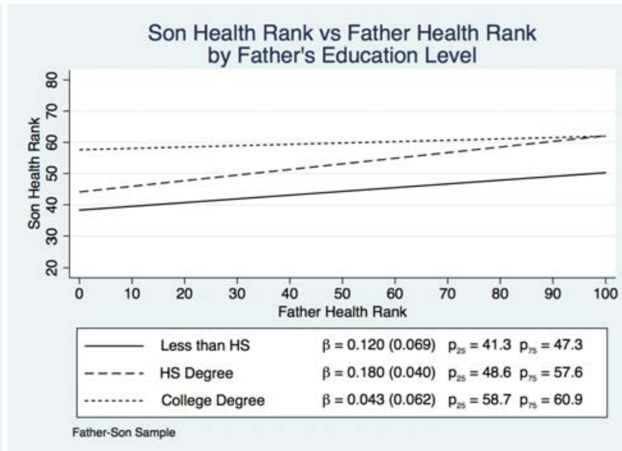

(d) Rank mobility by race for fathers and daughters

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 $\beta$, 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.

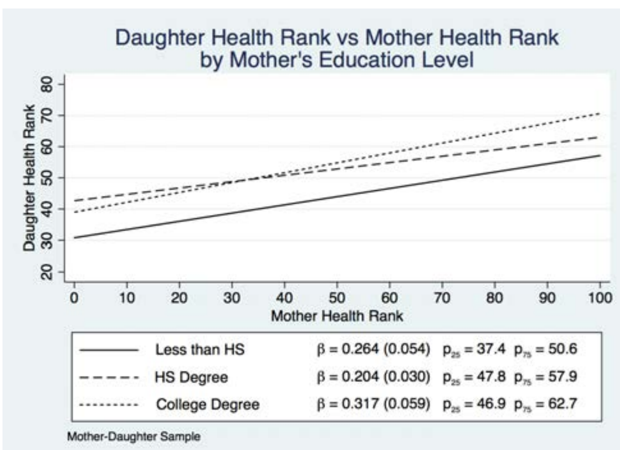
Figure A.10: Health rank mobility by parent's education level



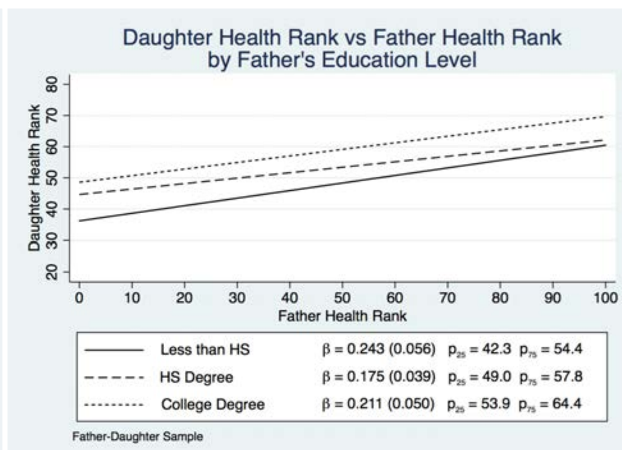

(a) Rank mobility by mother's education for mothers and sons




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



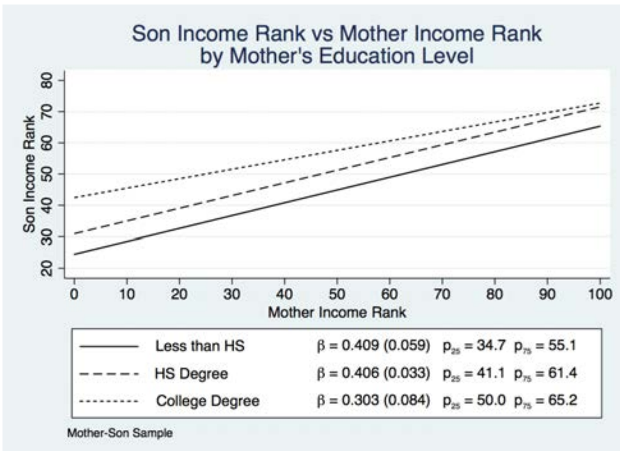

(c) Rank mobility by mother's education for mothers and daughters



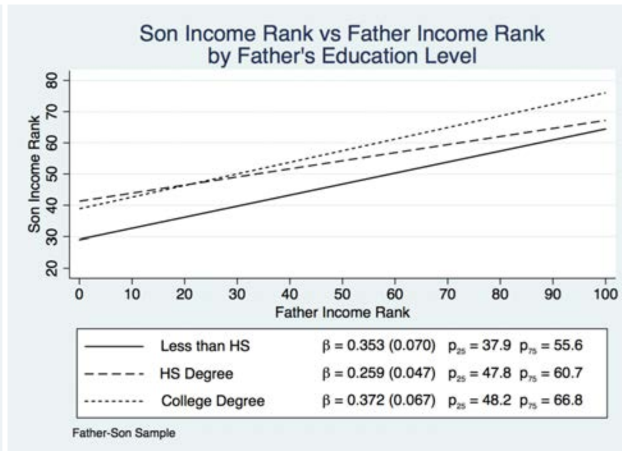

(d) Rank mobility by father's education for fathers and daughters

Figure A.10 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 $\beta$, 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.

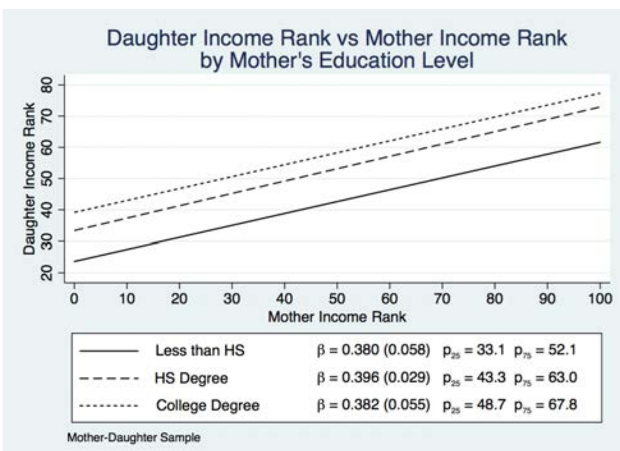
Figure A.11: Income rank mobility by parent's education level



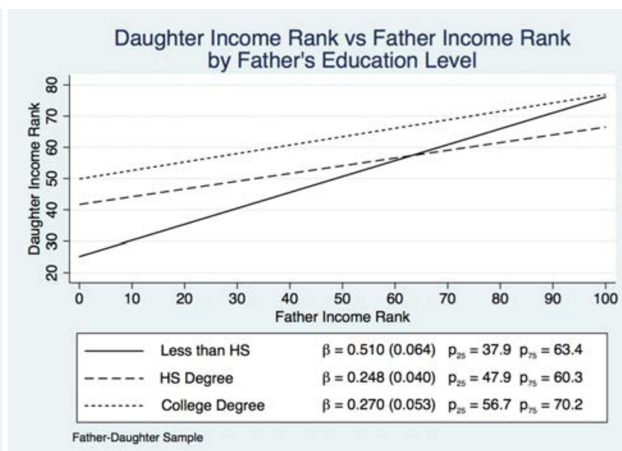

(a) Rank mobility by mother's education for mothers and sons




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



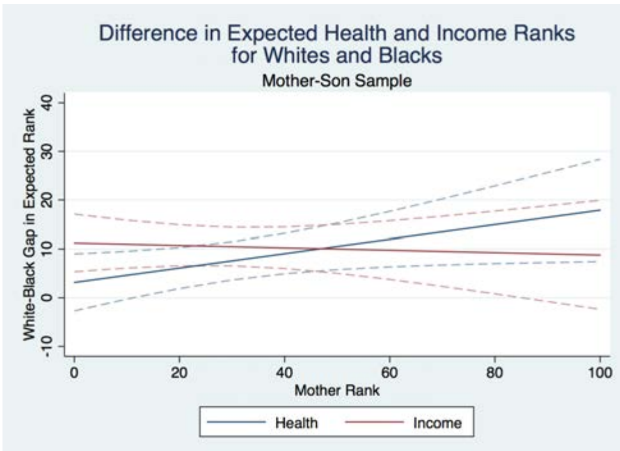

(c) Rank mobility by mother's education for mothers and daughters



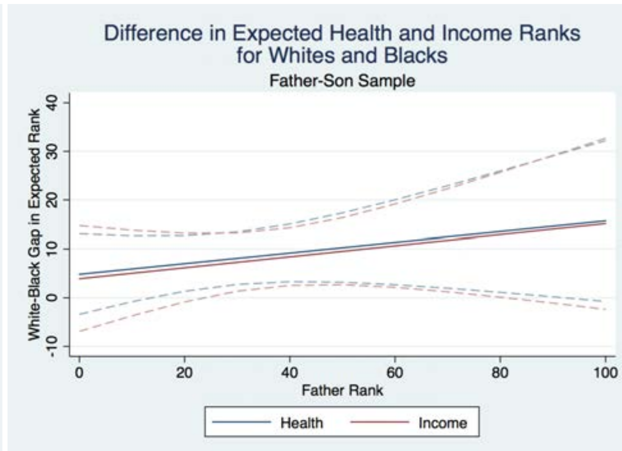

(d) Rank mobility by father's education for fathers and daughters

Figure A.11 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 $\beta$, 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.

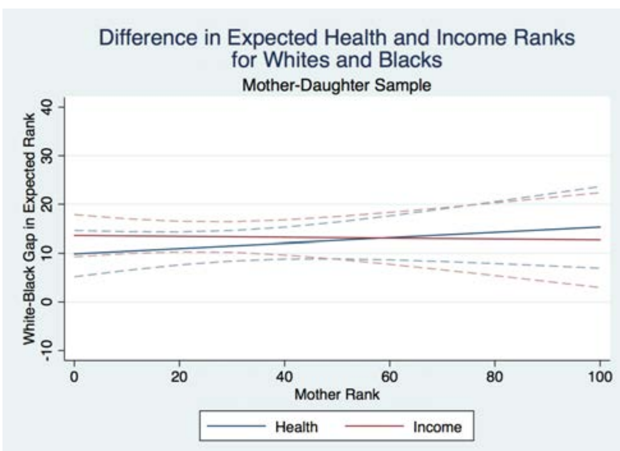
Figure A.12: Difference in health and income mobility between whites and blacks



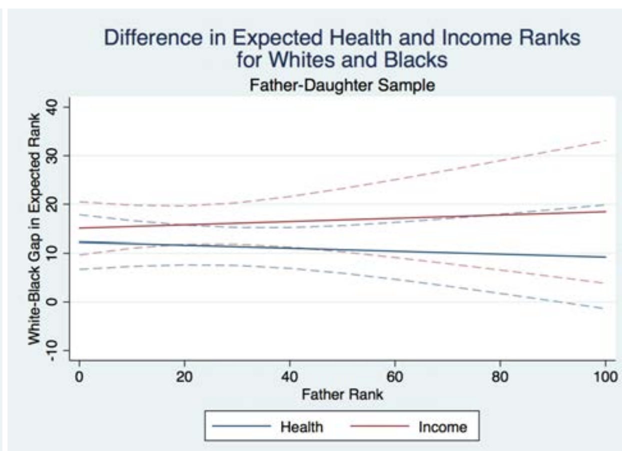

(a) Mothers and sons




(b) Fathers and sons




(c) Mothers and daughters




(d) Fathers and daughters

Figure A.12 plots the difference in expected rank between whites and blacks for health and income along the parent rank distribution. The predicted ranks are estimated 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. Health percentile ranks are constructed from the age-adjusted baseline health measure and are ranked separately by gender 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 by gender 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.

## Appendix Tables

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

| | All<br>(1) | Sons<br>(2) | Daughters<br>(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: Descriptive statistics of self-reported health status and alternative health index (1999-2013 sample)

| *A. Parents* | | |
|---|---|---|
| | Father<br>(1) | Mother<br>(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<br>(3) | Sons<br>(4) | Daughters<br>(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.2: 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.2 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.3: Robustness of health mobility estimates to varying parent and child age

| | | Mother's Health | | | | | Father's Health | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *A. Intergenerational Health Associations (All Children)* | | | | | | | | | | | |
| | | 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)** |
| | 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*** ** |
| Parent's Age | | (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.3: Robustness of health mobility estimates to varying parent and child age – Continued

| | | 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** |
| | | (11) | (12) | (13) | (14) | **(15)** | (16) | (17) | (18) | (19) | **(20)** |
| *B. Rank-Rank Slopes (Sons Only)* | | | | | | | | | | | |
| Parent's Age | 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*** ** |
| | | (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.3: Robustness of health mobility estimates to varying parent and child age – Continued

| | | Mother's Health | | | | | Father's Health | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *C. Rank-Rank Slopes (Daughters Only)* | | | | | | | | | | | |
| | | Child's Age | | | | | Child's Age | | | | |
| | | 30-39 (21) | 40-49 (22) | 50-59 (23) | 60-69 (24) | **All ages (25)** | 30-39 (26) | 40-49 (27) | 50-59 (28) | 60-69 (29) | **All ages (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.3 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.4: Correlation in health and income mobility by parent-child samples

| | Mother-Son<br>(1) | Father-Son<br>(2) | Mother-Daughter<br>(3) | Father-Daughter<br>(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.4 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.5: Health rank mobility by region, race, 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) |
| *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 |
| *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 |
| *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.5: Health rank mobility by region, race, 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) |
| *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 |
| *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 |
| *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.5 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.6: 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.6 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.7: 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.7 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.8: Upward and downward health mobility by region, race, 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% |
| *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% |
| *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% |
| *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 region, race, 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% |
| *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% |
| *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% |
| *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: Income rank mobility by region, race, 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) |
| *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 |
| *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 |
| *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.9: Income rank mobility by region, race, 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) |
| *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 |
| *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 |
| *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.9 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.10: Upward and downward income mobility by region, race, 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% |
| *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% |
| *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% |
| *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.10: Upward and downward income mobility by region, race, 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% |
| *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% |
| *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% |
| *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.10 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.