Revisiting the Role of Personality in the Education-Health Gradient

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Abstract

We revisit the question of how socio-emotional skills contribute to the educationhealth-gradient. We use an extraordinarily large and representative survey (N=39,000)with high-quality measures of socio-emotional skills that is linked to individual-level information on SES background, family linkages and detailed health outcomes from high-quality administrative registers. We contribute to the debate on the education gradient in health in two ways: First, we document the gradient over a wide range of objective diagnoses and health measures from registers as well as survey data on subjective health status and health behaviors. We also use detailed information on socio-emotional skills including not only the usual (short) Big-Five inventories, but also Big-Five personality *facets*, locus of control, and risk preferences, providing us with a much more fine-grained image of each individuals' human capital in this domain. We show that having access to facet-level personality traits greatly reduces the gradient beyond what standard Big-Five measures of personality traits achieve. In most health outcomes, personality reduces the gradient by 20-30%. There is no independent reduction in the gradient from including economic preferences (risk and patience). Interestingly, we observe that there is a remaining role for income, even after controlling for personality and preferences. Secondly, we address head-on the difficulty that much of the observed relationships between education and health are associations rather than causal relationships. To the extent that genetic endowments and childhood environment are shared by siblings, we can control for their role by exploiting data on siblings. Using sibling-fixed effects, we find that there are education gradients in most health outcomes even within sibling pairs; these gradients are still reduced by 13-40% from the inclusion of personality traits.

JEL Classification: I14, I12, I24, I31

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1 Introduction

More educated individuals live longer and healthier lives (Galama et al., 2018; Lleras-Muney, 2005; Lleras-Muney and Lichtenberg, 2014). Numerous studies have shown associations between education and mortality, (self-reported) health, obesity, and health behaviors such as smoking, excessive drinking, exercise, and preventive care use (for example, see Savelyev, 2020). This inequality of health along the education spectrum, called the *education-health gradient*, has been found in many countries and time periods, and it may be increasing over time (Case and Deaton, 2017; Chetty et al., 2016; Kreiner et al., 2018; Meara et al., 2008; Pappas et al., 1993; Silles, 2009). Education is used as a stand-in for general socio-economic status (SES), and may even capture more inequality than other SES measures. Education predicts the onset of disease, whereas in-come and wealth do not—once education is controlled for (Smith, 2004). It is disputed in the literature whether education causally determines health, or whether it rather picks up other unobserved factors. Lundborg et al. (2016), for example, attribute a great role to formal schooling based on twin studies, whereas (Lleras-Muney, 2022) summarizes the literature on policy-driven changes in education (from compulsory-schooling laws) as mixed: there are some positive effects, particularly for older cohorts and men, but many studies with precisely estimated zero effects. A primary candidate for unobserved factors that underly the positive associations observed are cognitive and socio-emotional skills. While Cutler and Lleras-Muney (2010) doubted their explanatory potential, Conti and Hansman (2013) and more recently Savelyev (2020) demonstrate the opposite. For policy, it is very important to understand whether the gradient is really picking up effects of education, or rather of other skills that are simply correlated with education.

In this paper, we revisit the question of how socio-emotional skills contribute to the education-health-gradient. We use an extraordinarily large and representative survey (N=39,000) with high-quality measures of socio-emotional skills that is linked to individual-level information on SES background, family linkages and detailed health outcomes from high-quality administrative registers.

We contribute to this debate in two ways: First, drawing on our linked surveyregister data, we provide a rigorous and detailed documentation of the education-health gradient. Using a wide range of objective diagnoses and health measures from registers as well as survey data on subjective health, mental health, and health behavior, not just simple overview measures of general health, or the catch-all longevity, we are able to significantly improve on existing studies. Our measures of socio-emotional skills are more detailed than the usual (short) Big-Five inventories that are used. We have access to Big Five personality *facets* and locus of control, providing us with a much more fine-grained image of each individuals' human capital in this domain.

We use this rich linked data to document how the education gradient in objective as well as subjective health outcomes and health behaviors is reduced by including a full battery of detailed socio-emotional skills. We show that having access to facet-level personality traits greatly reduces the gradient beyond what standard Big-Five measures of personality traits achieve. In most health outcomes, personality reduces the gradient by 20-30%. We therefore conclude, in contrast to Cutler and Lleras-Muney (2010), that socio-emotional skills *do matter* for the education-health gradient. There is no independent reduction in the gradient from including economic preferences (risk and patience). Interestingly, we observe that there is a remaining role for income, even after controlling for personality and preferences, contrary to Smith (2004).

Secondly, we address head-on the difficulty that much of the observed relationships between education and health are associations.¹ To arrive at causal inferences is as desirable as it is problematic, because the associations may be driven by unobserved initial conditions determining both how many years of schooling an individual obtains and their adult health. Examples of such common factors are genetic endowments, childhood environment, childhood health and cognitive ability, and to the extent that they are not controlled for, the associations may overstate the true causal impact of education on health. We address the role of genetic endowments and childhood environment that are shared by siblings by exploiting a sibling-fixed effects set-up. This is feasible in our large survey, where siblings were over-sampled, resulting in over 19,000 respondents from sibling pairs. We find that there are education gradients in most health outcomes even within sibling pairs; these gradients are still reduced by 14-40% from the inclusion of personality traits.

Our paper thus extends the current knowledge in several important dimensions. Our unique data allows us to explore the health-education gradient across a wide array of

¹Scholars still debate to what extent these associations withstand the test of causality (for the most recent example, see Lleras-Muney, 2022).

health dimensions and health behaviors. We show that the SES gradient varies in size depending on the health outcome studied. Moreover, consistently with Lleras-Muney (2022), we document that there is considerable heterogeneity in the education gradient, which varies over age and gender. We explore trends in health and health behaviors over the lifecycle, showing that while the education gradient is more pronounced as people age for some health outcomes (e.g. the Charlson comorbidity index), the divergence in health outcomes is more striking in other health dimensions (e.g. poor self-reported health, BMI and some health behaviors). A particularly valuable feature of our data is the availability of detailed facets that make up the Big 5 personality traits. This allows us to pinpoint more accurately the roots of inequalities in health than what has been done in previous studies.

2 Data Description

The data for this project stems from a tailor-made online survey for which we invited a random sample of 121,390 individuals in Denmark. The survey provides information on self-assessed health and health behaviors, as well as detailed facet-level personality traits (details in Section 2.1). We merge the survey to information from high-quality administrative registers to assess objective health markers via diagnoses and health care use (Section 2.2). The registers also identify family members, which is used to construct a sample of siblings (Section 2.3).

2.1 Survey Data

Survey Collection Statistics Denmark provided us with a random sample of individuals in Denmark in 2019, approximately representative of each cohort from 1944-2001. For the cohorts of 1956-1998, we also identified the siblings of all non-singleton individuals (more details on the sibling sample in the subsection below). The sample of 121,390 individuals aged 18 and older, living in Denmark, was then contacted in May and August 2019 via a secure messaging system² which is linked to everyone's social security number and which is exclusively used for official communication (including pay slips etc.). Every secure letter contained an invitation to participate, which explained briefly the purpose of the study, and that there would be a lottery among all respondents with 200

²This system is called "e-Boks"—see https://www.e-boks.com/danmark/en/what-is-e-boks/.

prizes of 1,000 Danish Crowns each (approximately 130 Euro). The letter also contained information on privacy, such as GDPR laws being observed by our study. After 10 days, all non-respondents were sent reminders (79%), as were partial responders (1.4%, with a different text acknowledging their partial response). The response rate including partial responses was 33.7% (N=41,373); 30% for complete responses. We can use information from the registers to predict survey response, because the register information is available independently of survey response. Response rates were somewhat higher for individuals with one sibling relative to singletons, and for those for which we do not have information on sibling status (more details below)—see Table S.5. Responses are increasing in age (but also very high for those below the age of 20), education, somewhat increasing in income, and somewhat decreasing in health (although individuals with much longer hospitalizations have a greater propensity to respond). Women are more likely to respond, and immigrants and their descendants are less likely to do so. These patterns hold across different family types (number of siblings) and gender.

Survey Design The survey assessed health behaviors, economic preferences and beliefs about the health production function, satisfaction with the public health system, and human capital in the form of socio-emotional skills and cognitive functioning. The survey was implemented in multiple versions, so that 2 participants could have responded to different sets of questions. This was done in order to achieve maximum coverage of the broad range of sub-topics while not straining participants too much. The survey versions were designed to be overlapping, and there was a core set of questions in all versions: self-assessed health, health behaviors, a personality inventory, economic preferences, a mental health instrument and a proxy for cognitive skills (details on all below). The total length was between 97-134 items. There was no differential drop-out from the longer versions in comparison to shorter ones.

Personality Inventory The largest component of the survey was the Big Five personality inventory. We used the **BFI-2**, of which we implemented both the full 60-item version (Soto and John, 2017a) and an abbreviated 30-item instrument (Soto and John, 2017b) for different groups. See the full list of items in Tables S.1 and S.2. These instruments hierarchically assess the traits of Openness to Experience (called Open-Mindedness by the authors of the BFI-2), Conscientiousness, Extraversion, Agreeableness, and Emotional Stability (Negative Emotionality), together with three sub-facets for each of these traits: Open-Mindedness facets of Intellectual Curiosity, Aesthetic Sensitivity, and Creative Imagination; Conscientiousness facets of Organization, Productiveness, and Responsibility; Extraversion facets of Sociability, Assertiveness, and Energy Level; Agreeableness facets of Compassion, Respectfulness, and Trust; and Negative Emotionality facets of Anxiety, Depression, and Emotional Volatility. The BFI-2 has a reasonably short response time, with repeated statements to agree/disagree with (for example, I am someone who ... "Is outgoing, sociable" or "Can be somewhat careless"). The availability of sub-facets addresses the bandwidth-fidelity tradeoff, in that broadly defined traits tend to predict a wider range of criteria, whereas narrowly defined traits tend to predict closely aligned criteria more accurately. Facets from a hierarchical model are not typically available in economics research, as surveys are kept too short to be able to break down traits. Another advantage from administering a longer instrument is that it can prevent the measurement problem of acquiescent responding, the tendency of some individuals to consistently agree (yea-saying) or disagree (nay-saying) with items regardless of their content. The BFI-2 contains an equal number of truekeyed and false-keyed items, in both the long and abbreviated form. The reliability is high. For the short version, for example, the alpha reliabilities are reported to have a range of 0.81 to 0.90 across samples in Soto and John (2017b).

The analyses presented here use the short version from all respondents (because the short version contains a sub-set of the items in the long version, it is easy to construct the short version for respondents to the long instrument)—this maximizes the number of observations. Since this survey was administered in Denmark, we used the Danish translation suggested and validated by Vedel et al. (2021).

In addition to this personality inventory, we measured participants' Locus of Control, following the items used in the Australian HILDA (Cobb-Clark and Schurer, 2013, also see Caliendo et al., 2015; Cobb-Clark et al., 2014). We construct an index for "internal locus of control," which describes the extent to which individuals believe that their life's outcomes are due to their own efforts, rather than to external factors (e.g. luck). Similarly to the BFI-2 measures, respondents should agree/disagree on seven statements such as "I have little control over the things that happen to me." or "What happens to me in the future mostly depends on me." – see the full list of items in Table S.3. **Economic Preferences** were assessed with two questions: "Overall, how willing or unwilling are you to run a risk?" to measure risk preference, and "How willing are you to give up something that is beneficial to you today to benefit from it in the future?" Answers are on a scale from 1 (completely unwilling) to 10 (very willing). These items were validated experimentally with incentivized-choice experiments, where these items exhibited the highest predictive power (see details in Falk et al., 2016 or the summary in Falk et al. (2018)). These short survey questions are good predictors of behaviors (Bonin et al., 2007; Dohmen and Falk, 2011; Jaeger et al., 2010) and have been widely used (for example Dohmen et al., 2010) and are part of the well-known German Socio-economic panel. We also assessed life satisfaction with a Cantrill-ladder-type question: "All things considered, how satisfied are you with your life as a whole these days? On the scale that ranges from 'completely dissatisfied' to 'completely satisfied,' where would you put your satisfaction with life as a whole?"

Self-assessed Health is measured with 4 questions given to all respondents: First, as an overall rating, we use "Would you say your health is... (excellent to bad)." We code an answer as less than "good" as **bad self-reported health**. A second measure asks "For the past six months at least, to what extent have you been limited because of your health in activities people usually do? Think of grocery shopping, domestic work such as vacuuming, or climbing stairs." The third measure is BMI, computed from answers on weight and height. We generate an indicator for having a **BMI greater than 30**, the usual cutoff for obesity. In all questions, we follow the wording in SHARE data.

Mental Health measures are obtained from the MHI-5 (a Danish translation of Berwick et al., 1991). This five-question screening detects mental illness (including depression, anxiety, affective disorders) exceptionally well. It performs comparable to longer instruments, such as the 18-item MHI, the 30-item version of the General Health Questionnaire (Berwick et al., 1991), and the longer Mental Health Component Summary, as Rivera-Riquelme et al. (2019) write. It detects mental health problems, based on questions such as "How much of the time, during the past month, have you felt so down in the dumps that nothing could cheer you up?" or "How much of the time, during the past month, have you felt calm and peaceful?" (full list of items in Table S.4). A higher score means greater difficulties. The MHI-5 scale is positively correlated with Neuroticism in our survey, especially the facet of Depression (r=.67).

Health behaviors cover several areas, ranging from general ("Do you do anything to preserve or improve your health?") to specific questions to smoking, drinking, diet and exercise. We code behaviors such that they indicate harmful behavior, similar to illness outcomes in the register data of diagnoses described below. Little physical activity indicates less than 3 days per week with moderate or vigorous physical activity. We define a Bad Diet as disagreeing partially/entirely on "Do you follow a health-conscious diet?". A Heavy drinker is defined via binge-drinking as responding "more than once a month" or more frequently on "In a regular month, on how many days do you have 5 drinks or more?". We also use the answer to "How many 'alcohol units' do you normally drink per week?"³ as a continuous outcome. We code Frequent drinking from "During the last six months, how often have you drunk any alcoholic beverages, like beer, cider, wine, spirits or cocktails?" as three or more days per week. Smoking is measured with "Are you currently smoking?". We also ask "How many hours of sleep do you usually get per night?" and code an indicator for less than 7 hours as little sleep.

2.2 Administrative Register Data

The completed survey data was anonymized and merged to the administrative registers, through the unique personal identifier for all individuals in Denmark, on a secure server by Statistics Denmark. This link is essential to construct the gradient by education (obtained from registers), with objective measures of health and health care use at the individual level.

The combination of survey and administrative register data makes several contributions possible. First, the register data allows us to link respondents to their parents through the 2019-population register: this lets us construct a sample of siblings. Secondly, we observe detailed diagnoses, and can therefore measure health outcomes in an objective and nuanced way whereas much of other research is limited to longevity as the final measure of health, or self-reported general health. Thirdly, we are able to compare the socioeconomic background of individuals who completed the questionnaire with that

³Alcohol units is a concept adult Danes are well acquainted with, and is not something abstract to the regular person. Nevertheless, we provided respondents with additional information in a box, giving examples of units, such as 1 bottle of lager = 1 unit, 1 glass of red/white wine = 1 unit, 1 shot = 1 unit, 1 bottle of liquor of 75 cl. = 25 units etc.

of the entire sample of randomly selected potential respondents. This allows us to assess potential biases in responses due to non-random selection into answering the survey.

While we use **years of education** for the gradient regressions below, we also begin with descriptive graphs where we divide the sample into three **education groups**, based on the highest observed schooling in the registers up to 2018. "Low" education covers lower secondary education which corresponds to compulsory schooling. 23% of the population are in this category. "Middle" education ranges from higher secondary to lower tertiary education (42% and 5%, combined 47%). Examples of short tertiary courses are police officer, laboratory worker, financial economist, multimedia designer. Finally, "high" education corresponds to a university degree, including Bachelor, Master, Doctoral and equivalent degrees (18%, 10% and 0.7%, a total of 30% of the population). The latest update to this register is from 2019.

Health outcomes rely on two register sources. First, we use the "Landspatientregister" which provides diagnoses given by doctors in hospitals, from 1998-2018. We use a crosswalk provided by Statistics Denmark to convert all diagnoses into ICD-10 codes. From these, we generate a **count of diseases**: a count of all different codes in one year, 2018. From this count, we exclude the codes related to preventive care, screening, and pregnancy- or birth-related visits. The same register also provides a count of **nights hospitalized**, associated with each diagnosis. We collapse the count across diagnoses in 2018. We further use this register to create a Charlson Comorbidity Index. This index (Charlson et al., 1987) predicts 1-year mortality on the basis of pre-existing conditions on 19 comorbid conditions,⁴ in a weighted index. Since we only measure diagnoses when they occur, and not whether someone has a condition, we collapse any diagnosis of these 13 illnesses in the past 20 years (1999-2018). Next, we use information on the number of contacts with the General Practitioner (GP), and create a variable that sums up the **number of doctor visits** in 2018.

Other covariates used are from the registers and are rather straightforward, such as gender. Our income measure is constructed by Statistics Denmark to assess disposable

⁴The comorbid conditions are myocardial infarct, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic pulmonary disease, connective tissue disease, ulcer disease, mild liver disease, diabetes (weights of 1), hemiplegia, moderate/severe renal disease, diabetes with end organ damage, any tumor, leukemia, lymphoma (weights of 2), moderate/severe liver disease (weight of 3), metastatic solid tumor, AIDS/HIV (weights of 6).

income in the latest observed year, 2016. It contains both labor income and income transfers. Labor income includes salary income and income for self-employed. Income transfers include unemployment benefits, disability pension, pensions etc.

The final sample consists of all individuals who completed the BFI-2 instrument, and who are between ages 25-75 in 2019. This ensures that educational attainment is completed and we do not include spurious association between health and education among the youngest.

2.3 Sibling Sample

To identify siblings, we use all population registers from 1986-2019, and denominate all persons as siblings who were registered as having the same mother (biological or adoptive). Note that we can only identify siblings in the civil registration system when they are currently living in Denmark and have information on their biological mother.⁵ The population registers are available from 1986. Therefore, the oldest participants in our study will not have information on their parents, as a fair share of them had already passed away by then and were not registered posthumously. This makes it impossible to identify siblings of older generations via the registers, since their biological mother is unkown. Gensowski et al. (2021) show that the proportion of respondents in each 5-year age group for which the register data contains a parent identifier is above 90% for respondents younger than sixty (see their Table 1). We nevertheless end up with a significant proportion of respondents for whom no sibling information is available. From the subset of respondents with at least one sibling (N=25,412), we received responses from two or more siblings within the same family from 5,839 individuals. The respondents' personality traits and facets are summarized in Table 1, by sibling status.

About half of individual differences in personality traits is considered heritable (Bouchard and Loehlin, 2001; Krueger et al., 2008; Tellegen et al., 1988; Yamagata et al., 2006). Heritability may however decrease across the life span, as recent studies have reported (Kandler et al., 2020). Therefore, one might reasonably concerned whether there is

⁵For most individuals, the number of siblings is consistent across years once the mothers are beyond child-bearing age. Yet the population register does not list Danes (or previous residents) living abroad. Therefore, some individuals have more siblings in one year than later. For individuals who at any point are of a higher birthorder than the number of siblings listed earlier, we replace their number of siblings as the maximum birthorder.

meaningful variation in personality traits among siblings. To test this, we compute the gap in personality traits among siblings.

In Table 2, we show the variances among siblings (for this exercise, we randomly selected two siblings in families with three or more valid BFI responses.) We are interested in contrasting the distributions of personality traits within families to what one would observe from comparing two random strangers in the population. Therefore, we also list the same statistic for a pair of placebo-siblings (two random strangers from the sibling sample). While the variances and distributions are statistically significantly different from each other (see the p-values for test of equal variances, assuming normality), it is evident that there is almost as much variation within families as across. We therefore consider within-family personality differences to be a meaningful and promising source of variation in personality.

Table 1: Descriptive Statistics:	Personality by Sibship Size
1	

		Mean	and Std.Dev.		Regression Coefficients			
	(1) Singleton Mean/Std.Dev	(2) One Sib Mean/Std.Dev	$(3) \\ 2+ \text{Sibs} \\ Mean/Std.Dev$	(4) No Info Mean/Std.Dev	(5) Reg One Sib	$\begin{array}{c} (6) \\ \text{Reg } 2+ \text{ Sibs} \end{array}$	(7) Reg No Info	
Openness	3.505	3.462	3.434	3.481	-0.019	-0.036^{**}	-0.052^{***}	
	0.697	0.692	0.676	0.669	0.016	0.015	0.018	
Conscientiousness	3.844	3.824	3.837	3.981	0.037^{**}	0.016	0.020	
	0.694	0.684	0.669	0.629	0.015	0.014	0.017	
Extraversion	3.501	3.533	3.510	3.548	0.053^{***}	0.023	0.002	
	0.716	0.717	0.717	0.658	0.016	0.015	0.018	
Agreeableness	3.933	3.944	3.975	3.995	0.030^{**}	0.054^{***}	0.014	
	0.640	0.638	0.632	0.616	0.014	0.013	0.016	
Neuroticism	2.586	2.618	2.580	2.439	-0.027	-0.038^{**}	-0.031	
	0.820	0.832	0.820	0.733	0.018	0.017	0.020	
Openness, Intellectual Curiosity	3.787	3.819	3.777	3.661	-0.012	-0.032^{*}	-0.051^{**}	
· · · ·	0.803	0.773	0.781	0.807	0.018	0.018	0.021	
Openness, Aesthetic Sensitivity	3.181	3.080	3.036	3.216	-0.042^{*}	-0.071^{***}	-0.053^{**}	
	1.025	1.010	0.998	0.975	0.023	0.022	0.026	
Openness, Creative Imagination	3.546	3.485	3.491	3.565	-0.007	-0.011	-0.053^{**}	
, , , , , , , , , , , , , , , , , , ,	0.971	0.960	0.953	0.933	0.022	0.021	0.025	
Conscientiousness, Organization	3.587	3.547	3.542	3.776	0.034	-0.019	0.020	
	1.041	1.044	1.016	0.926	0.023	0.022	0.026	
Conscientiousness, Productiveness	3.840	3.822	3.875	3.981	0.042**	0.058***	0.032	
	0.867	0.857	0.842	0.793	0.019	0.018	0.021	
Conscientiousness, Responsibility	4.106	4.102	4.094	4.187	0.036**	0.010	0.015	
concerence achieved, receptioners	0.734	0.692	0.707	0.721	0.016	0.016	0.018	
Extraversion Sociability	3.446	3.496	3.449	3.452	0.044*	-0.005	-0.011	
	1.057	1 032	1 029	0.955	0.023	0.023	0.026	
Extraversion Assertiveness	3 559	3 544	3 528	3 557	0.023	0.000	-0.048**	
Extraversion, Assertiveness	0.874	0.890	0.801	0.859	0.022	0.000	0.043	
Extravorsion Energy Lovel	3 407	3 561	2 552	3 634	0.020	0.076***	0.025	
Extraversion, Energy Lever	0.030	0.012	0.024	0.805	0.094	0.070	0.007	
Agroophlanges Composition	0.939	0.912	4.072	4.005	0.021	0.020	0.024	
Agreeableness, Compassion	4.043	4.047	4.072	4.055	0.025	0.040	0.004	
Agroephlaness Despectfulness	4 242	0.853	0.030	4.268	0.013	0.017	0.020	
Agreeableness, Respectiumess	4.242	4.205	4.213	4.208	0.014	0.017	0.007	
Agroephloness Trust	0.700	0.749	0.749	2.691	0.017	0.017	0.019	
Agreeableness, 1rust	0.012	0.019	0.000	5.021	0.047	0.090	0.029	
N	0.812	0.818	0.822	0.794	0.019	0.018	0.021	
Neuroticism, Anxiety	2.922	2.968	2.940	2.815	-0.015	-0.019	-0.012	
N C D C	0.955	0.964	0.952	0.905	0.021	0.020	0.024	
Neuroticism, Depression	2.224	2.272	2.240	2.047	-0.029	-0.021	-0.004	
NT (*** T) (*****************************	1.019	1.029	1.023	0.924	0.022	0.021	0.025	
Neuroticism, Emotional Volatility	2.611	2.613	2.561	2.455	-0.041^{*}	-0.078***	-0.080***	
	1.025	1.007	1.003	0.932	0.022	0.022	0.025	
Observations	2812	11671	16999	7317	33152	33152	33152	

Note: Columns 1-4 show simple means and standard deviations for the full survey sample, by sibship status. Columns 5-7 show coefficients on an

indicator of sibship status relative to the baseline of no sibling.

3 Results

Before analyzing how much of the education-health gradient is accounted for by differences in personality traits, we establish the gradient in terms of multiple health outcomes.

3.1 What is the education-health gradient in Denmark today?

We begin by using the detailed medical diagnoses from the hospital data to establish the extent of the association between medical diagnoses and education. Take the first example in Fig. 1, which plots simply the average probability of being diagnosed with lung cancer by highest completed education. This is a naive association because it uses the entire cross-section, everyone ages 18-80 in the registers. Yet we know that educational attainment varies significantly by cohort. Figure 1 could therefore confound educational attainment with age—lower attainment for the oldest cohorts, which are also more susceptible to illness.

Figure 1: Naive Gradient: Malignant Tumors of the Trachea, Bronchi, or Lungs



Therefore, we proceed to document probabilities of individual diagnoses by education and age in Fig. 2. They plot non-parametric associations, from kernel-weighted local polynomial regressions of the probability of diagnosis on age, by education groups (with associated 95% confidence bands). We highlight a selected group of diagnosis codes that stand in for generally observed patterns. Many illnesses have an increasing baseline probability of being diagnosed with age (older individuals more likely to be ill), and where an education gap opens up at mid-age and widens until age 75, while possibly

	(1)	(2)	(3)
	Siblings sd	Placebo sd	p-value
Openness	0.864	0.777	0.000
Conscientiousness	0.857	0.901	0.000
Extraversion	0.911	0.764	0.000
Agreeableness	0.823	0.948	0.000
Neuroticism	1.057	1.154	0.000
Openness, Intellectual Curiosity	1.030	1.011	0.000
Openness, Aesthetic Sensitivity	1.308	1.109	0.000
Openness, Creative Imagination	1.237	1.161	0.000
Conscientiousness, Organization	1.324	1.257	0.000
Conscientiousness, Productiveness	1.086	1.307	0.000
Conscientiousness, Responsibility	0.950	0.834	0.000
Extraversion, Sociability	1.334	0.961	0.000
Extraversion, Assertiveness	1.171	1.083	0.000
Extraversion, Energy Level	1.206	0.930	0.000
Agreeableness, Compassion	1.102	1.197	0.013
Agreeableness, Respectfulness	1.010	1.160	0.000
Agreeableness, Trust	1.078	1.082	0.000
Neuroticism, Anxiety	1.261	1.408	0.000
Neuroticism, Depression	1.323	1.562	0.000
Neuroticism, Emotional Volatility	1.325	1.060	0.000

Table 2: Variances in Personality Among Siblings and Placebo-Pairs

Note: Showing the variance of the absolute gap in personality traits and facets among sibling pairs (for families with more than two sibling-respondents, we randomly selected two for this exercise), and in the column "Placebo sd," showing the variance of the gap in personality traits among two randomly chosen respondents. The p-value tests equality of the variances.

shrinking again in the very oldest. This is exemplified in panel A — illnesses as wide ranging as lung cancer, bronchitis, atherosclerosis, and heart attacks. Panel B of Fig. 2 shows examples where a diagnosis is quite prevalent at all ages instead of being limited to older patients, and where the gradient is largest in the youngest individuals. These are broken arms or slipped discs. Finally, panel C shows that some illnesses have no education gradient (such as tumors in the lymphatic system, or malignant tumors of the intestine), even though their baseline probability increases with age.

We repeated this exercise for all 100 ICD-10 codes. While fascinating and certainly useful to understand the origin of the education-health gradient, these 100 diagnoses are unwieldy to work with. Therefore, we fall back to summary measures that have been suggested in the literature. The first summary measures of health are available for the general population (from the hospital registers). We therefore contrast gradients in the population to the gradient in the survey sample only. Clearly, the survey response was not gravely selected on health outcomes, as the gradients look entirely comparable.

Figure 3 shows that there is a clear gradient in ever being hospitalized throughout the last year, and in the number of doctor visits. The gradient is somewhat decreasing with age for these two measures, as it is for the count of different ICD-10 codes registered in 2018. In contrast, expected 10-year mortality from the Charlson Comorbidity Index is increasing with age and the gap between individuals with the highest and lowest educational achievement also increases.

We next show gradients in subjective health evaluations, and health behaviors. There is a significant gradient in self-reported health—see Fig. 4. Recall that the definition of "bad health" was responses "tolerable" or "bad" on "Would you say your health is..." instead of excellent, very good or good. Obesity, indicated by a BMI exceeding 30, also displays a significant education gradient throughout life. Clearly, there is value added in complementing objective diagnoses of illnesses with these evaluations of individuals and continuous markers of health. Following up on the BMI differences, we explore whether there are gradients in healthy eating, exercising, or sleeping (all risk factors for obesity). While there are gradients in diet and eating and sleep, there is none in physical activity.

There is also a gradient for smoking, see Fig. 5. While there is a small *reverse* gradient for frequent (light) drinking that emerges with age, there is no gradient in *binge* drinking, or for the average number of drinks consumed per week.



Note: Non-parametric estimates from kernel-weighted local polynomial regressions of probabilities of individual diagnoses (one for each subfigure) on age by education level (with associated 95% confidence bands), not adjusting for any other demographic or background characteristics. "Low" education covers lower secondary education (compulsory schooling), "pjddle" is higher secondary and lower tertiary, and "high" a university education such as Bachelor, Master, and Doctoral degrees. Diagnoses are observed any time in 2018. Sample: All residents aged 20-75 in the Danish population register of 2019.



Note: Non-parametric estimates from kernel-weighted local polynomial regressions (with associated 95% confidence bands), of probabilities of being ever hospitalized (including outpatient) in 2018, the number of visits at the general practitioner ("doctor"), the count of ICD-10 codes registered in 2018, and the Charlson Comorbidity Index (based on diagnoses in the last 5 years), by age. . Sample: Population aged 20-75 in 2018 (panel a), or survey respondents age 20-75 (panel b).



Figure 4: Gradient in Self-Reported Health and Behaviors

Note: Definitions of variables: Physical activity: Less than 3 days per week with moderate or vigorous physical activity. Bad Diet: Disagree partially/entirely on "Do you follow a health-conscious diet?" Sample: Survey respondents ages 20-75.



Figure 5: Gradient in Smoking and Drinking

Note: Definitions of variables: Current smoker: Answer "yes" to "Are you currently smoking?"; Heavy drinker: answer "more than once a month" on "How many days in a month do you drink 5 drinks or more?" Sample: Survey respondents ages 20-75.

3.2 Personality as Unobserved Variable in the Education-Health Gradient

Personality traits and their facets are significantly associated with *years of education*, as demonstrated by Table 3. Openness to Experience is strongly positively associated with education, as one standard deviation increase in this facet would lead to over half a year of more schooling. This corresponds to the well-known positive correlation between IQ and Openness (von Stumm et al., 2011), and is further confirmed by fact that Intellectual Curiosity has the largest association of the facets. In our sample, Conscientiousness has a negative association with years of education. This is unexpected given the literature (see, for example MacCann et al., 2015; Poropat, 2009), but it has been found previously for this data in Gensowski et al. (2021). Extraversion has an overall positive association of Agreeableness with years of schooling. For both Extraversion and Emotional Stability, we find moderate positive associations of around a quarter of a standard deviation. In Extraversion, especially Assertiveness and Energy Level matter. In terms of other traits and characteristics, having an internal locus of control is positively associated with attainment. Willingness to take risks and patience have only a small positive role.

Personality also predicts health outcomes and health behaviors. In our data, selfrated health (or indicating not being limited for health reasons) is higher among individuals with greater Conscientiousness, Extraversion, and Emotional Stability, and lower Openness and Agreeableness (see details in Figs. S.1 to S.3). Conscientiousness and Extraversion are traits that are often found to be highly predictive of labor market outcomes even over long time spans (Gensowski, 2018; George et al., 2011). The facets driving those positive association are Organization (C) and Energy Level (E). In the cases of Conscientiousness and Neuroticism, the aggregate trait is the most highly individually associated. The facets with the largest positive association (meaning worse health outcomes) are Depression (N), Creative Imagination (O).

Conscientiousness has been described in the literature as the most important factor for health as well, but the role of facets has not been thoroughly explored. In our data, Conscientiousness decreases inpatient hospital contacts and hospitalization lengths, especially Responsibility has a negative association also with the number of diagnoses and the CCI, whereas Organization has positive associations. Previous studies have found that Conscientiousness overall reduces a range of behaviors that are expected to be detrimental to health, including the use of tobacco and alcohol, risky sexual behavior and driving, and unhealthy eating and physical inactivity (see the meta-analysis in Bogg and Roberts, 2004). Early-childhood conscientiousness is also negatively associated with substance abuse (Moffitt et al., 2011). More conscientious individuals follow diet and exercise regimens better (Hilliard et al., 2014).

Extraversion has a mixed relationship with health: it is associated both with heavy drinking and more smoking, but also better mental health (Hampson et al., 2007; Kern et al., 2014; Savelyev and Tan, 2019). The same pattern is observed in this study: Extraversion has an overall positive association with bad health outcomes, but this is driven purely by Sociability, and to a lesser degree Assertiveness. They outweigh the very positive association of Energy Level with positive health outcomes and behaviors (see, for example, the association with hospitalization lengths, panel c of Fig. S.1, count of diseases, being obese in panel c of Fig. S.2, or exercising in panel c of Fig. S.3). A popular theory is that Sociability is associated with more gregarious behavior that also includes activities that are detrimental to health, such as drinking and smoking. Indeed they are positively associated with smoking (panel b of Fig. S.3) and drinking, especially heavy drinking (panel f of Fig. S.3).

Much like Extraversion, Openness has a some positive and some negative associations with health outcomes. Individuals with greater Openness to Experience are less likely to follow a bad diet, be obese, physically inactive, but also more likely to drink. The overall association with hospitalizations and length of hospitalizations is negative, but the relation to *bad self-rated* health and mental health problems is positive. There are notable differences on the facet level: while creative imagination increases hospitalizations, number of doctor visits, count of diagnoses, self-rated health, BMI and drinking etc. whereas other facets (intellectual curiosity, but especially aesthetic sensitivity) have negative point estimates Finally, note that personality even predicts social distancing behavior during the current Covid-19 pandemic (Ludeke et al., 2021).

Agreeableness shows striking heterogeneities in the effects of its facets. While the overall trait is generally associated with worse health outcomes, Respectfulness has consistent negative associations with hospitalizations, diagnoses, obesity, bad diet, and smoking. The overall trait is also associated with a better diet and significantly less drinking (both in frequency and amount), whereas the facet of Trust is associated with a greatly increased probability of smoking.

Neuroticism is associated with worse health outcomes in all domains, and all facets point in the same direction. Especially Depression is associated with greater self-rated mental health difficulties and general health, but also greater healthcare utilization and the number of diagnoses. The only exceptions where one facet of Neuroticism has a negative coefficient is Anxiety, which is associated with a lower probability of smoking and of being obese. The latter is, however, not to be understood as a better outcome in the true sense, because Anxiety is significantly *positively* associated with the probability of being underweight (BMI< 18.5, regression not shown).

Given the many significant associations between personality traits and years of schooling, personality is a prime candidate for personal characteristics that are driving the education-health gradient.

3.3 How much of the gradient is due to socio-emotional skills?

Our main analyses therefore regress health outcomes and behaviors on education, adding personality traits and other regressors sequentially. This is an exercise in the spirit of "kill the coefficient," as has been done in Andrews and Logan (2010); Conti and Hansman (2013); Cutler and Lleras-Muney (2010). Figures 6 to 8 always begin with a baseline gradient. This gradient is the coefficient on years of education in predicting each health outcome or behavior, in a regression that also controls for gender, age, and immigration status. The second coefficient has added the standard Big Five personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism). The third coefficient adds instead of the overall traits their individual facets (because the overall traits are based on all 15 items that the individual 3 facets are based on, there is considerable correlation between facets and traits, meaning that it is preferable to only include either one or the other). We then introduce gradually the following groups of covariates: Locus of Control; the economic preference parameters of risk preference and patience; and disposable income. Note that we take into account the maturation patterns of personality traits (see Gensowski et al., 2021) by using residual personality traits from a regression of each trait on 5-year age groups.

	(1)	(9)	(2)
Openness	(1)	(2)	(3)
O: Intellectual Curiosity	(0.023)	0.500***	0.416***
O: Aesthetic Sensitivity		(0.021) 0.248^{***}	(0.020) 0.238^{***}
O: Crostive Imagination		(0.016) 0.145***	(0.015)
G. creative imagination	0 4 - 0***	(0.018)	(0.017)
Conscientiousness	$(0.026)^{***}$		
C: Organization		-0.139^{***} (0.017)	-0.125^{***} (0.016)
C: Productiveness		-0.089^{***} (0.023)	-0.118^{***} (0.022)
C: Responsibility		0.043^{*} (0.025)	0.007 (0.024)
Extraversion	$\begin{array}{c} 0.235^{***} \\ (0.025) \end{array}$	(0.020)	(0.021)
E: Sociability		-0.054^{***} (0.017)	-0.056^{***} (0.016)
E: Assertiveness		0.258^{***}	0.124^{***}
E: Energy Level		(0.020) 0.266^{***} (0.020)	(0.013) 0.114^{***} (0.010)
Agreeableness	-0.050^{*}	(0.020)	(0.019)
A: Compassion	(0.020)	-0.070^{***}	-0.027
A: Respectfulness		(0.025) 0.103^{***} (0.025)	(0.021) 0.061^{***} (0.022)
A: Trust		(0.023) -0.102^{***} (0.022)	(0.023) -0.056^{***} (0.020)
Neuroticism	-0.251^{***}	()	()
N: Anxiety	(0.022)	-0.143^{***}	-0.069^{***}
N: Depression		(0.021) 0.054^{**}	0.149***
N: Emotional Volatility		(0.021) -0.121*** (0.010)	(0.021) -0.040** (0.018)
Female	-0.052	-0.040	0.232***
Age	(0.033) 0.008^{***}	(0.033) 0.008***	(0.031) 0.008***
Immigrant/Descendant	(0.001) -0.035	(0.001) 0.039	(0.001) 0.298^{***}
Locus of control (int)	(0.075)	(0.074)	(0.070) 0.268***
Dick eversion ()			(0.023)
RISK aversion(-)			(0.008)
Patience			$\begin{array}{c} 0.047^{***} \\ (0.008) \end{array}$
Income Q2			$\begin{array}{c} 0.656^{***} \\ (0.044) \end{array}$
Income Q3			1.409^{***} (0.042)
Income Q4 (Top)			2.388^{***}
Constant	13.833^{***}	13.800^{***}	(0.044) 11.356^{***} (0.124)
Observations	28079	28079	28079

Table 3: Association of Characteristics with Years of Education

Note: Coefficients from regressions of years of education, standard errors in parentheses. Omitted income category is the lowest quartile. P-values * < .10, ** < .05, *** < .01.

As Fig. 6 shows, the Big Five personality traits reduce the gradient in hospitalizations, inpatient contacts, hospitalization length, and number of doctor visits, by 8-15%. They reduce the gradient in a count of all diseases and the Charlson Comorbidity Index by 8-10%. That means that these summary measures of personality, that aggregate the information on personality at the highest level, and that are often available in economic datasets, are important contributors to inequality in health. Yet they hide information: using the facets of personality instead, which are much more fine-grained, the gradients are reduced by 16-23%. Locus of control is another personality trait that is complementary to the Big Five taxonomy, as evidenced by the further significant reductions that reduces the gradient by 27-39%. Adding economic preference parameters does not play a meaningful role for inequality in health by education. There is, however, a role for income, as adding it further reduces the gradient to a total reduction of 34-62%. This contradicts the statements in Smith (2004).

Complementing the objective health data, we see that the reductions of the gradient in terms of self-described health are similar - see panels a) and b) of Fig. 7. Adding personality facets reduces the gradient by about a third. Obesity is reduced by 23%. While differences in mental health problems by educational attainment are attributable to personality (-65% from including the Big Five factors), the facets contribute in an opposite fashion: the gradient increases slightly (to -58% in comparison to the baseline).

The gradient in unhealthy eating and little sleep resemble the gradient in BMI (reduction by 42% and 30% from the personality facets), see panels a) and b) of Fig. 8. The gradient in smoking is only weakly attributable to differences in socio-emotional skills (reduction by 5%). The gradient in physical (in)activity is "reduced" so much that it becomes positive when including personality traits and the other covariates. As for the gradient in frequent drinking, we first note that it is already reversed in the baseline, in the sense that years of education are associated *positively* (see panels d and e of Fig. 8). The positive gradient is, however, reduced by 11% from including facets of personality traits. Note that income has a larger effect than personality traits for reducing the gradients in smoking and drinking. The coefficient on years of education for predicting binge drinking increases in absolute magnitude from including covariates (panels f). This means that one should expect a slightly larger gradient in this health behavior than the one we see in cross-sectional data.

Figure 6: Gradient Reductions: Hospitalizations and Doctor Visits



Note: Showing the regression coefficients on years of education in predicting each outcome, using sibling fixed effects for the subsample of families in which at least two members responded to the survey. The baseline gradient (first point estimate) conditions on gender, age, and immigration status. The next two point estimates added the *Big Five* personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism), or their individual *facets*. Each subsequent point point estimate has added cumulatively Locus of Control (*LOC*); the economic preference parameters of risk preference and patience (*risk/patience*); and disposable income (*inc*). The percentages next to the coefficients are the relative reduction of the gradient relative to the baseline (the first point estimate). Number of observations for all panels: 28,079. See regression details in Table S.7.



Figure 7: Gradient Reductions: Self-Rated Health, BMI, MIH-5

Note: See notes to Fig. 6. Definition of "Bad health:" Would you say your health is... (excellent to bad), answer as less than "good." "Bad diet:" Disagree partially/entirely on "Do you follow a health-conscious diet?" Mental health difficulties are measured with the MHI-5, where increasing scores reflect greater psychological difficulties. Number of observations for panels: a) 27,385, b) 27,550, c) 27,628, d) 27,273. Regression results in Table S.8.



Figure 8: Gradient Reductions: Diet, Smoking, Exercise, Drinking

Note: See notes to Fig. 6. Number of observations for panels: a) 27,695, b) 27,382, c) 27,482, d) 27,768. Regression results in Table S.9.

3.4 How much of the gradient remains to be explained in Sibling-Fixed Effects?

One difficulty with the gradients observed in Section 3.3, as in the most eminent papers of this literature as well, is that they do not rely on exogenous variation in education. Instead, they show how a coefficient that is possibly picking up unobserved covariates changes from including more and more covariates. In this study, we have already been able to include more detailed covariates than many other studies. But we can go a step further by exploiting the fact that we have answers from sibling pairs. By observing the association of education and health outcomes within families, we obtain estimates that are not contaminated by shared family background, childhood environment, and partially even shared genes. A precedent for this type of analysis is found in Fletcher (2013); Fletcher and Lehrer (2011). They argue convincingly that within-family variation in personality identifies the association of these socio-emotional skills independently of family background and genetic endowments.

There is a gradient even within families, as evidenced by Figs. 9 to 11. It is smaller, but in the majority of cases statistically different from zero. Their magnitude is especially meaningful for outcomes such as hospitalizations, number of doctor visits, subjective health, and smoking. Furthermore, personality traits, and in particular the facets, still reduce the gradient by 14-43%. As before, the gradients in drinking and physical inactivity are positive, leading to rather strange patterns in terms of relative "reductions" of the gradients.

The inclusion of family fixed-effects reduces the baseline gradient to only a small extent in terms of hospitalizations or overall health and mental health (see details in Tables S.11 and S.13), but the degree of illness is shaped to a greater extent by family background and genes - see the significant reductions of the baseline gradient in terms of number of GP visits and diagnoses and the CCI (Table S.12). Family background seems to be a major determinant of health behaviors, as the gradient all but turns insignificant from including fixed effects (Tables S.14 and S.15). Naturally, personality facets cannot account for much of the very small gradients observed in obesity, diet, or exercise (although the percentage reductions are large).



Note: Showing the regression coefficients on years of education in predicting each outcome. The baseline gradient (first point estimate) conditions on gender, age, and immigration status. Each next point estimates has added cumulatively the *Big Five* personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism); their individual *facets*; Locus of Control (*LOC*); the economic preference parameters of risk preference and patience (*risk/patience*); and disposable income (*inc*). The percentages next to all but the first point estimate are the relative reduction of the gradient relative to the baseline. Number of observations for all panels: 19,122. See regression details in Tables S.11 and S.12.



Figure 10: Gradient Reductions: Self-Rated Health, BMI, Mental Health (MHI-5) — Sibling Fixed Effects

Note: See notes to Fig. 9. Definition of "Bad health:" Would you say your health is... (excellent to bad), answer as less than "good." "Bad diet:" Disagree partially/entirely on "Do you follow a health-conscious diet?" Mental health difficulties are measured with the MHI-5, where increasing scores reflect greater psychological difficulties. Number of observations for panels: a) 9,770, b) 9,830, c) 9,807 d) 9,413. Regression results in Tables S.13 and S.14.



Note: See notes to Fig. 9. Number of observations for panels: a) 9,660, b) 5,580, c) 9,540 d) 9,535 e) 9,686, f) 4,885. Regression results in Tables S.14 and S.15.

4 Discussion and Conclusion

The *education-health gradient* has been found in many countries and time periods, and research suggests that gradient has been increasing over the last few decades (Kreiner et al., 2018; Meara et al., 2008; Pappas et al., 1993). The previous literature discusses whether the link between education and health is causal, the direction of the link, and whether other unobserved factors, such as cognitive and socio-emotional skills, are affecting both education and health in the same direction (Conti and Hansman, 2013; Cutler and Lleras-Muney, 2010; Lleras-Muney, 2022; Savelyev, 2020).

Our paper documents how socio-emotional skills moderate the education-healthgradient using an extraordinarily large and representative survey (N=39,000), highquality measures of personality traits (facet-level Big Five Inventory) and background information through high-quality administrative registers: childhood environment, childhood health. We are able to control for environment and genes by using sibling fixed effects.

Contrary to Cutler and Lleras-Muney (2010), we find that socio-emotional skills and in particular fine-grained facet-level traits—are significant contributors to the educationhealth gradient, even after controlling for childhood environment and genes. For policymakers seeking to weaken the gradient, this implies that skill-building is a feasible avenue. It is notable that the role of education decreases once multidimensional human capital is accounted for. Together with the fact that the most recent literature strongly doubts whether formal schooling has causal effects on health (Lleras-Muney, 2022), this deemphasizes the role of formal schooling and instead strikes a chord for socio-emotional skills that can be strengthened through other channels.

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S Appendix

	Sociability	Tends to be quiet Is outgoing, sociable		
Extraversion	Assertiveness	Is dominant, acts as a leader Prefers to have others take charge		
	Energy Level	Is full of energy Is less active than other people		
	Compassion	Is compassionate, has a soft heart Can be cold and uncaring		
Agreeableness	Respectfulness	Is respectful, treats others with respect Is sometimes rude to others		
	Trust	Assumes the best about people Tends to find fault with others		
	Organization	Tends to be disorganized Keeps things neat and tidy		
Conscientiousness	Productiveness	Is persistent, works until the task is finished Has difficulty getting started on tasks		
	Responsibility	Can be somewhat careless Is reliable, can always be counted on		
	Anxiety	Is relaxed, handles stress well Worries a lot		
Negative Emotionality	Depression	Tends to feel depressed, blue Feels secure, comfortable with self		
	Emotional Volatility	Is emotionally stable, not easily upset Is temperamental, gets emotional easily		
	Intellectual Curiosity	Has little interest in abstract ideas Is complex, a deep thinker		
Open-Mindedness	Aesthetic Sensitivity	Is fascinated by art, music, or literature Has few artistic interests		
	Creative Imagination	Has little creativity Is original, comes up with new ideas		

Table S.1: List of Short BFI-2 Instrument, see Soto and John (2017a)

	Sociability	Tends to be quiet Is talkative Is outgoing, sociable Is sometimes shy, introverted		
Extraversion	Assertiveness	Is dominant, acts as a leader Has an assertive personality Prefers to have others take charge Finds it hard to influence people		
	Energy Level	Is full of energy Shows a lot of Enthusiasm Rarely feels excited or eager Is less active than other people		
	Compassion	Is compassionate, has a soft heart Can be cold and uncaring Is helpful and unselfish with others Feels little sympathy for others		
Agreeableness	Respectfulness	Is respectful, treats others with respect Is polite, courteous to others Is sometimes rude to others Starts arguments with others		
	Trust	Assumes the best about people Has a forgiving nature Tends to find fault with others Is suspicious of others' intentions		
Conscientiousness	Organization	Tends to be disorganized Is systematic, likes to keep things in order Keeps things neat and tidy Leaves a mess, doesn't clean up		
	Productiveness	Is efficient, gets things done Is persistent, works until the task is finished Tends to be lazy Has difficulty getting started on tasks		
	Responsibility	Can be somewhat careless Sometimes behaves irresponsibly Is reliable, can always be counted on Is dependable, steady		
	Anxiety	Is relaxed, handles stress well Worries a lot Rarely feels anxious or afraid Can be tense		
Negative Emotionality	Depression	Often feels sad Tends to feel depressed, blue Feels secure, comfortable with self Stays optimistic after experiencing a setback		
	Emotional Volatility	Is emotionally stable, not easily upset Is temperamental, gets emotional easily Keeps their emotions under control Is moody, has up and down mood swings		
	Intellectual Curiosity	Has little interest in abstract Ideas Is complex, a deep thinker Avoids intellectual, philosophical discussions Is curious about many different things		
Open-Mindedness	Aesthetic Sensitivity	Is fascinated by art, music, or literature Has few artistic interests Values art and beauty Thinks poetry and plays are boring		
	Creative Imagination	Has little creativity Is inventive, finds clever ways to do things Is original, comes up with new Ideas Has difficulty imagining things		

Table S.2: Full List of BFI-2 Items, see Soto and John $(2017\mathrm{b})$

Table S.3: List of Items for Locus of Control

	"How do you see things that happen in your life?"	
1	"I have little control over the things that happen to me."	
2	"There is really no way I can solve some of the problems I have."	
3	"There is little I can do to change many of the important things in my life."	
4	"I often feel helpless in dealing with the problems of life."	
5	"Sometimes I feel that I'm being pushed around in life."	
6	"What happens to me in the future mostly depends on me."	Reverse coded
7	"I can do just about anything I really set my mind to."	Reverse coded

Note: Response categories are from 1 = "completely disagree" via 4 = "neither disagree nor agree" to 7 = "completely agree". To form the index, we sum all items and divide by 7, resulting in a scale from 1-5.

Table S.4: List of MHI-5 Items, see Berwick et al. (1991)

	"How much of the time, during the last month, have you"					
1	" been a very nervous person?"	Anxiety				
2	" felt calm and peaceful?"	General positive affect				
3	" felt downhearted and blue?"	Depression				
4	" been a happy person?"	General positive affect				
5	" felt so down in the dumps that nothing could cheer you up?"	Behavioral/emotional control				

Note: Response categories are 1 = "None of the time," 2 = "A little of the time," 3 = "Some of the time," 4 = "A great deal of the time," 5 = "Most of the time," 6 = "All of the time.". Items 2 and 4 are reverse-coded. To form the index, we average all items, resulting in a scale from 5-30, with higher scores reflecting greater difficulties.

	Full Sample	Singletons	1 Sibling	2+ Siblings	No Sib Info	All Females	All Males
Female	$\begin{array}{c} 0.0811^{***} \\ (0.00311) \end{array}$	$\begin{array}{c} 0.0855^{***} \\ (0.0121) \end{array}$	$\begin{array}{c} 0.0935^{***} \\ (0.00585) \end{array}$	$\begin{array}{c} 0.0963^{***} \\ (0.00456) \end{array}$	0.0194^{**} (0.00749)	0 (.)	0 (.)
Age	$\begin{array}{c} 0.00315^{***} \\ (0.000143) \end{array}$	$\begin{array}{c} 0.00384^{***} \\ (0.000532) \end{array}$	$\begin{array}{c} 0.00343^{***} \\ (0.000268) \end{array}$	$\begin{array}{c} 0.00356^{***} \\ (0.000202) \end{array}$	-0.00103 (0.000788)	$\begin{array}{c} 0.00327^{***} \\ (0.000210) \end{array}$	0.00308^{***} (0.000198)
Age 17-20	0.169^{***} (0.0154)	0.199^{**} (0.0618)	0.161^{***} (0.0258)	$\begin{array}{c} 0.153^{***} \\ (0.0203) \end{array}$	-0.0915 (0.338)	$\begin{array}{c} 0.169^{***} \\ (0.0220) \end{array}$	$\begin{array}{c} 0.165^{***} \\ (0.0217) \end{array}$
Age $65+$	$\begin{array}{c} 0.0436^{***} \\ (0.00537) \end{array}$	0.0536^{**} (0.0179)	0.0578^{***} (0.0145)	0.0576^{***} (0.0136)	0.0388^{**} (0.0142)	-0.00725 (0.00788)	0.0960^{***} (0.00734)
Immigrant/Descendant	-0.118^{***} (0.00571)	-0.0176 (0.0344)	-0.0913^{***} (0.0211)	-0.0882^{***} (0.00892)	-0.224^{***} (0.0129)	-0.137^{***} (0.00812)	-0.0989^{***} (0.00801)
Years of education	0.0216^{***} (0.000580)	$\begin{array}{c} 0.0225^{***} \\ (0.00226) \end{array}$	$\begin{array}{c} 0.0154^{***} \\ (0.00117) \end{array}$	$\begin{array}{c} 0.0211^{***} \\ (0.000894) \end{array}$	0.0277^{***} (0.00118)	$\begin{array}{c} 0.0231^{***} \\ (0.000879) \end{array}$	$\begin{array}{c} 0.0191^{***} \\ (0.000792) \end{array}$
Disposable Income	$\begin{array}{c} 2.35e - 08^{***} \\ (5.96e - 09) \end{array}$	3.94e - 08 (2.38e - 08)	1.84e - 08 (9.68 $e - 09$)	$1.85e - 08^*$ (9.40e - 09)	$5.91e - 08^{***} (1.53e - 08)$	2.61e - 08 (1.57e - 08)	$2.54e - 08^{***} (6.30e - 09)$
Charlson Comorbibidity Index	-0.00317^{**} (0.00100)	-0.00552 (0.00361)	-0.00264 (0.00231)	-0.00194 (0.00166)	-0.00302 (0.00168)	-0.00293^{*} (0.00138)	-0.00360^{*} (0.00147)
Count of diagnoses	-0.000465 (0.00236)	-0.000305 (0.00937)	-0.0130^{**} (0.00475)	0.00277 (0.00346)	$0.00572 \\ (0.00511)$	-0.00196 (0.00330)	0.00205 (0.00345)
Any hospitalization	-0.0242^{***} (0.00653)	-0.0282 (0.0259)	-0.0307^{*} (0.0128)	-0.0290^{**} (0.00955)	-0.0155 (0.0144)	-0.0213^{*} (0.00874)	-0.0326^{**} (0.0100)
Total nights hospitalized	0.00102^{*} (0.000433)	0.00181 (0.00199)	0.00286^{**} (0.00106)	0.00126^{*} (0.000620)	-0.000729 (0.000802)	0.00136^{*} (0.000648)	0.000478 (0.000580)
Number of visits at doctor	0.000277 (0.000196)	0.000692 (0.000738)	0.00115^{**} (0.000386)	0.000167 (0.000297)	-0.00108^{**} (0.000406)	-0.000277 (0.000258)	0.000865^{**} (0.000309)
Constant	-0.128^{***} (0.00882)	-0.186^{***} (0.0355)	-0.0684^{***} (0.0161)	-0.144^{***} (0.0127)	0.129^{*} (0.0505)	-0.0564^{***} (0.0133)	-0.105^{***} (0.0116)
Observations	96,006	6,534	27,687	44,752	17,033	47,733	48,273

Table S.5: Regression of Survey Response, by Number of Siblings and Gender

Standard errors in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Note: Showing regression coefficients predicting survey response, each column for a different sample. Age is entered both linearly as well as with two additional categories to capture potential non-linearities. Covariate definitions: Disposable income corresponds to personal income after tax and interests plus rental value of real estate. The "Count of diagnoses" corresponds to the count (in the year of 2018) of separate ICD-10 diseases, counting any diagnoses given by a hospital but excluding hospital contacts for screening, preventive care, and pregnancy- or birth-related contacts. Similarly, the count of nights hospitalized excludes pregnancy and birth-related contacts. The Charlson Comorbidity Index is based on hospital diagnoses occurring during 20 years of data, from 1999-2018.

Table S.6: Descriptive Statistics for Full Sample

	mean	sd
Age on May 1 2020	47.33	17.60
Female	0.55	0.50
High education (parents/own)	0.42	0.49
High education of parents	0.34	0.47
High education	0.35	0.48
Education: Compulsory	0.26	0.44
Education: Upper secondary	0.10	0.29
Education: Vocational secondary	0.30	0.46
Education: Short tertiary	0.04	0.20
Education: Medium tertiary	0.18	0.39
Education: Bachelor and longer tertiary	0.13	0.33
Above-median income (parents/own)	1.55	0.50
Total parental income	509,041	639, 197
Income	350,783	$454,\!115$
Single	0.37	0.48
Number of children under 18	0.15	0.43
Number of children	1.11	1.18
Ethnic minority	0.06	0.24
Survey completion on Monday	0.09	0.29
Survey completion on Tuesday	0.10	0.30
Survey completion on Wednesday	0.25	0.43
Survey completion on Thursday	0.17	0.37
Survey completion on Friday	0.13	0.34
Survey completion on Saturday	0.11	0.32
Survey completion on Sunday	0.15	0.35
Survey complete time: morning	0.15	0.36
Survey complete time: working hours	0.57	0.49
Survey complete time: evening	0.23	0.42
Survey complete time: night	0.04	0.20
Openness	0.00	0.99
Openness, Intellectual Curiosity	0.00	1.00
Openness, Aesthetic Sensitivity	0.00	1.00
Openness, Creative Imagination	0.00	1.00
Conscientiousness	0.01	0.99
Conscientiousness, Organization	0.00	1.00
Conscientiousness, Productiveness	0.01	0.99
Conscientiousness, Responsibility	0.01	0.99
Extraversion	0.00	1.00
Extraversion, Sociability	0.00	1.00
Extraversion, Assertiveness	0.00	1.00
Extraversion, Energy Level	0.00	1.00
Agreeableness	0.00	0.99
Agreeableness, Compassion	0.00	1.00
Agreeableness, Respectfulness	0.00	0.99
Agreeableness, Trust	0.00	1.00
Neuroticism	-0.00	1.00
Neuroticism, Anxiety	0.00	1.00
Neuroticism, Depression	-0.00	1.00
Neuroticism, Emotional Volatility	-0.00	1.00
Observations	38,798	

Hospitalization		Inpatient Hos	ospitalization Nights J		ts Hospitalized		Number GP visits		Number Diagnoses		CCI	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years of Education	-0.011^{***} (0.001)	-0.005^{***} (0.001)	-0.005^{***} (0.001)	-0.004^{***} (0.001)	-0.089^{***} (0.010)	-0.041^{***} (0.010)	-0.345^{***} (0.019)	-0.176^{***} (0.020)	-0.022^{***} (0.002)	-0.008^{***} (0.002)	-0.032^{***} (0.004)	-0.015^{***} (0.004)
Female	0.184^{***} (0.006)	0.169^{***} (0.007)	0.016^{***} (0.003)	0.012^{***} (0.004)	0.419^{***} (0.049)	0.281^{***} (0.055)	2.817^{***} (0.098)	1.788^{***} (0.106)	0.021^{**} (0.010)	-0.010 (0.011)	0.080^{***} (0.020)	0.057^{***} (0.022)
Age	0.007^{***} (0.000)	0.007^{***} (0.000)	0.000^{***} (0.000)	0.000^{***} (0.000)	0.022^{***} (0.002)	0.022^{***} (0.002)	0.091^{***} (0.004)	0.089^{***} (0.004)	0.008^{***} (0.000)	0.009^{***} (0.000)	0.019^{***} (0.001)	0.019^{***} (0.001)
Immigrant/Descendant	0.019 (0.015)	0.004 (0.015)	0.013 (0.008)	$0.008 \\ (0.008)$	$ \begin{array}{c} 0.129 \\ (0.122) \end{array} $	-0.000 (0.122)	0.713^{***} (0.245)	$ \begin{array}{c} 0.132 \\ (0.237) \end{array} $	0.063^{**} (0.025)	$ \begin{array}{c} 0.022 \\ (0.025) \end{array} $	$\begin{array}{c} 0.047 \\ (0.049) \end{array}$	$\begin{array}{c} -0.012\\ (0.049) \end{array}$
O: Intellectual Curiosity		$-0.005 \\ (0.004)$		$\begin{array}{c} 0.001 \\ (0.002) \end{array}$		$ \begin{array}{c} -0.023 \\ (0.035) \end{array} $		$ \begin{array}{c} 0.021 \\ (0.068) \end{array} $		-0.003 (0.007)		$\begin{array}{c} -0.000 \\ (0.014) \end{array}$
O: Aesthetic Sensitivity		$\begin{array}{c} -0.009^{***} \\ (0.003) \end{array}$		$\begin{array}{c} -0.005^{***} \\ (0.002) \end{array}$		-0.083^{***} (0.026)		-0.126^{**} (0.052)		$\begin{array}{c} -0.018^{***} \\ (0.005) \end{array}$		$\begin{array}{c} 0.005 \\ (0.011) \end{array}$
O: Creative Imagination		0.008^{**} (0.004)		-0.000 (0.002)		$\begin{array}{c} 0.012 \\ (0.030) \end{array}$		0.208^{***} (0.058)		$0.008 \\ (0.006)$		$\begin{array}{c} -0.006 \\ (0.012) \end{array}$
C: Organization		$\begin{array}{c} 0.007^{**} \\ (0.003) \end{array}$		$\begin{array}{c} 0.001 \\ (0.002) \end{array}$		0.062^{**} (0.029)		$\begin{array}{c} 0.332^{***} \\ (0.056) \end{array}$		0.014^{**} (0.006)		0.024^{**} (0.012)
C: Productiveness		0.015^{***} (0.005)		$ \begin{array}{c} 0.000 \\ (0.002) \end{array} $		-0.031 (0.038)		$\begin{array}{c} 0.041 \\ (0.074) \end{array}$		0.019^{**} (0.008)		$0.015 \\ (0.015)$
C: Responsibility		-0.000 (0.005)		-0.000 (0.003)		$\begin{array}{c} 0.014 \\ (0.042) \end{array}$		$ \begin{array}{c} 0.072 \\ (0.081) \end{array} $		-0.014^{*} (0.008)		-0.018 (0.017)
E: Sociability		0.021^{***} (0.003)		0.007^{***} (0.002)		0.145^{***} (0.028)		0.729^{***} (0.054)		0.044^{***} (0.006)		0.042^{***} (0.011)
E: Assertiveness		0.011^{***} (0.004)		0.006^{***} (0.002)		0.121^{***} (0.033)		0.393^{***} (0.064)		0.032^{***} (0.007)		0.052^{***} (0.013)
E: Energy Level		-0.019^{***} (0.004)		-0.014^{***} (0.002)		-0.224^{***} (0.034)		-0.804^{***} (0.065)		-0.062^{***} (0.007)		-0.112^{***} (0.014)
A: Compassion		$0.004 \\ (0.004)$		0.006^{**} (0.002)		0.121^{***} (0.037)		0.454^{***} (0.072)		$0.008 \\ (0.008)$		$ \begin{array}{c} 0.023 \\ (0.015) \end{array} $
A: Respectfulness		-0.011^{**} (0.005)		-0.005^{*} (0.003)		-0.031 (0.041)		$\begin{array}{c} 0.040\\ (0.080) \end{array}$		-0.003 (0.008)		-0.006 (0.016)
A: Trust		0.013^{***} (0.004)		0.007^{***} (0.002)		0.119^{***} (0.036)		0.241^{***} (0.069)		0.035^{***} (0.007)		$ \begin{array}{c} 0.023 \\ (0.014) \end{array} $
N: Anxiety		0.008^{**} (0.004)		$ \begin{array}{c} 0.001 \\ (0.002) \end{array} $		-0.003 (0.035)		0.667^{***} (0.068)		0.008 (0.007)		-0.028^{**} (0.014)
N: Depression		0.011^{**} (0.004)		-0.002 (0.002)		-0.047 (0.036)		0.528^{***} (0.071)		$ \begin{array}{c} 0.003 \\ (0.007) \end{array} $		-0.040^{***} (0.015)
N: Emotional Volatility		$ \begin{array}{c} 0.000 \\ (0.004) \end{array} $		-0.002 (0.002)		$ \begin{array}{c} 0.037 \\ (0.031) \end{array} $		0.249^{***} (0.061)		$ \begin{array}{c} 0.001 \\ (0.006) \end{array} $		-0.013 (0.013)
Locus of control (int)		-0.044^{***} (0.005)		-0.023^{***} (0.003)		-0.512^{***} (0.040)		-1.447^{***} (0.078)		-0.132^{***} (0.008)		-0.247^{***} (0.016)
Risk aversion(-)		0.008^{***} (0.002)		0.003^{***} (0.001)		0.051^{***} (0.014)		0.091^{***} (0.027)		0.016^{***} (0.003)		0.016^{***} (0.006)
Patience		-0.000 (0.002)		0.000 (0.001)		-0.016 (0.013)		$ \begin{array}{c} 0.029 \\ (0.026) \end{array} $		0.000 (0.003)		$0.003 \\ (0.005)$
Income Q1 (Bottom)		0.000		0.000		0.000		0.000		0.000		0.000
Income Q2		-0.004 (0.009)		0.002 (0.005)		-0.111 (0.077)		-0.450^{***} (0.149)		-0.038^{**} (0.016)		-0.029 (0.031)
Income Q3		-0.014 (0.009)		-0.006 (0.005)		-0.203^{***} (0.076)		-0.757^{***} (0.147)		-0.071^{***} (0.015)		-0.061^{**} (0.031)
Income Q4 (Top)		-0.042^{***} (0.010)		-0.004 (0.005)		-0.300^{***} (0.080)		-1.064^{***} (0.156)		-0.105^{***} (0.016)		-0.103^{***} (0.032)
Constant	0.175^{***} (0.020)	0.239^{***} (0.029)	0.120^{***} (0.011)	0.166^{***} (0.016)	1.469^{***} (0.168)	2.802^{***} (0.247)	6.955^{***} (0.338)	10.713^{***} (0.480)	0.304^{***} (0.034)	0.597^{***} (0.050)	-0.209^{***} (0.068)	0.443^{***} (0.099)
Observations Average Outcome Pct. diff. to baseline	$28,079 \\ 0.505$	$28,079 \\ 0.505 \\ -52\%$	28,079 0.074	$28,079 \\ 0.074 \\ -34\%$	$28,079 \\ 1.607$	$28,079 \\ 1.607 \\ -55\%$	28,079 8.459	28,079 8.459 -49%	28,079 0.461	$28,079 \\ 0.461 \\ -62\%$	$28,079 \\ 0.402$	28,079 0.402 -53%

Table S.7: Explaining the Health Gradient in Hospital Contacts, GP visits, and Comorbidities, Full Sample

Note: Regression coefficients from OLS on full sample, ages 25-75. See Section 2 for variable descriptions.

	Bad He	alth	Limited bc o	of Health	BMI>30		MHI	-5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Years of Education	-0.022^{***} (0.001)	-0.007^{***} (0.001)	-0.025^{***} (0.001)	-0.009^{***} (0.001)	-0.017^{***} (0.001)	-0.009^{***} (0.001)	-0.159^{***} (0.009)	-0.028^{***} (0.007)
Female	0.013^{***} (0.005)	-0.018^{***} (0.005)	0.042^{***} (0.006)	0.009 (0.006)	-0.002 (0.005)	-0.002 (0.005)	0.544^{***} (0.048)	$\begin{array}{c} 0.013 \\ (0.039) \end{array}$
Age	0.002^{***} (0.000)	0.002^{***} (0.000)	0.004^{***} (0.000)	0.004^{***} (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.058^{***} (0.002)	-0.061^{***} (0.001)
Immigrant/Descendant	$\begin{array}{c} 0.061^{***}\\ (0.012) \end{array}$	$\begin{array}{c} 0.015\\ (0.011) \end{array}$	0.092^{***} (0.014)	$\begin{array}{c} 0.042^{***}\\ (0.013) \end{array}$	-0.037^{***} (0.012)	-0.047^{***} (0.012)	1.563^{***} (0.122)	1.027^{***} (0.088)
O: Intellectual Curiosity		-0.001 (0.003)		$\begin{array}{c} -0.005 \\ (0.004) \end{array}$		-0.023^{***} (0.003)		$\begin{array}{c} 0.218^{***}\\ (0.025) \end{array}$
O: Aesthetic Sensitivity		-0.008^{***} (0.002)		-0.009^{***} (0.003)		-0.009^{***} (0.003)		$0.009 \\ (0.019)$
O: Creative Imagination		0.023^{***} (0.003)		0.025^{***} (0.003)		0.011^{***} (0.003)		0.061^{***} (0.021)
C: Organization		-0.004 (0.002)		-0.001 (0.003)		-0.022^{***} (0.003)		$\begin{array}{c} 0.012\\ (0.020) \end{array}$
C: Productiveness		0.008^{**} (0.003)		0.009^{**} (0.004)		0.010^{***} (0.004)		0.052^{*} (0.027)
C: Responsibility		0.017^{***} (0.004)		$\begin{array}{c} 0.012^{***} \\ (0.004) \end{array}$		0.013^{***} (0.004)		$\begin{array}{c} -0.020 \\ (0.030) \end{array}$
E: Sociability		0.020^{***} (0.002)		0.026^{***} (0.003)		0.018^{***} (0.003)		$\begin{array}{c} -0.043^{**} \\ (0.020) \end{array}$
E: Assertiveness		$\begin{array}{c} 0.032^{***} \\ (0.003) \end{array}$		0.032^{***} (0.003)		0.031^{***} (0.003)		0.150^{***} (0.023)
E: Energy Level		$\begin{array}{c} -0.107^{***} \\ (0.003) \end{array}$		-0.113^{***} (0.004)		-0.084^{***} (0.003)		-0.216^{***} (0.024)
A: Compassion		0.006^{*} (0.003)		0.007^{*} (0.004)		0.008^{**} (0.004)		$\begin{array}{c} 0.018\\ (0.027) \end{array}$
A: Respectfulness		$ \begin{array}{c} 0.002 \\ (0.004) \end{array} $		-0.002 (0.004)		-0.017^{***} (0.004)		0.100^{***} (0.029)
A: Trust		0.018^{***} (0.003)		0.016^{***} (0.004)		0.013^{***} (0.003)		0.059^{**} (0.026)
N: Anxiety		0.007^{**} (0.003)		$\begin{array}{c} 0.012^{***}\\ (0.004) \end{array}$		-0.013^{***} (0.003)		0.549^{***} (0.025)
N: Depression		0.040^{***} (0.003)		0.026^{***} (0.004)		0.007^{**} (0.003)		1.608^{***} (0.026)
N: Emotional Volatility		-0.000 (0.003)		$ \begin{array}{c} 0.005 \\ (0.003) \end{array} $		0.011^{***} (0.003)		0.208^{***} (0.022)
Locus of control (int)		-0.118^{***} (0.003)		-0.120^{***} (0.004)		-0.017^{***} (0.004)		-1.407^{***} (0.029)
Risk aversion(-)		0.004^{***} (0.001)		0.007^{***} (0.001)		0.005^{***} (0.001)		0.036^{***} (0.010)
Patience		$ \begin{array}{c} 0.001 \\ (0.001) \end{array} $		0.003^{**} (0.001)		-0.004^{***} (0.001)		-0.006 (0.009)
Income Q1 (Bottom)		0.000		0.000		0.000		0.000
Income Q2		-0.062^{***} (0.007)		-0.074^{***} (0.008)		0.015** (0.007)		-0.268^{***} (0.055)
Income Q3		-0.101^{***} (0.007)		-0.109^{***} (0.008)		-0.020^{***} (0.007)		-0.223^{***} (0.054)
Income Q4 (Top)		-0.112^{***} (0.007)		-0.137^{***} (0.009)		-0.044^{***} (0.008)		-0.073 (0.058)
Constant	0.394^{***} (0.016)	0.708^{***} (0.021)	0.443^{***} (0.019)	0.724^{***} (0.026)	0.433^{***} (0.016)	0.408^{***} (0.024)	$ \begin{array}{c} 15.167^{***} \\ (0.166) \end{array} $	19.159^{***} (0.176)
Observations Average Outcome Pct. diff. to base gradient	27,385 0.190	27,385 0.190 -67%	27,550 0.314	$27,550 \\ 0.314 \\ -66\%$	27,628 0.192	27,628 0.192 -43%	27,273 10.204	27,273 10.204 -83%

Table S.8: Explaining the Health Gradient in Self-reported Health, BMI, and Mental Health, Full Sample

Note: Regression coefficients from OLS on full sample, ages 25-75. See Section 2 for variable descriptions.

	Bad D	liet	Smol	ker	Little Ex	ercise	Little S	leep	Frequent A	Alcohol	Heavy D	rinker
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years of Education	-0.011^{***} (0.001)	-0.005^{***} (0.001)	-0.018^{***} (0.001)	-0.013^{***} (0.001)	-0.001 (0.001)	0.002^{**} (0.001)	-0.004^{***} (0.002)	-0.004^{**} (0.002)	0.015^{***} (0.001)	0.010^{***} (0.001)	-0.007^{***} (0.002)	-0.008^{***} (0.002)
Female	$\begin{array}{c} -0.097^{***} \\ (0.004) \end{array}$	-0.082^{***} (0.005)	-0.021^{***} (0.004)	-0.024^{***} (0.005)	-0.015^{***} (0.005)	-0.004 (0.006)	-0.070^{***} (0.008)	$\begin{array}{c} -0.061^{***} \\ (0.009) \end{array}$	-0.114^{***} (0.005)	-0.095^{***} (0.006)	-0.151^{***} (0.008)	-0.146^{***} (0.009)
Age	$\begin{array}{c} -0.004^{***} \\ (0.000) \end{array}$	$\begin{array}{c} -0.004^{***} \\ (0.000) \end{array}$	-0.002^{***} (0.000)	$\begin{array}{c} -0.002^{***} \\ (0.000) \end{array}$	$\begin{array}{c} -0.003^{***} \\ (0.000) \end{array}$	$\begin{array}{c} -0.004^{***} \\ (0.000) \end{array}$	-0.001^{***} (0.000)	$\begin{array}{c} -0.001^{***} \\ (0.000) \end{array}$	0.009^{***} (0.000)	0.009^{***} (0.000)	0.004^{***} (0.000)	$\begin{array}{c} 0.004^{***}\\ (0.000) \end{array}$
Immigrant/Descendant	$\begin{array}{c} -0.055^{***} \\ (0.011) \end{array}$	$\begin{array}{c} -0.057^{***} \\ (0.011) \end{array}$	0.029^{***} (0.010)	$\begin{array}{c} 0.013 \\ (0.010) \end{array}$	0.040^{***} (0.014)	$\begin{array}{c} 0.039^{***} \\ (0.013) \end{array}$	$\begin{array}{c} 0.053^{***} \\ (0.020) \end{array}$	$\begin{array}{c} 0.046^{**} \\ (0.020) \end{array}$	$\begin{array}{c} -0.048^{***} \\ (0.012) \end{array}$	$\begin{array}{c} -0.043^{***} \\ (0.013) \end{array}$	$\begin{array}{c} -0.055^{**} \\ (0.023) \end{array}$	$\begin{array}{c} -0.063^{***} \\ (0.023) \end{array}$
O: Intellectual Curiosity		$\begin{array}{c} -0.012^{***} \\ (0.003) \end{array}$		$\begin{array}{c} 0.012^{***} \\ (0.003) \end{array}$		$^{-0.008^{**}}_{(0.004)}$		$\begin{array}{c} -0.003 \\ (0.006) \end{array}$		0.008^{**} (0.004)		$\begin{array}{c} -0.012^{**} \\ (0.006) \end{array}$
O: Aesthetic Sensitivity		$\begin{array}{c} -0.021^{***} \\ (0.002) \end{array}$		$\begin{array}{c} -0.007^{***} \\ (0.002) \end{array}$		$\begin{array}{c} -0.017^{***} \\ (0.003) \end{array}$		$\begin{array}{c} 0.003 \\ (0.004) \end{array}$		0.014^{***} (0.003)		0.022^{***} (0.004)
O: Creative Imagination		-0.005^{*} (0.003)		-0.003 (0.003)		$ \begin{array}{c} 0.003 \\ (0.003) \end{array} $		$0.006 \\ (0.005)$		-0.004 (0.003)		-0.012^{**} (0.005)
C: Organization		-0.023^{***} (0.003)		-0.002 (0.002)		-0.006^{**} (0.003)		-0.023^{***} (0.005)		$\begin{array}{c} 0.001 \\ (0.003) \end{array}$		0.009^{**} (0.005)
C: Productiveness		$\begin{array}{c} -0.013^{***} \\ (0.003) \end{array}$		0.011^{***} (0.003)		-0.024^{***} (0.004)		$0.008 \\ (0.006)$		-0.005 (0.004)		$\begin{array}{c} 0.001 \\ (0.006) \end{array}$
C: Responsibility		0.008^{**} (0.004)		-0.023^{***} (0.004)		0.012^{***} (0.005)		-0.002 (0.007)		$\begin{array}{c} -0.017^{***} \\ (0.004) \end{array}$		-0.038^{***} (0.007)
E: Sociability		$ \begin{array}{c} 0.003 \\ (0.002) \end{array} $		0.018^{***} (0.002)		0.007^{**} (0.003)		0.003 (0.004)		0.008^{***} (0.003)		0.048^{***} (0.004)
E: Assertiveness		0.012^{***} (0.003)		0.010^{***} (0.003)		0.014^{***} (0.004)		$ \begin{array}{c} -0.002 \\ (0.005) \end{array} $		0.007^{**} (0.003)		-0.001 (0.005)
E: Energy Level		-0.047^{***} (0.003)		-0.033^{***} (0.003)		-0.102^{***} (0.004)		$ \begin{array}{c} 0.002 \\ (0.005) \end{array} $		0.008^{**} (0.003)		0.010^{*} (0.005)
A: Compassion		-0.007^{**} (0.003)		-0.002 (0.003)		$ \begin{array}{c} 0.006 \\ (0.004) \end{array} $		-0.003 (0.006)		-0.017^{***} (0.004)		-0.012^{**} (0.006)
A: Respectfulness		-0.011^{***} (0.004)		-0.010^{***} (0.003)		-0.004 (0.004)		0.003 (0.007)		-0.006 (0.004)		-0.011^{*} (0.007)
A: Trust		-0.001 (0.003)		0.023^{***} (0.003)		0.007^{*} (0.004)		-0.003 (0.006)		-0.008^{**} (0.004)		$ \begin{array}{c} 0.002 \\ (0.006) \end{array} $
N: Anxiety		-0.002 (0.003)		-0.011^{***} (0.003)		-0.005 (0.004)		$ \begin{array}{c} 0.002 \\ (0.006) \end{array} $		$ \begin{array}{c} 0.001 \\ (0.004) \end{array} $		-0.003 (0.006)
N: Depression		0.009^{***} (0.003)		0.016^{***} (0.003)		$ \begin{array}{c} 0.000 \\ (0.004) \end{array} $		0.018^{***} (0.006)		0.016^{***} (0.004)		0.027^{***} (0.006)
N: Emotional Volatility		$ \begin{array}{c} 0.003 \\ (0.003) \end{array} $		$ \begin{array}{c} 0.001 \\ (0.003) \end{array} $		-0.002 (0.003)		0.008^{*} (0.005)		$0.005 \\ (0.003)$		$\begin{array}{c} 0.004 \\ (0.005) \end{array}$
Locus of control (int)		-0.014^{***} (0.004)		-0.016^{***} (0.003)		-0.021^{***} (0.004)		-0.055^{***} (0.006)		0.021^{***} (0.004)		0.011^{*} (0.007)
Risk aversion(-)		-0.002 (0.001)		0.009^{***} (0.001)		-0.003^{**} (0.002)		0.005^{**} (0.002)		0.003^{**} (0.001)		0.011^{***} (0.002)
Patience		-0.005^{***} (0.001)		-0.005^{***} (0.001)		-0.004^{**} (0.001)		$ \begin{array}{c} 0.001 \\ (0.002) \end{array} $		-0.005^{***} (0.001)		-0.009^{***} (0.002)
Income Q1 (Bottom)		0.000		0.000		0.000		0.000		0.000		0.000
Income Q2		0.018^{***} (0.007)		-0.030^{***} (0.007)		0.009 (0.008)		0.035^{***} (0.012)		0.004 (0.008)		-0.018 (0.013)
Income Q3		0.001 (0.007)		-0.060^{***} (0.006)		0.028^{***} (0.008)		0.065^{***} (0.012)		0.020** (0.008)		-0.021^{*} (0.012)
Income Q4 (Top)		-0.012^{*} (0.007)		-0.080^{***} (0.007)		0.042^{***} (0.009)		0.060^{***} (0.013)		0.067^{***} (0.008)		-0.001 (0.013)
Constant	0.600^{***} (0.015)	0.606^{***} (0.022)	$\begin{array}{c} 0.494^{***} \\ (0.014) \end{array}$	0.505^{***} (0.021)	0.490^{***} (0.019)	0.537^{***} (0.027)	0.603^{***} (0.027)	0.721^{***} (0.040)	-0.359^{***} (0.017)	-0.385^{***} (0.025)	0.344^{***} (0.027)	0.314^{***} (0.041)
Observations Average Outcome Diff. to baseline	$27,695 \\ 0.161$	$27,695 \\ 0.161 \\ -56\%$	$27,382 \\ 0.139$	27,382 0.139 -30%	27,482 0.281	27,482 0.281	$\substack{16,149\\0.432}$	$ \begin{array}{r} 16,149 \\ 0.432 \\ -7\% \end{array} $	$27,768 \\ 0.250$	$27,768 \\ 0.250 \\ -36\%$	$14,761 \\ 0.356$	$14,761 \\ 0.356 \\ 6\%$

Table S.9: Explaining the Health Gradient in Health Behaviors, Full Sample

Note: Regression coefficients from OLS on full sample, ages 25-75.. See Section 2 for variable descriptions.

	CCI (5	years)	100 diseas	e count	Always wear	seat belt	Do not always	have breakfast
-	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Years of Education	$\begin{array}{c} -0.019^{***} \\ (0.002) \end{array}$	$\begin{array}{c} -0.009^{***} \\ (0.003) \end{array}$	-0.034^{***} (0.003)	$\begin{array}{c} -0.016^{***} \\ (0.003) \end{array}$	0.002^{***} (0.000)	$\begin{array}{c} 0.001^{*} \\ (0.000) \end{array}$	$\begin{array}{c} -0.015^{***} \\ (0.001) \end{array}$	$\begin{array}{c} -0.012^{***} \\ (0.001) \end{array}$
Female	$\begin{array}{c} 0.012\\ (0.012) \end{array}$	$ \begin{array}{c} 0.004 \\ (0.013) \end{array} $	0.293^{***} (0.013)	$\begin{array}{c} 0.247^{***} \\ (0.015) \end{array}$	$\begin{array}{c} 0.014^{***} \\ (0.002) \end{array}$	$\begin{array}{c} 0.012^{***}\\ (0.002) \end{array}$	* -0.056^{***} (0.005)	$\begin{array}{c} -0.043^{***} \\ (0.005) \end{array}$
Age	$\begin{array}{c} 0.011^{***} \\ (0.000) \end{array}$	$\begin{array}{c} 0.011^{***} \\ (0.000) \end{array}$	$\begin{array}{c} 0.014^{***} \\ (0.000) \end{array}$	$\begin{array}{c} 0.014^{***} \\ (0.000) \end{array}$	$\begin{array}{c} 0.000 \\ (0.000) \end{array}$	$\begin{array}{c} 0.000 \\ (0.000) \end{array}$	$\begin{array}{c} -0.006^{***} \\ (0.000) \end{array}$	$\begin{array}{c} -0.006^{***} \\ (0.000) \end{array}$
Immigrant/Descendant	$0.018 \\ (0.029)$	-0.014 (0.029)	0.069^{**} (0.033)	$\begin{array}{c} 0.017 \\ (0.033) \end{array}$	-0.026^{***} (0.005)	-0.023^{***} (0.005)	* 0.111 *** (0.011)	0.100^{***} (0.011)
O: Intellectual Curiosity		$\begin{array}{c} 0.006 \\ (0.008) \end{array}$		-0.012 (0.010)		$\begin{array}{c} 0.002\\ (0.001) \end{array}$		$\begin{array}{c} 0.002 \\ (0.003) \end{array}$
O: Aesthetic Sensitivity		$-0.006 \\ (0.006)$		-0.033^{***} (0.007)		$\begin{array}{c} 0.000 \\ (0.001) \end{array}$		$-0.003 \\ (0.002)$
O: Creative Imagination		$-0.008 \\ (0.007)$		0.015^{*} (0.008)		$\begin{array}{c} -0.001 \\ (0.001) \end{array}$		$\begin{array}{c} 0.000 \\ (0.003) \end{array}$
C: Organization		$\begin{array}{c} 0.011^{*} \\ (0.007) \end{array}$		0.019^{**} (0.008)		$\begin{array}{c} -0.002^{*} \\ (0.001) \end{array}$		$\begin{array}{c} -0.019^{***} \\ (0.003) \end{array}$
C: Productiveness		$\begin{array}{c} 0.004 \\ (0.009) \end{array}$		0.030^{***} (0.010)		$\begin{array}{c} -0.001 \\ (0.001) \end{array}$		$\begin{array}{c} 0.005 \\ (0.004) \end{array}$
C: Responsibility		$^{-0.007}_{(0.010)}$		$\begin{array}{c} -0.009 \\ (0.011) \end{array}$		$\begin{array}{c} 0.004^{***}\\ (0.001) \end{array}$	*	$\begin{array}{c} -0.018^{***} \\ (0.004) \end{array}$
E: Sociability		0.029^{***} (0.007)		0.061^{***} (0.008)		$\begin{array}{c} -0.000 \\ (0.001) \end{array}$		$\begin{array}{c} 0.010^{***} \\ (0.003) \end{array}$
E: Assertiveness		$\begin{array}{c} 0.030^{***} \\ (0.008) \end{array}$		$\begin{array}{c} 0.041^{***} \\ (0.009) \end{array}$		$\begin{array}{c} 0.000 \\ (0.001) \end{array}$		$\begin{array}{c} 0.019^{***} \\ (0.003) \end{array}$
E: Energy Level		$\begin{array}{c} -0.069^{***} \\ (0.008) \end{array}$		$\begin{array}{c} -0.079^{***} \\ (0.009) \end{array}$		$\begin{array}{c} 0.002^{*} \\ (0.001) \end{array}$		$\begin{array}{c} -0.030^{***} \\ (0.003) \end{array}$
A: Compassion		$\begin{array}{c} 0.005 \\ (0.009) \end{array}$		$\begin{array}{c} 0.017^{*} \\ (0.010) \end{array}$		$\begin{array}{c} 0.002 \\ (0.001) \end{array}$		$\begin{array}{c} -0.007^{**} \\ (0.003) \end{array}$
A: Respectfulness		$\begin{array}{c} -0.001 \\ (0.010) \end{array}$		$^{-0.012}_{(0.011)}$		$\begin{array}{c} 0.003^{*} \\ (0.001) \end{array}$		$\begin{array}{c} -0.004 \\ (0.004) \end{array}$
A: Trust		0.018^{**} (0.009)		0.045^{***} (0.010)		$\begin{array}{c} -0.001 \\ (0.001) \end{array}$		0.008^{**} (0.003)
N: Anxiety		$^{-0.021^{**}}_{(0.008)}$		$\begin{array}{c} 0.022^{**} \\ (0.009) \end{array}$		$\begin{array}{c} -0.000 \\ (0.001) \end{array}$		$\begin{array}{c} -0.009^{***} \\ (0.003) \end{array}$
N: Depression		$\begin{array}{c} -0.029^{***} \\ (0.009) \end{array}$		$\begin{array}{c} 0.005 \\ (0.010) \end{array}$		$\begin{array}{c} 0.004^{***}\\ (0.001) \end{array}$	*	$\begin{array}{c} 0.013^{***} \\ (0.003) \end{array}$
N: Emotional Volatility		$\begin{array}{c} -0.008 \\ (0.008) \end{array}$		$\begin{array}{c} 0.001 \\ (0.008) \end{array}$		$\begin{array}{c} 0.000 \\ (0.001) \end{array}$		$\begin{array}{c} -0.001 \\ (0.003) \end{array}$
Locus of control (int)		$\begin{array}{c} -0.148^{***} \\ (0.010) \end{array}$		$\begin{array}{c} -0.174^{***} \\ (0.011) \end{array}$		$\begin{array}{c} 0.004^{***}\\ (0.001) \end{array}$	*	$\begin{array}{c} -0.021^{***} \\ (0.004) \end{array}$
Risk aversion(-)		0.010^{***} (0.003)		0.023^{***} (0.004)		-0.002^{***} (0.001)	*	$\begin{array}{c} 0.007^{***} \\ (0.001) \end{array}$
Patience		$-0.000 \\ (0.003)$		$ \begin{array}{c} 0.002 \\ (0.004) \end{array} $		$\begin{array}{c} 0.001^{*} \\ (0.000) \end{array}$		$\begin{array}{c} -0.002 \\ (0.001) \end{array}$
Income Q1 (Bottom)		0.000 (.)		0.000 (.)		0.000(.)		0.000 (.)
Income Q2		$\begin{array}{c} -0.012 \\ (0.018) \end{array}$		-0.032 (0.021)		$\begin{array}{c} 0.003 \\ (0.003) \end{array}$		-0.025^{***} (0.007)
Income Q3		-0.039^{**} (0.018)		-0.074^{***} (0.021)		0.008^{***} (0.003)	*	-0.039^{***} (0.007)
Income Q4 (Top)		-0.059^{***} (0.019)		-0.127^{***} (0.022)		0.010^{***} (0.003)	*	-0.038^{***} (0.007)
Constant	-0.100^{**} (0.041)	0.297^{***} (0.059)	$\begin{array}{c} 0.447^{***} \\ (0.046) \end{array}$	0.794^{***} (0.067)	0.958^{***} (0.006)	0.954^{***} (0.009)		0.792^{***} (0.023)
Observations Average Outcome Pct. diff. to baseline	$28,079 \\ 0.222$	$28,079 \\ 0.222 \\ -54\%$	$28,079 \\ 0.857$	$28,079 \\ 0.857 \\ -53\%$	$ \begin{array}{r} 16,148 \\ 0.988 \end{array} $	$16,148 \\ 0.988 \\ -58\%$	$27,780 \\ 0.185$	$27,780 \\ 0.185 \\ -21\%$

Table S.10: Explaining the Health Gradient in Additional Outcomes, Full Sample

Note: Regression coefficients from OLS on full sample, ages 25-75.. See Section 2 for variable descriptions.

Figure S.1: Coefficients on Personality Traits and Facets, Predicting Hospitalizations and Doctor Visits

(a) Hospital in/out-patient contacts

(b) Inpatient contacts with hospital



Note: Showing coefficients in (black) for the Big-Five factors, or (pink) for the 15 facets, from regressions predicting each outcome. Demographic controls included as covariates as well, but their coefficients not shown.



Figure S.2: Coefficients on Personality Traits and Facets, Predicting Self-rated Health and Diet

Note: Showing coefficients in (black) for the Big-Five factors, or (pink) for the 15 facets, from regressions predicting each outcome. Demographic controls included as covariates as well, but their coefficients not shown.



Note: Showing coefficients in (black) for the Big-Five factors, or (pink) for the 15 facets, from regressions predicting each outcome. Demographic controls included as covariates as well, but their coefficients not shown.

	H	lospitalizatio	n	Inpati	ent Hospital	ization	Nig	hts Hospital	ized
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years of Education	-0.017^{***} (0.001)	-0.012^{***} (0.003)	-0.006^{*} (0.003)	-0.006^{***} (0.001)	-0.004^{**} (0.002)	-0.002 (0.002)	-0.103^{***} (0.012)	-0.065^{**} (0.028)	-0.012 (0.030)
Female	$\begin{array}{c} 0.198^{***} \\ (0.007) \end{array}$	0.220^{***} (0.014)	$\begin{array}{c} 0.207^{***} \\ (0.016) \end{array}$	$\begin{array}{c} 0.025^{***} \\ (0.004) \end{array}$	$\begin{array}{c} 0.025^{***} \\ (0.007) \end{array}$	0.021^{**} (0.008)	$\begin{array}{c} 0.590^{***} \\ (0.056) \end{array}$	$\begin{array}{c} 0.685^{***} \\ (0.115) \end{array}$	$\begin{array}{c} 0.592^{***} \\ (0.133) \end{array}$
Age	$\begin{array}{c} 0.008^{***} \\ (0.000) \end{array}$	$\begin{array}{c} 0.009^{***} \\ (0.001) \end{array}$	$\begin{array}{c} 0.009^{***} \\ (0.001) \end{array}$	-0.000^{**} (0.000)	-0.001^{*} (0.001)	-0.001 (0.001)	$\begin{array}{c} 0.017^{***} \\ (0.003) \end{array}$	$\begin{array}{c} 0.007 \\ (0.013) \end{array}$	$\begin{array}{c} 0.009 \\ (0.013) \end{array}$
Immigrant/Descendant	$\begin{array}{c} 0.069^{***} \\ (0.024) \end{array}$	-0.014 (0.468)	$\begin{array}{c} 0.083 \\ (0.466) \end{array}$	$\begin{array}{c} 0.024^{*} \\ (0.013) \end{array}$	$\begin{array}{c} 0.014 \\ (0.242) \end{array}$	$\begin{array}{c} 0.073 \\ (0.243) \end{array}$	$\begin{array}{c} 0.214 \\ (0.195) \end{array}$	$\begin{array}{c} 0.100 \\ (3.961) \end{array}$	$\begin{array}{c} 0.268 \\ (3.950) \end{array}$
O: Intellectual Curiosity			$\begin{array}{c} 0.004 \\ (0.010) \end{array}$			-0.004 (0.005)			-0.031 (0.085)
O: Aesthetic Sensitivity			-0.004 (0.008)			-0.004 (0.004)			-0.119^{*} (0.064)
O: Creative Imagination			$\begin{array}{c} 0.021^{**} \\ (0.009) \end{array}$			$\begin{array}{c} 0.001 \\ (0.005) \end{array}$			$\begin{array}{c} 0.169^{**} \\ (0.073) \end{array}$
C: Organization			$\begin{array}{c} 0.014^{*} \\ (0.008) \end{array}$			0.010^{**} (0.004)			$\begin{array}{c} 0.149^{**} \\ (0.070) \end{array}$
C: Productiveness			$\begin{array}{c} 0.016 \\ (0.011) \end{array}$			-0.002 (0.006)			-0.124 (0.091)
C: Responsibility			-0.010 (0.012)			$\begin{array}{c} 0.004 \\ (0.006) \end{array}$			-0.001 (0.099)
E: Sociability			$\begin{array}{c} 0.022^{***} \\ (0.008) \end{array}$			$\begin{array}{c} 0.006 \\ (0.004) \end{array}$			0.160^{**} (0.068)
E: Assertiveness			$\begin{array}{c} 0.001 \\ (0.009) \end{array}$			$\begin{array}{c} 0.003 \\ (0.005) \end{array}$			-0.011 (0.079)
E: Energy Level			-0.029^{***} (0.010)			-0.018^{***} (0.005)			-0.250^{***} (0.082)
A: Compassion			$\begin{array}{c} 0.002\\ (0.011) \end{array}$			$\begin{array}{c} 0.003 \\ (0.005) \end{array}$			$\begin{array}{c} 0.052 \\ (0.089) \end{array}$
A: Respectfulness			-0.004 (0.012)			-0.008 (0.006)			-0.169^{*} (0.099)
A: Trust			-0.008 (0.010)			0.009^{*} (0.005)			$\begin{array}{c} 0.102 \\ (0.086) \end{array}$
N: Anxiety			$\begin{array}{c} 0.010 \\ (0.010) \end{array}$			$\begin{array}{c} 0.004 \\ (0.005) \end{array}$			-0.031 (0.084)
N: Depression			$\begin{array}{c} 0.009 \\ (0.010) \end{array}$			-0.005 (0.005)			-0.012 (0.087)
N: Emotional Volatility			-0.002 (0.009)			-0.005 (0.005)			$\begin{array}{c} 0.122\\ (0.075) \end{array}$
Locus of control (int)			-0.037^{***} (0.012)			-0.014^{**} (0.006)			-0.201^{**} (0.098)
Risk aversion(-)			$\begin{array}{c} 0.014^{***} \\ (0.004) \end{array}$			0.004^{*} (0.002)			$\begin{array}{c} 0.070^{**} \\ (0.035) \end{array}$
Patience			-0.005 (0.004)			-0.001 (0.002)			$\begin{array}{c} 0.008 \\ (0.032) \end{array}$
Income Q1 (Bottom)			0.000 (.)			0.000 (.)			0.000 (.)
Income Q2			-0.031 (0.022)			-0.010 (0.012)			-0.580^{***} (0.190)
Income Q3			-0.050^{**} (0.022)			-0.018 (0.012)			-0.466^{**} (0.189)
Income Q4 (Top)			-0.082^{***} (0.024)			-0.018 (0.013)			-0.875^{***} (0.206)
Constant	$\begin{array}{c} 0.204^{***} \\ (0.025) \end{array}$	$\begin{array}{c} 0.119 \\ (0.086) \end{array}$	$\begin{array}{c} 0.146 \\ (0.100) \end{array}$	$\begin{array}{c} 0.151^{***} \\ (0.013) \end{array}$	$\begin{array}{c} 0.176^{***} \\ (0.044) \end{array}$	$\begin{array}{c} 0.194^{***} \\ (0.052) \end{array}$	$\begin{array}{c} 1.785^{***} \\ (0.201) \end{array}$	$1.687^{**} \\ (0.726)$	1.701^{**} (0.846)
Observations Has FE? Pct. diff. to baseline Average Outcome	19,122 No	$\substack{19,122\\ \mathrm{FE}}$	$19,122 \\ FE \\ -51 \\ 0.478$	19,122 No	$\mathop{\mathrm{FE}}\limits^{19,122}$	$19,122 \\ FE \\ -47 \\ 0.066$	19,122 No	19,122 FE	$19,122 \\ FE \\ -82 \\ 1.452$

Table S.11: Explaining the Health Gradient in Hospital Contacts—Sibling Fixed Effects

	Number GP visits			Nu	mber Diagn	oses	CCI			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Years of Education	-0.401^{***} (0.023)	-0.262^{***} (0.053)	-0.102^{*} (0.053)	-0.028^{***} (0.002)	-0.010^{*} (0.005)	$\begin{array}{c} 0.003 \\ (0.005) \end{array}$	-0.026^{***} (0.004)	-0.013 (0.009)	$\begin{array}{c} 0.002 \\ (0.010) \end{array}$	
Female	3.400^{***} (0.114)	3.145^{***} (0.214)	2.170^{***} (0.239)	$\begin{array}{c} 0.055^{***} \\ (0.011) \end{array}$	$\begin{array}{c} 0.072^{***} \\ (0.021) \end{array}$	$\begin{array}{c} 0.042^{*} \\ (0.025) \end{array}$	$\begin{array}{c} 0.093^{***} \\ (0.020) \end{array}$	$\begin{array}{c} 0.147^{***} \\ (0.037) \end{array}$	$\begin{array}{c} 0.136^{***} \\ (0.043) \end{array}$	
Age	$\begin{array}{c} 0.064^{***} \\ (0.005) \end{array}$	0.051^{**} (0.024)	$\begin{array}{c} 0.067^{***} \\ (0.023) \end{array}$	$\begin{array}{c} 0.007^{***} \\ (0.001) \end{array}$	$\begin{array}{c} 0.001 \\ (0.002) \end{array}$	$\begin{array}{c} 0.002 \\ (0.002) \end{array}$	$\begin{array}{c} 0.016^{***} \\ (0.001) \end{array}$	0.008^{**} (0.004)	0.009^{**} (0.004)	
Immigrant/Descendant	$\begin{array}{c} 1.405^{***} \\ (0.395) \end{array}$	$\begin{array}{c} 1.297 \\ (7.373) \end{array}$	$4.445 \\ (7.119)$	$\begin{array}{c} 0.128^{***} \\ (0.039) \end{array}$	$\begin{array}{c} 0.017 \\ (0.740) \end{array}$	$\begin{array}{c} 0.163 \\ (0.735) \end{array}$	$\begin{array}{c} 0.086 \\ (0.070) \end{array}$	-0.011 (1.285)	$\begin{array}{c} 0.137 \\ (1.282) \end{array}$	
O: Intellectual Curiosity			$\begin{array}{c} 0.114 \\ (0.153) \end{array}$			-0.027^{*} (0.016)			-0.031 (0.028)	
O: Aesthetic Sensitivity			-0.044 (0.116)			-0.013 (0.012)			$\begin{array}{c} 0.037^{*} \\ (0.021) \end{array}$	
O: Creative Imagination			$\begin{array}{c} 0.319^{**} \\ (0.132) \end{array}$			$\begin{array}{c} 0.015 \\ (0.014) \end{array}$			$\begin{array}{c} 0.024 \\ (0.024) \end{array}$	
C: Organization			$\begin{array}{c} 0.401^{***} \\ (0.126) \end{array}$			0.028^{**} (0.013)			$\begin{array}{c} 0.036 \ (0.023) \end{array}$	
C: Productiveness			-0.323^{**} (0.164)			$\begin{array}{c} 0.005 \\ (0.017) \end{array}$			-0.030 (0.030)	
C: Responsibility			$\begin{array}{c} 0.072 \\ (0.178) \end{array}$			-0.013 (0.018)			-0.009 (0.032)	
E: Sociability			$\begin{array}{c} 0.623^{***} \\ (0.123) \end{array}$			$\begin{array}{c} 0.041^{***} \\ (0.013) \end{array}$			-0.003 (0.022)	
E: Assertiveness			$\begin{array}{c} 0.255^{*} \\ (0.142) \end{array}$			$\begin{array}{c} 0.010 \\ (0.015) \end{array}$			$\begin{array}{c} 0.031 \\ (0.026) \end{array}$	
E: Energy Level			-0.425^{***} (0.148)			-0.061^{***} (0.015)			-0.088^{***} (0.027)	
A: Compassion			$\begin{array}{c} 0.104 \\ (0.161) \end{array}$			-0.021 (0.017)			-0.002 (0.029)	
A: Respectfulness			$\begin{array}{c} 0.128 \\ (0.178) \end{array}$			0.035^{*} (0.018)			$\begin{array}{c} 0.006 \\ (0.032) \end{array}$	
A: Trust			$\begin{array}{c} 0.442^{***} \\ (0.154) \end{array}$			0.033^{**} (0.016)			$\begin{array}{c} 0.009 \\ (0.028) \end{array}$	
N: Anxiety			$\begin{array}{c} 0.829^{***} \\ (0.151) \end{array}$			$\begin{array}{c} 0.003 \\ (0.016) \end{array}$			-0.027 (0.027)	
N: Depression			$\begin{array}{c} 0.601^{***} \\ (0.157) \end{array}$			$\begin{array}{c} 0.011 \\ (0.016) \end{array}$			-0.019 (0.028)	
N: Emotional Volatility			$\begin{array}{c} 0.155 \\ (0.135) \end{array}$			$\begin{array}{c} 0.005 \\ (0.014) \end{array}$			$\begin{array}{c} 0.013 \\ (0.024) \end{array}$	
Locus of control (int)			-1.333^{***} (0.176)			-0.081^{***} (0.018)			-0.109^{***} (0.032)	
Risk aversion(-)			0.148^{**} (0.063)			$\begin{array}{c} 0.020^{***} \\ (0.006) \end{array}$			$\begin{array}{c} 0.008 \\ (0.011) \end{array}$	
Patience			-0.078 (0.057)			$\begin{array}{c} 0.000 \\ (0.006) \end{array}$			$\begin{array}{c} 0.014 \\ (0.010) \end{array}$	
Income Q1 (Bottom)			0.000 (.)			0.000 (.)			0.000 (.)	
Income Q2			-0.735^{**} (0.342)			-0.068^{*} (0.035)			-0.177^{***} (0.062)	
Income Q3			-1.323^{***} (0.340)			-0.120^{***} (0.035)			-0.239^{***} (0.061)	
Income Q4 (Top)			-1.435^{***} (0.372)			-0.173^{***} (0.038)			-0.245^{***} (0.067)	
Constant	$\frac{8.548^{***}}{(0.407)}$	7.377^{***} (1.351)	$\frac{10.486^{***}}{(1.525)}$	$\begin{array}{c} 0.415^{***} \\ (0.041) \end{array}$	$\begin{array}{c} 0.482^{***} \\ (0.136) \end{array}$	$\begin{array}{c} 0.537^{***} \\ (0.157) \end{array}$	-0.154^{**} (0.073)	-0.005 (0.235)	$\begin{array}{c} 0.217 \\ (0.275) \end{array}$	
Observations Has FE? Pct. diff. to baseline Average Outcome	19,122 No	19,122 FE	$ \begin{array}{r} 19,122 \\ FE \\ -61 \\ 7.813 \end{array} $	19,122 No	19,122 FE	$ \begin{array}{r} 19,122 \\ FE \\ -128 \\ 0.412 \end{array} $	19,122 No	19,122 FE	$ \begin{array}{r} 19,122 \\ FE \\ -115 \\ 0.288 \end{array} $	

Table S.12: Explaining the Health Gradient in GP visits and Comorbidities—Sibling Fixed Effects

		Bad Health Limited bc of Health MHI-5		MHI-5					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years of Education	-0.029^{***} (0.002)	-0.020^{***} (0.003)	-0.006^{**} (0.002)	-0.032^{***} (0.002)	-0.021^{***} (0.003)	-0.006^{*} (0.003)	-0.158^{***} (0.017)	-0.119^{***} (0.027)	$\begin{array}{c} 0.018 \\ (0.020) \end{array}$
Female	$\begin{array}{c} 0.022^{***} \\ (0.008) \end{array}$	$\begin{array}{c} 0.008 \\ (0.011) \end{array}$	-0.018 (0.011)	$\begin{array}{c} 0.055^{***} \\ (0.009) \end{array}$	$\begin{array}{c} 0.043^{***} \\ (0.013) \end{array}$	$\begin{array}{c} 0.021 \\ (0.014) \end{array}$	$\begin{array}{c} 0.519^{***} \\ (0.082) \end{array}$	$\begin{array}{c} 0.465^{***} \\ (0.111) \end{array}$	-0.044 (0.092)
Age	$\begin{array}{c} 0.003^{***} \\ (0.000) \end{array}$	$\begin{array}{c} 0.000 \\ (0.001) \end{array}$	$\begin{array}{c} 0.002 \\ (0.001) \end{array}$	$\begin{array}{c} 0.004^{***} \\ (0.000) \end{array}$	0.003^{*} (0.001)	$\begin{array}{c} 0.004^{***} \\ (0.001) \end{array}$	-0.066^{***} (0.004)	-0.066^{***} (0.012)	-0.045^{***} (0.009)
Immigrant/Descendant	$\begin{array}{c} 0.034 \\ (0.029) \end{array}$	1.038^{***} (0.362)	1.263^{***} (0.326)	$\begin{array}{c} 0.114^{***} \\ (0.034) \end{array}$	$\begin{array}{c} 0.531 \\ (0.434) \end{array}$	0.790^{*} (0.405)	1.530^{***} (0.322)	$2.200 \\ (5.267)$	$5.656 \\ (3.746)$
O: Intellectual Curiosity			-0.002 (0.007)			-0.013 (0.009)			$\begin{array}{c} 0.146^{**} \\ (0.058) \end{array}$
O: Aesthetic Sensitivity			$\begin{array}{c} 0.001 \\ (0.005) \end{array}$			$\begin{array}{c} 0.009 \\ (0.007) \end{array}$			$\begin{array}{c} 0.069 \\ (0.044) \end{array}$
O: Creative Imagination			$\begin{array}{c} 0.022^{***} \\ (0.006) \end{array}$			$\begin{array}{c} 0.028^{***} \\ (0.008) \end{array}$			-0.011 (0.050)
C: Organization			-0.012^{**} (0.006)			-0.009 (0.007)			-0.029 (0.048)
C: Productiveness			$\begin{array}{c} 0.001 \\ (0.008) \end{array}$			$\begin{array}{c} 0.012 \\ (0.009) \end{array}$			$\begin{array}{c} 0.153^{**} \\ (0.063) \end{array}$
C: Responsibility			$\begin{array}{c} 0.018^{**} \\ (0.008) \end{array}$			$\begin{array}{c} 0.005 \\ (0.010) \end{array}$			-0.038 (0.068)
E: Sociability			$\begin{array}{c} 0.021^{***} \\ (0.006) \end{array}$			$\begin{array}{c} 0.021^{***} \\ (0.007) \end{array}$			-0.070 (0.047)
E: Assertiveness			$\begin{array}{c} 0.020^{***} \\ (0.007) \end{array}$			$\begin{array}{c} 0.017^{**} \\ (0.008) \end{array}$			$\begin{array}{c} 0.058 \\ (0.054) \end{array}$
E: Energy Level			-0.100^{***} (0.007)			-0.119^{***} (0.009)			-0.149^{***} (0.056)
A: Compassion			$\begin{array}{c} 0.011 \\ (0.007) \end{array}$			$\begin{array}{c} 0.006 \\ (0.009) \end{array}$			$\begin{array}{c} 0.050 \\ (0.062) \end{array}$
A: Respectfulness			-0.004 (0.008)			-0.019^{*} (0.010)			$\begin{array}{c} 0.116^{*} \\ (0.068) \end{array}$
A: Trust			0.017^{**} (0.007)			0.019^{**} (0.009)			$\begin{array}{c} 0.008 \\ (0.059) \end{array}$
N: Anxiety			$\begin{array}{c} 0.003 \\ (0.007) \end{array}$			0.022^{**} (0.009)			$\begin{array}{c} 0.581^{***} \\ (0.058) \end{array}$
N: Depression			$\begin{array}{c} 0.040^{***} \\ (0.007) \end{array}$			$\begin{array}{c} 0.017^{*} \\ (0.009) \end{array}$			$\begin{array}{c} 1.564^{***} \\ (0.060) \end{array}$
N: Emotional Volatility			$\begin{array}{c} 0.005 \\ (0.006) \end{array}$			-0.010 (0.008)			$\begin{array}{c} 0.282^{***} \\ (0.051) \end{array}$
Locus of control (int)			-0.103^{***} (0.008)			-0.093^{***} (0.010)			-1.439^{***} (0.068)
Risk aversion(-)			$\begin{array}{c} 0.004 \\ (0.003) \end{array}$			0.007^{**} (0.004)			$\begin{array}{c} 0.026 \\ (0.024) \end{array}$
Patience			$\begin{array}{c} 0.003 \\ (0.003) \end{array}$			$\begin{array}{c} 0.003 \\ (0.003) \end{array}$			-0.004 (0.022)
Income Q1 (Bottom)			0.000(.)			0.000(.)			0.000 (.)
Income Q2			-0.089^{***} (0.016)			-0.126^{***} (0.020)			-0.468^{***} (0.131)
Income Q3			-0.141^{***} (0.016)			-0.150^{***} (0.020)			-0.418^{***} (0.130)
Income Q4 (Top)			-0.145^{***} (0.017)			-0.189^{***} (0.021)			-0.280^{**} (0.142)
Constant	0.465^{***} (0.029)	0.428^{***} (0.068)	$\begin{array}{c} 0.647^{***} \\ (0.071) \end{array}$	$\begin{array}{c} 0.528^{***} \\ (0.034) \end{array}$	0.439^{***} (0.081)	$\begin{array}{c} 0.592^{***} \\ (0.088) \end{array}$	$ \begin{array}{c} 15.562^{***} \\ (0.311) \end{array} $	$\begin{array}{c} 14.993^{***} \\ (0.702) \end{array}$	17.957^{***} (0.586)
Observations Has FE? Pct. diff. to baseline Average Outcome	9,770 No	9,770 FE	9,770 FE -69% 0.180	9,830 No	9,830 FE	9,830 FE -72% 0.293	9,413 No	9,413 FE	9,413 FE -115% 10.334

Table S.13: Explaining the Health Gradient in Self-reported Health—Sibling Fixed Effects

		BMI>30			Bad Diet		I	se	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years of Education	-0.021^{***} (0.002)	-0.003 (0.003)	$\begin{array}{c} 0.001 \\ (0.003) \end{array}$	-0.012^{***} (0.002)	-0.004 (0.003)	$\begin{array}{c} 0.002 \\ (0.003) \end{array}$	-0.002 (0.002)	$\begin{array}{c} 0.005 \ (0.003) \end{array}$	0.006^{*} (0.003)
Female	-0.005 (0.008)	-0.001 (0.011)	$\begin{array}{c} 0.005 \ (0.012) \end{array}$	-0.095^{***} (0.008)	-0.100^{***} (0.011)	-0.088^{***} (0.012)	-0.009 (0.009)	-0.025^{*} (0.013)	-0.011 (0.015)
Age	$\begin{array}{c} 0.001^{***} \\ (0.000) \end{array}$	-0.000 (0.001)	$\begin{array}{c} 0.000 \\ (0.001) \end{array}$	-0.005^{***} (0.000)	-0.005^{***} (0.001)	-0.005^{***} (0.001)	-0.003^{***} (0.000)	-0.005^{***} (0.001)	-0.004^{***} (0.001)
Immigrant/Descendant	-0.055^{*} (0.030)	$\begin{array}{c} 0.508 \ (0.359) \end{array}$	$\begin{array}{c} 0.519 \\ (0.354) \end{array}$	-0.054^{*} (0.029)	$\begin{array}{c} 0.032 \\ (0.365) \end{array}$	$\begin{array}{c} 0.044 \\ (0.357) \end{array}$	$\begin{array}{c} 0.088^{**} \\ (0.036) \end{array}$	$\begin{array}{c} 0.511 \\ (0.447) \end{array}$	$\begin{array}{c} 0.583 \\ (0.440) \end{array}$
O: Intellectual Curiosity			-0.014^{*} (0.008)			-0.009 (0.008)			$\begin{array}{c} 0.004 \\ (0.010) \end{array}$
O: Aesthetic Sensitivity			-0.005 (0.006)			-0.020^{***} (0.006)			-0.019^{***} (0.007)
O: Creative Imagination			-0.001 (0.007)			-0.014^{**} (0.007)			-0.010 (0.008)
C: Organization			-0.023^{***} (0.006)			-0.028^{***} (0.006)			-0.022^{***} (0.008)
C: Productiveness			-0.002 (0.008)			-0.014 (0.008)			-0.024^{**} (0.010)
C: Responsibility			$\begin{array}{c} 0.005 \ (0.009) \end{array}$			$\begin{array}{c} 0.006 \\ (0.009) \end{array}$			$\begin{array}{c} 0.013 \\ (0.011) \end{array}$
E: Sociability			$\begin{array}{c} 0.013^{**} \\ (0.006) \end{array}$			-0.006 (0.006)			-0.001 (0.008)
E: Assertiveness			$\begin{array}{c} 0.031^{***} \\ (0.007) \end{array}$			$\begin{array}{c} 0.007 \\ (0.007) \end{array}$			$\begin{array}{c} 0.009 \\ (0.009) \end{array}$
E: Energy Level			-0.060^{***} (0.007)			-0.047^{***} (0.008)			-0.079^{***} (0.009)
A: Compassion			$\begin{array}{c} 0.010 \\ (0.008) \end{array}$			-0.012 (0.008)			$\begin{array}{c} 0.001 \\ (0.010) \end{array}$
A: Respectfulness			-0.020^{**} (0.009)			-0.007 (0.009)			$\begin{array}{c} 0.007 \\ (0.011) \end{array}$
A: Trust			$\begin{array}{c} 0.015^{*} \\ (0.008) \end{array}$			-0.004 (0.008)			$\begin{array}{c} 0.008 \\ (0.010) \end{array}$
N: Anxiety			-0.010 (0.008)			$\begin{array}{c} 0.001 \\ (0.008) \end{array}$			-0.006 (0.010)
N: Depression			$\begin{array}{c} 0.020^{**} \\ (0.008) \end{array}$			-0.004 (0.008)			-0.002 (0.010)
N: Emotional Volatility			$\begin{array}{c} 0.008 \ (0.007) \end{array}$			$\begin{array}{c} 0.011^{*} \ (0.007) \end{array}$			$\begin{array}{c} 0.005 \ (0.008) \end{array}$
Locus of control (int)			-0.003 (0.009)			-0.006 (0.009)			-0.029^{**} (0.011)
Risk aversion(-)			$\begin{array}{c} 0.008^{**} \\ (0.003) \end{array}$			-0.003 (0.003)			-0.008^{**} (0.004)
Patience			-0.005^{*} (0.003)			-0.007^{**} (0.003)			$\begin{array}{c} 0.003 \\ (0.004) \end{array}$
Income Q1 (Bottom)			0.000 (.)			0.000 (.)			0.000(.)
Income Q2			$\begin{array}{c} 0.008 \\ (0.017) \end{array}$			$\begin{array}{c} 0.022 \\ (0.017) \end{array}$			$\begin{array}{c} 0.037^{*} \\ (0.022) \end{array}$
Income Q3			-0.004 (0.017)			-0.004 (0.017)			0.048^{**} (0.021)
Income Q4 (Top)			-0.020 (0.019)			-0.041^{**} (0.019)			$\begin{array}{c} 0.066^{***} \\ (0.023) \end{array}$
Constant	$\begin{array}{c} 0.442^{***} \\ (0.030) \end{array}$	$\begin{array}{c} 0.253^{***} \\ (0.067) \end{array}$	0.179^{**} (0.077)	$\begin{array}{c} 0.640^{***} \\ (0.029) \end{array}$	$\begin{array}{c} 0.549^{***} \\ (0.068) \end{array}$	$\begin{array}{c} 0.532^{***} \\ (0.078) \end{array}$	$\begin{array}{c} 0.502^{***} \\ (0.036) \end{array}$	$\begin{array}{c} 0.462^{***} \\ (0.084) \end{array}$	$\begin{array}{c} 0.498^{***} \ (0.096) \end{array}$
Observations Has FE? Pct. diff. to baseline Average Outcome	9,807 No	9,807 FE	9,807 FE -119% 0.198	9,660 No	9,660 FE	9,660 FE -147% 0.175	9,535 No	$\begin{array}{c} 9,535\\ \mathrm{FE} \end{array}$	$9,535 \ { m FE} \ 30\% \ 0.302$

Table S.14: Explaining the Health Gradient in BMI, Diet, Exercise—Sibling Fixed Effects

		Little Sleep		Fi	requent Alco	hol	I	Heavy Drinke	er
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Years of Education	-0.010^{***} (0.003)	-0.011^{**} (0.004)	-0.010^{**} (0.005)	$\begin{array}{c} 0.015^{***} \\ (0.002) \end{array}$	0.006^{**} (0.003)	$\begin{array}{c} 0.005^{*} \\ (0.003) \end{array}$	-0.003 (0.003)	-0.004 (0.004)	-0.003 (0.005)
Female	-0.128^{***} (0.013)	-0.150^{***} (0.018)	-0.134^{***} (0.021)	-0.105^{***} (0.008)	-0.101^{***} (0.011)	-0.083^{***} (0.013)	-0.164^{***} (0.013)	-0.143^{***} (0.018)	-0.127^{***} (0.021)
Age	0.001^{*} (0.001)	$\begin{array}{c} 0.003 \\ (0.002) \end{array}$	$\begin{array}{c} 0.004^{*} \\ (0.002) \end{array}$	$\begin{array}{c} 0.007^{***} \\ (0.000) \end{array}$	0.008^{***} (0.001)	$\begin{array}{c} 0.008^{***} \\ (0.001) \end{array}$	0.004^{***} (0.001)	$\begin{array}{c} 0.001 \\ (0.002) \end{array}$	$\begin{array}{c} 0.001 \\ (0.002) \end{array}$
Immigrant/Descendant	$\begin{array}{c} 0.072 \\ (0.054) \end{array}$	-0.992 (0.660)	-1.072 (0.658)	-0.012 (0.031)	-0.548 (0.373)	-0.588 (0.374)	-0.049 (0.088)	-0.992 (0.620)	-1.092^{*} (0.619)
O: Intellectual Curiosity			$\begin{array}{c} 0.020 \\ (0.013) \end{array}$			-0.010 (0.008)			-0.012 (0.014)
O: Aesthetic Sensitivity			$\begin{array}{c} 0.003 \\ (0.010) \end{array}$			$\begin{array}{c} 0.005 \\ (0.006) \end{array}$			0.021^{**} (0.010)
O: Creative Imagination			$\begin{array}{c} 0.014 \\ (0.011) \end{array}$			$\begin{array}{c} 0.003 \\ (0.007) \end{array}$			-0.004 (0.012)
C: Organization			-0.027^{**} (0.011)			$0.008 \\ (0.007)$			-0.000 (0.011)
C: Productiveness			$\begin{array}{c} 0.007 \\ (0.014) \end{array}$			$\begin{array}{c} 0.012 \\ (0.009) \end{array}$			$\begin{array}{c} 0.020 \\ (0.015) \end{array}$
C: Responsibility			-0.006 (0.015)			-0.023^{**} (0.009)			-0.023 (0.016)
E: Sociability			0.020^{*} (0.011)			$0.008 \\ (0.007)$			$\begin{array}{c} 0.037^{***} \\ (0.011) \end{array}$
E: Assertiveness			-0.018 (0.012)			$\begin{array}{c} 0.001 \\ (0.008) \end{array}$			-0.021^{*} (0.013)
E: Energy Level			-0.002 (0.013)			-0.000 (0.008)			-0.002 (0.013)
A: Compassion			-0.009 (0.013)			-0.020^{**} (0.009)			-0.011 (0.014)
A: Respectfulness			-0.012 (0.016)			-0.007 (0.009)			-0.018 (0.016)
A: Trust			-0.007 (0.013)			$\begin{array}{c} 0.001 \\ (0.008) \end{array}$			-0.015 (0.014)
N: Anxiety			-0.007 (0.013)			-0.003 (0.008)			-0.017 (0.013)
N: Depression			$\begin{array}{c} 0.027^{*} \\ (0.014) \end{array}$			$\begin{array}{c} 0.006 \\ (0.008) \end{array}$			0.028^{**} (0.014)
N: Emotional Volatility			$\begin{array}{c} 0.010 \\ (0.012) \end{array}$			-0.005 (0.007)			$\begin{array}{c} 0.019 \\ (0.012) \end{array}$
Locus of control (int)			-0.040^{***} (0.015)			$\begin{array}{c} 0.001 \\ (0.009) \end{array}$			$\begin{array}{c} 0.009 \\ (0.016) \end{array}$
Risk aversion(-)			$\begin{array}{c} 0.002 \\ (0.006) \end{array}$			-0.003 (0.003)			$\begin{array}{c} 0.008 \\ (0.006) \end{array}$
Patience			-0.001 (0.005)			-0.000 (0.003)			-0.001 (0.005)
Income Q1 (Bottom)			0.000(.)			0.000(.)			0.000(.)
Income Q2			$\begin{array}{c} 0.021 \\ (0.031) \end{array}$			$\begin{array}{c} 0.013 \\ (0.018) \end{array}$			$\begin{array}{c} 0.017 \\ (0.032) \end{array}$
Income Q3			$\begin{array}{c} 0.052^{*} \\ (0.030) \end{array}$			$\begin{array}{c} 0.021 \\ (0.018) \end{array}$			$\begin{array}{c} 0.027 \\ (0.031) \end{array}$
Income Q4 (Top)			0.048 (0.033)			0.039^{**} (0.020)			$\begin{array}{c} 0.031 \\ (0.034) \end{array}$
Constant	0.620^{***} (0.051)	0.559^{***} (0.113)	0.626^{***} (0.133)	-0.317^{***} (0.030)	-0.210^{***} (0.069)	-0.204^{**} (0.081)	$\begin{array}{c} 0.249^{***} \\ (0.052) \end{array}$	0.431^{***} (0.116)	0.302^{**} (0.137)
Observations Has FE? Pct. diff. to baseline Average Outcome	5,580 No	5,580 FE	$5,580 \\ FE \\ -6\% \\ 0.462$	9,686 No	9,686 FE	$9,686 \\ FE \\ -19\% \\ 0.204$	4,885 No	4,885 FE	4,885 FE -18% 0.330

Table S.15: Explaining the Health Gradient in Sleep and Alcohol— Sibling Fixed Effects

	(CCI (5 years	š)	10	0 disease co	unt	Alwa	ys wear seat	belt	Do not a	Do not always have br		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
Years of Education	-0.015^{***} (0.002)	-0.004 (0.006)	$\begin{array}{c} 0.005 \\ (0.006) \end{array}$	-0.046^{***} (0.003)	-0.026^{***} (0.007)	-0.007 (0.008)	0.003^{***} (0.001)	0.003^{**} (0.001)	0.002^{*} (0.001)	-0.021^{***} (0.002)	-0.015^{***} (0.003)	-0.013^{***} (0.003)	
Female	$\begin{array}{c} 0.032^{***} \\ (0.012) \end{array}$	$\begin{array}{c} 0.063^{***} \\ (0.024) \end{array}$	0.063^{**} (0.027)	$\begin{array}{c} 0.339^{***} \\ (0.015) \end{array}$	$\begin{array}{c} 0.369^{***} \\ (0.029) \end{array}$	$\begin{array}{c} 0.326^{***} \\ (0.034) \end{array}$	$\begin{array}{c} 0.012^{***} \\ (0.003) \end{array}$	0.010^{**} (0.004)	$\begin{array}{c} 0.005 \\ (0.005) \end{array}$	-0.072^{***} (0.008)	-0.079^{***} (0.011)	-0.056^{***} (0.013)	
Age	0.009^{***} (0.001)	$\begin{array}{c} 0.004 \\ (0.003) \end{array}$	$\begin{array}{c} 0.004 \\ (0.003) \end{array}$	$\begin{array}{c} 0.014^{***} \\ (0.001) \end{array}$	$\begin{array}{c} 0.009^{***} \\ (0.003) \end{array}$	$\begin{array}{c} 0.011^{***} \\ (0.003) \end{array}$	$\begin{array}{c} 0.000 \\ (0.000) \end{array}$	$\begin{array}{c} 0.000 \\ (0.000) \end{array}$	$\begin{array}{c} 0.000 \\ (0.000) \end{array}$	-0.006^{***} (0.000)	-0.006^{***} (0.001)	-0.006^{***} (0.001)	
Immigrant/Descendant	$\begin{array}{c} 0.040 \\ (0.042) \end{array}$	-0.008 (0.816)	$\begin{array}{c} 0.149 \\ (0.813) \end{array}$	$\begin{array}{c} 0.187^{***} \\ (0.053) \end{array}$	$\begin{array}{c} 0.009 \\ (1.013) \end{array}$	$ \begin{array}{c} 0.262 \\ (1.005) \end{array} $	-0.071^{***} (0.012)	-0.012 (0.160)	-0.010 (0.160)	$\begin{array}{c} 0.156^{***} \\ (0.031) \end{array}$	-0.442 (0.379)	-0.499 (0.377)	
O: Intellectual Curiosity			$\begin{array}{c} 0.015 \\ (0.017) \end{array}$			-0.027 (0.022)			-0.001 (0.003)			-0.000 (0.008)	
O: Aesthetic Sensitivity			-0.006 (0.013)			-0.020 (0.016)			$\begin{array}{c} 0.007^{***} \\ (0.002) \end{array}$			-0.007 (0.006)	
O: Creative Imagination			-0.003 (0.015)			$\begin{array}{c} 0.025 \\ (0.019) \end{array}$			$\begin{array}{c} 0.000 \\ (0.003) \end{array}$			-0.002 (0.007)	
C: Organization			$\begin{array}{c} 0.035^{**} \\ (0.014) \end{array}$			$\begin{array}{c} 0.036^{**} \\ (0.018) \end{array}$			$\begin{array}{c} 0.000 \\ (0.003) \end{array}$			-0.028^{***} (0.007)	
C: Productiveness			-0.020 (0.019)			$\begin{array}{c} 0.018 \\ (0.023) \end{array}$			$\begin{array}{c} 0.002 \\ (0.003) \end{array}$			-0.011 (0.009)	
C: Responsibility			-0.010 (0.020)			-0.015 (0.025)			$\begin{array}{c} 0.002 \\ (0.004) \end{array}$			-0.009 (0.010)	
E: Sociability			$\begin{array}{c} 0.004 \\ (0.014) \end{array}$			$\begin{array}{c} 0.062^{***} \\ (0.017) \end{array}$			$\begin{array}{c} 0.002 \\ (0.003) \end{array}$			$\begin{array}{c} 0.015^{**} \\ (0.007) \end{array}$	
E: Assertiveness			$\begin{array}{c} 0.014 \\ (0.016) \end{array}$			$\begin{array}{c} 0.001 \\ (0.020) \end{array}$			$\begin{array}{c} 0.003 \\ (0.003) \end{array}$			$\begin{array}{c} 0.013^{*} \\ (0.008) \end{array}$	
E: Energy Level			-0.045^{***} (0.017)			-0.072^{***} (0.021)			$\begin{array}{c} 0.005 \\ (0.003) \end{array}$			-0.021^{***} (0.008)	
A: Compassion			-0.005 (0.018)			-0.009 (0.023)			-0.001 (0.003)			-0.010 (0.009)	
A: Respectfulness			-0.003 (0.020)			$\begin{array}{c} 0.015 \\ (0.025) \end{array}$			$\begin{array}{c} 0.005 \\ (0.004) \end{array}$			$\begin{array}{c} 0.008 \\ (0.010) \end{array}$	
A: Trust			$\begin{array}{c} 0.001 \\ (0.018) \end{array}$			$\begin{array}{c} 0.026 \\ (0.022) \end{array}$			-0.004 (0.003)			-0.003 (0.008)	
N: Anxiety			-0.018 (0.017)			$\begin{array}{c} 0.024 \\ (0.021) \end{array}$			$\begin{array}{c} 0.001 \\ (0.003) \end{array}$			$^{-0.014^{*}}_{(0.008)}$	
N: Depression			-0.020 (0.018)			$\begin{pmatrix} 0.003 \\ (0.022) \end{pmatrix}$			$\begin{array}{c} 0.002 \\ (0.003) \end{array}$			$\begin{array}{c} 0.013 \\ (0.008) \end{array}$	
N: Emotional Volatility			$\begin{array}{c} 0.004 \\ (0.015) \end{array}$			$\begin{array}{c} 0.003 \\ (0.019) \end{array}$			-0.000 (0.003)			-0.004 (0.007)	
Locus of control (int)			-0.096^{***} (0.020)			-0.125^{***} (0.025)			$\begin{array}{c} 0.003 \\ (0.004) \end{array}$			-0.008 (0.009)	
Risk aversion(-)			$\begin{array}{c} 0.005 \\ (0.007) \end{array}$			$\begin{array}{c} 0.032^{***} \\ (0.009) \end{array}$			-0.003^{**} (0.001)			$\begin{array}{c} 0.009^{***} \\ (0.003) \end{array}$	
Patience			$\begin{array}{c} 0.011 \\ (0.007) \end{array}$			-0.005 (0.008)			$\begin{array}{c} 0.001 \\ (0.001) \end{array}$			-0.009^{***} (0.003)	
Income Q1 (Bottom)			0.000 (.)			0.000 (.)			0.000 (.)			0.000 (.)	
Income Q2			-0.117^{***} (0.039)			-0.099^{**} (0.048)			$\begin{array}{c} 0.002 \\ (0.007) \end{array}$			-0.025 (0.018)	
Income Q3			-0.178^{***} (0.039)			-0.165^{***} (0.048)			-0.001 (0.007)			-0.037^{**} (0.018)	
Income Q4 (Top)			-0.156^{***} (0.042)			-0.231^{***} (0.053)			-0.000 (0.008)			-0.020 (0.020)	
Constant	-0.104^{**} (0.043)	$\begin{array}{c} 0.009\\ (0.150) \end{array}$	$\begin{array}{c} 0.246 \\ (0.174) \end{array}$	$\begin{array}{c} 0.564^{***} \\ (0.055) \end{array}$	$\begin{array}{c} 0.502^{***} \\ (0.186) \end{array}$	0.632^{***} (0.215)	0.944^{***} (0.011)	0.939^{***} (0.027)	$\begin{array}{c} 0.954^{***} \\ (0.032) \end{array}$	$\begin{array}{c} 0.834^{***} \\ (0.031) \end{array}$	$\begin{array}{c} 0.782^{***} \\ (0.070) \end{array}$	$\begin{array}{c} 0.780^{***} \\ (0.082) \end{array}$	
Observations Has FE? Pct. diff. to baseline Average Outcome	19,122 No	19,122 FE	19,122 FE -217% 0.158	19,122 No	19,122 FE	19,122 FE -73% 0.789	5,586 No	5,586 FE	5,586 FE -16% 0.988	9,698 No	9,698 FE	9,698 FE -15% 0.207	

Table S.16: Explaining the Health Gradient in Additional Outcomes— Sibling Fixed Effects