

Education, Health, and Health Behaviours: An Attempt at Explaining the Education Gradient in Health in the Netherlands

Bachelor Thesis

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Abstract

The association between education and health has been discussed by many papers. Better-educated individuals report better health. However, a clear explanation for this education gradient remains a topic of discussion. An attempt is made at explaining the gradient by analysing the role health behaviours play in the association of education and health using survey data from the Netherlands in 2016. Health behaviours are found to explain a large portion of the education gradient, but do not explain it in its entirety.

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1 Introduction

With inequality becoming an increasingly discussed topic in the media, the health inequalities seen between different levels of socioeconomic status have been getting more attention as well, both in the Netherlands (NRC, 2016), and abroad (BBC, 2016). This phenomenon, often referred to as the social gradient in health in the literature, is one that has been getting more attention over time. According to research by the OECD, the average difference in life expectancy between the most and the least educated men in OECD countries was 7.7 years in 2015 (OECD, 2015). For women this difference amounted to 4.2 years. In the Netherlands, a country that generally scores well in metrics of equality, these differences were 4.5 and 4.2 for men and women, respectively. The Dutch Central Bureau of Statistics (CBS, 2016) estimates a difference of quality-adjusted life expectancy at birth of 18.7 years for men and 19 years for women. Such differences in health measures by socioeconomic status are not only found in the Netherlands or Europe, but can be found nearly everywhere (WHO, 2015). Moreover, besides being present far and wide, these gradients are persistent and widening over time (Hu et al., 2016). This implies that without intervention, the inequalities between those who are relatively well off and those who are relatively worse off will only become a larger problem in the future.

The phenomenon of the social gradient is an interesting and important one for researchers and those who work in policy. With knowledge of the exact sizes and causes of the gradient, policy makers can better understand and tackle the problems caused by it, increasing both the efficiency and effectiveness of government programs that aim to alleviate discrepancies between the less and more fortunate. Government programs focusing on decreasing the social gradient have been seen in the Netherlands (Mackenbach & Stronks, 2002), in the United Kingdom (Department of Health, 2010), as well as in other countries.

This paper aims to examine the causes for a particular type of social gradient – the education gradient – in the Netherlands. The focus will be on health behaviours, or more specifically, the effect educational attainment has on health through certain health behaviours. This will be done using data obtained from the LISS panel. The research question asks whether the education gradient can be fully explained away by improved decisions regarding health. To answer this question, several steps will be followed. First, a simple regression is run to see whether the education gradient is apparent in the data. Were this not to be the case, further analysis regarding the education gradient would be pointless. Furthermore, if the effect of educational attainment on health were to be explained away by improved health decisions, education should have an effect on health decisions, too. Therefore multiple regressions will be run to analyse the effect education has on health behaviours. Finally, having found both an effect of education on health, as

well as an effect of education on health-related behaviours, a last regression will be run to see whether the latter explains the former.

The rest of the paper is structured as follows. Section 2 discusses the literature regarding the education gradient and health behaviours. Section 3 describes the data and key variables used in this research. Section 4 explains the econometric methods employed to answer the research question. Section 5 presents and interprets the results. Section 6 discusses the results and possible missing variables. Section 7 concludes.

2 Literature Review

2.1 Education and health

A relation between education and health has been much discussed in the literature (Stringhini et al., 2010; Marmot & Bell, 2012; Gallo et al., 2012). Hartog & van Oosterbeek (1998) is one of the papers that looked at the education-health gradient in the Netherlands. They used a dataset from the Dutch province North Brabant, the so-called Brabant survey. This dataset surveyed sixth-grade pupils on information regarding school and family in 1952. Later, in 1983 and 1993, these respondents were interviewed again to see how their lives had turned out. Hartog and van Oosterbeek used an ordered probit model to evaluate the effect of educational attainment on health. Their results showed that education has a positive and significant effect on health.

Cutler and Lleras-Muney (2006) assessed theories and studies regarding the education gradient. They employed data from the National Health Interview Survey (NHIS) in the United States, which they matched with information from the National Death Index. In this way, they were able to calculate the effect of education on mortality. They found that better educated individuals were less likely to die within 5 years. Moreover, looking at morbidity, they showed that better educated people were less likely to suffer from the most acute and chronic diseases.

Besides correlations between education and health, some papers have also looked at the causal effects of education on health. Van Kippersluis, O'Donnell and van Doorslaer (2011) have looked into the long-run effects of schooling using a compulsory schooling law implemented in the Netherlands in 1928. Using a Regression Discontinuity Design (RDD) they were able to check the difference between those individuals who finished school right before the law was introduced, and were thus not affected, and those individuals who were affected by the reform. They found a small but significant effect on life expectancy for those who survived until 81 years old.

Not only have these education gradients been discussed in many papers, their development has also been analysed (Mol et al., 2002; Meara, Richards, & Cutler, 2008; Mackenbach et al., 2008). Dalstra et al. (2002) investigated the trend in health inequalities

by educational attainment. Looking at the Netherlands in the period of 1981 until 1999, they found that inequalities in health diminished in none of their specified indicators, but substantially increased in the case of self-reported health. Kunst et al. (2005) looked at a similar time period (1980s and 1990s) and found comparable results.

2.2 Education and health behaviours

To get a clearer picture as to why these inequalities in health by education exist, one might look into the determinants of health. Laaksonen et al. (2005) is a paper that analysed inequalities in smoking by socioeconomic status in Finland. It found that smoking is more prevalent in less educated individuals and decreases with educational attainment. Nagelhout et al. (2012) looked at the Netherlands and found that there is a demonstrable inequality in smoking with better-educated individuals smoking less. Moreover, they found that this inequality had increased between 2001 and 2008. The gap in amount of cigarettes smoked between the more and less educated widened, and more educated Dutch women were less likely to start smoking and more likely to quit during this period compared to their less educated peers.

The consumption of fruit and vegetables is also affected by the level of educational attainment (Lindström et al., 2001). A paper from 2000 reviewed the socioeconomic difference in this consumption for 7 countries (De Irala-Estevéz et al., 2000). The authors found that individuals with a higher education ate more fruit and vegetables, and ate healthier in general than the less educated. Moreover, Sobal and Stunkard (1989) reviewed the relationship between education and obesity and found that obesity decreased with education for women in developed societies, while for men the effect was inconsistent. Furthermore, Zhang and Wang (2004) found a relative difference in obesity prevalence between three different education groups (low, medium and high) of 50% in 1970 and 14% in 2000, with the prevalence rating decreasing more for women than for men.

Van Oers et al. (1999) used a survey done in Rotterdam to look at the relationship between socioeconomic status, alcohol use, and alcohol-related problems. They found that better-educated men and women were less likely to abstain from drinking alcohol. However, they were also less likely to drink excessively, which is more likely to be harmful than frequent drinking.

3 Data and key variables

3.1 LISS data panel

This paper uses data received from the LISS data panel. The LISS panel is a representative sample of Dutch individuals who participate in monthly Internet surveys. The panel is based on a true probability sample of households drawn from the population register. Households that could not otherwise participate are provided with a computer and Internet connection. A longitudinal survey is fielded in the panel every year, covering a large variety of domains including work, education, income, housing, time use, political views, values and personality.

After deleting entries that were non-responsive or incomplete, 5408 respondents were left. The answers to the survey questions are either categorical or continuous. The variables used in the research will be described below.

3.2 Key variables

3.2.1 Health

To get started with analysing the relation between education and health, these two terms need to be defined first. Two health measures are commonly used in the literature. One measure is mortality. One can calculate the difference in years lived that comes from attaining higher education. Mortality is an objective measure of health, but data is hard to come by. An alternative way of defining health is by asking people how they would evaluate their own health (Idler & Benyamini, 1997; DeSalvo et al., 2005). This self-assessed health measure is what will be used in the paper. Participants were asked to rate how they evaluated their own health on a scale ranging from 1 (poor) to 5 (excellent).

3.2.2 Education

Education can also be defined in multiple ways. Here too, the literature is split in two measures. The less common measure is the one using years of schooling. This measure establishes a linear relationship between education and health. The second and more common measure is educational attainment. In the Netherlands pupils are separated into heterogeneous classes at the early age of 12. These classes are very different in terms of level and topics, making it hard to justify comparing pupils merely on the years spent in school. Therefore, the second measure will be used to define education in this research. This method should give more insight in the health gains from different levels of education.

For educational attainment six different categories will be used. In order, these are primary school (1), VMBO (preparatory secondary vocational education, 2), HAVO/VWO (general secondary education, 3), MBO (senior secondary vocational education, 4), HBO

(higher professional education, 5) and WO (research-oriented education, 6). However, as these categories are different in what and whom they teach, effects on health may not be increasing in this particular order. For example, an MBO-education is generally more practical and specialized, whereas the HAVO/VWO-educations are broader and more technical.¹

3.2.3 Health behaviours

To see whether education affects health through affecting behaviours that are related to health, it is necessary to look at these health-relating behaviours. One behaviour that might immediately jump to mind is smoking. Smoking is detrimental to one's health and might be affected by one's level of educational attainment. Two binary variables are included for smoking; ever-smoker and current smoker. This way, not only the current damage of smoking is seen, but also the damage that has been done in the past.

Furthermore, alcohol can also be very damaging to the body. Two dummy variables are included to check for this. One is a continuous variable ranging from 1 (no drinks in the last year) to 8 (drink almost daily). The other is a dummy variable for those who drink at least five times per week.² Other health behaviours included are the consumption of fruits and vegetables. These continuous variables range from 1 (never) to 6 (every day). The frequency of exercise is added as a continuous variable defined as the amount of days in a week an individual exercises. Overeating is a behaviour relating to health that has become more prevalent in developed countries over the last few decades. To see how healthy eating varies with education, two binary variables are included; one for having a healthy BMI and one for being obese.

3.2.4 Control variables

Additionally, two control variables, which might affect the health status of the recipient, are added. These are age and gender. People's bodies respond differently to certain damages at different ages. As such, a difference in the population distribution of the education samples might skew the results. Similarly, the ability to sustain damage from negative health behaviours differs between men and women, and is thus controlled for. Gross income is deliberately left out as including it might lead to issues related with the education variables. As gross income was affected by education at the time of the survey, including it would bias the coefficients of the education variables, diminishing their reliability.

¹ For an in-depth explanation of the Dutch education system, see (EP-Nuffic, 2011).

² The largest problem with alcohol use is excessive drinking, not frequent drinking. However, due to a large number of nonrespondents, the data for amount of alcohol consumed could not be used.

3.3 Summary statistics

Table 1 presents the descriptive statistics. It shows the characteristics of the respondents for each education level. From the table several differences between the education levels can be noted. The average age per education shows no clear pattern, and over the total sample the average age of the respondents was close to 51 years old. A majority of the respondents was female, except among those with a university degree. While currently women are more likely to continue studying than men, this has not always been the case,

Table 1. Descriptive statistics

	Primary	VMBO	HAVO/VWO	MBO	HBO	WO	Full sample
Number	263	1228	644	1362	1312	599	5408
<i>Control variables</i>							
Age	52.47	58.22	43.74	48.78	51.94	45.44	50.9
Female	55.89%	60.34%	57.61%	50.22%	51.52%	45.43%	53.46%
<i>Health</i>							
Poor	3.42%	2.28%	1.24%	0.88%	0.99%	1.34%	1.44%
Moderate	28.52%	21.42%	12.89%	15.49%	13.19%	9.35%	15.92%
Good	46.39%	60.50%	55.28%	62.19%	59.60%	50.75%	58.32%
Very Good	13.31%	12.13%	23.60%	17.11%	21.57%	30.38%	19.12%
Excellent	8.37%	3.66%	6.99%	4.33%	4.65%	8.18%	5.20%
Mean	2.95	2.93	3.22	3.09	3.16	3.35	3.11
<i>Health behaviours</i>							
Smoked ever	58.17%	65.64%	48.29%	60.50%	53.66%	42.90%	56.49%
Smoked still	18.25%	21.17%	16.77%	21.66%	12.80%	11.18%	17.49%
Alcohol	3.82	4.47	4.65	4.56	4.99	5.13	4.68
Freq. alcohol	12.55%	21.82%	17.55%	18.21%	25.30%	22.70%	20.89%
Healthy BMI	37.64%	39.66%	57.76%	43.39%	50.15%	58.60%	47.30%
Obesity	17.87%	20.03%	11.18%	15.42%	11.74%	7.18%	14.28%
Fruit	4.56	4.72	4.68	4.54	4.92	4.91	4.73
Vegetables	4.56	4.59	4.89	4.65	4.95	5.21	4.80
Exercise	2.40	2.67	3.29	3.01	3.11	3.49	3.01

and with the average age being 50.9 years old, we can see the difference between generations in terms of higher educational attainment by gender.

In terms of health we see a large difference between the most and the least educated. The mean of self-assessed health was 3.35 for WO and 2.95 for primary, a discrepancy of 0.40. Of the most educated, nearly 90% assessed themselves to be healthy (answering good, very good or excellent), while the lowest category only did so in 68% of the cases. However, the rate of reporting ‘excellent’ was the highest among the primary education category (8.37%). Either people with primary education were indeed the healthiest in the sample, or this might be due to overconfidence.

Looking at individual behaviours relating to health, the most educated group smoked the least (11.18%) and had the highest percentage of respondents who had never smoked in their life (57.10%). Among the other categories, smoking appears to be decreasing with education. Alcohol, on the other hand, seems to be increasing with education. The most educated drank the most frequent and the lowest category drank the least frequent, with a discrepancy between the two of 10.15%. However, from these statistics we cannot tell which category is more likely to drink excessively. Furthermore, a clear pattern can be seen for healthy BMI and the rate of obesity. The percentage of respondents within a category with a healthy BMI increases with educational attainment, and the inverse happens for obesity. Both fruit and vegetables are consumed more often by those with higher rather than lower education. Similarly, more educated individuals exercise more often, too. Lastly, the rate at which individuals identify themselves as having a long-standing disease or handicap decreases with educational attainment.

4 Methodology

To answer the research question posed in the introduction, the data will be analyzed in the following section. Here the research methods for this analysis will be discussed.

The first step is to check whether the health gradient is apparent in the data. To do this, an ordered logistic regression is run. This regression is specified as follows:

$$Health_i = \beta_1 VMBO_i + \beta_2 HAVO/VWO_i + \beta_3 MBO_i + \beta_4 HBO_i + \beta_5 WO_i + \beta_6 X_i + \varepsilon_i$$

where the dependent variable $Health_i$ is the self-assessed health of person i , $VMBO_i$ up to WO_i are dummy variables for the educational attainment of person i , and X_i is a cluster of control variables consisting of the age and gender of person i . In the case that all levels of educational attainment are 0, person i has primary school as their highest education. The dummy variables for education are tested for joint significance. If these dummies are jointly significant, it can be said that there is a health gradient present in the data.

Furthermore, for our research it would be interesting to see if educational attainment has an effect on specific health behaviours. Nine separate equations are run, and depending on the health behaviour, are either a logit or an OLS regression. These equations will look like:

$$\begin{aligned} \text{Health Behavior}_i & \\ &= \beta_0 + \beta_1 \text{VMBO}_i + \beta_2 \text{HAVO/VWO}_i + \beta_3 \text{MBO}_i + \beta_4 \text{HBO}_i + \beta_5 \text{WO}_i + \beta_6 X_i \\ &+ \varepsilon_i \end{aligned}$$

where *Health Behavior_i* is one of the following: ever-smoked, smoke now, alcohol consumption, frequent alcohol consumption, fruit consumption, vegetable consumption, healthy BMI, obesity, or exercise disease for a given person *i*. Here too, the education dummies are tested jointly to check if education has a significant effect on health.

Lastly, to see if the effect of education on health can be explained by its effect on health behaviours; the final regression will include all variables. By gradually adding health behaviours, the regression will be formulated as:

$$\begin{aligned} \text{Health}_i &= \beta_1 \text{VMBO}_i + \beta_2 \text{HAVO/VWO}_i + \beta_3 \text{MBO}_i + \beta_4 \text{HBO}_i + \beta_5 \text{WO}_i + \beta_6 \text{ever - smoke}_i \\ &+ \beta_7 \text{smoke now}_i + \beta_8 \text{alc}_i + \beta_9 \text{freq. alc}_i + \beta_{10} \text{fruit}_i + \beta_{11} \text{vegetables}_i + \beta_{12} \text{HBMI}_i \\ &+ \beta_{13} \text{obesity}_i + \beta_{14} \text{exercise}_i + \beta_{15} \text{l. s. disease}_i + \beta_{16} X_i + \varepsilon_i \end{aligned}$$

The health behaviours are added in two groups before all being included in the final regression. This way one gets a more informed idea of how including specific health behaviours affect the education coefficients. As some behaviours are expected to be correlated, for example drinking and smoking, adding them separately would not provide an accurate picture. Furthermore, if by including all health behaviours the education dummies are no longer jointly significant, it can be said that the effect of education on health is explained by the effect of education on the health behaviours.

5 Results

The outcomes of the regressions mentioned in the previous section can be found in Tables 2 and 3. In Table 2, the first column displays the coefficients and corresponding standard errors of model 1, in which only the levels of educational attainment and the two control variables are included. Besides VMBO, all categories of education are individually significant at the 1% level. Moreover, the five education variables are jointly significant, meaning that there indeed exists an education gradient within the data. Individuals with better education are more likely to rate themselves to have good health relative to their less educated peers. Note however that the coefficients should not be read in a similar way

to those of OLS regressions, as the ordered logistic regression shows the coefficients for log-odds. Nonetheless, education affects health in the way it was predicted it would.

Table 3 presents the results for the effect of educational attainment on health behaviours. The first four columns include the behaviours with continuous variables, whereas the last five show those with binary variables. HBO and WO are individually significant in all instances. The education variables are jointly significant in all cases. Only in the cases of the two alcohol variables do the effects not necessarily favour the most educated, as the frequency of alcohol consumption increases with education.

In models 2, 3 and 4 of Table 2 the effects of educational attainment can be seen with health behaviours included. As health behaviours are added, the coefficients for the education variables decrease clearly. All but HBO and WO lose their individual significance. Regardless, the education variables remain jointly significant in model 4 ($p=0.0306$). It can thus be said that the health behaviours affected by education are not the full explanation of the education gradient.

Table 2. Results from ordered logistic regressions

	Model 1	SE	Model 2	SE	Model 3	SE	Model 4	SE
<i>Educational attainment^a</i>								
VMBO	0.211	(0.136)	0.175	(0.137)	0.184	(0.137)	0.161	(0.137)
HAVO/VWO	0.555***	(0.147)	0.380***	(0.148)	0.353**	(0.147)	0.233	(0.149)
MBO	0.320**	(0.135)	0.233*	(0.136)	0.244*	(0.136)	0.185	(0.137)
HBO	0.624***	(0.136)	0.439***	(0.137)	0.416***	(0.136)	0.289**	(0.138)
WO	0.921***	(0.148)	0.659***	(0.151)	0.623***	(0.150)	0.443***	(0.152)
<i>Controls</i>								
Age	-0.031***	(0.002)	-0.032***	(0.002)	-0.032***	(0.002)	-0.032***	(0.002)
Gender	-0.253***	(0.054)	-0.182***	(0.055)	-0.379***	(0.056)	-0.308***	(0.057)
<i>Health Behaviours</i>								
Smoke ever			-0.355***	(0.065)			-0.295***	(0.065)
Smoke now			-0.373***	(0.079)			-0.364***	(0.081)
Alcohol use			0.187***	(0.019)			0.151***	(0.019)
Frequent alcohol use			-0.374***	(0.098)			-0.336***	(0.099)
Healthy BMI					0.367***	(0.060)	0.354***	(0.061)
Obesity					-0.592***	(0.084)	-0.548***	(0.085)
Fruit consumption					0.135***	(0.022)	0.111***	(0.023)
Vegetables consumption					0.077***	(0.025)	0.060**	(0.026)
Exercise					0.070***	(0.011)	0.066***	(0.011)

^a Compared to attaining only primary school diploma

* $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$

Table 3. Results educational attainment and health behaviours

	Ordinary least squares regressions				Logit regressions				
	Fruit	Vegetables	Exercise	Alcohol	Freq. alcohol	Smoke ever	Smoke still	HBMI	Obesity
<i>Control variables</i>									
Age	0.019*** (0.001)	0.007*** (0.001)	-0.007*** (0.002)	0.029*** (0.002)	0.053*** (0.003)	0.031*** (0.002)	-0.014*** (0.002)	-0.022*** (0.002)	0.014*** (0.002)
Female	0.461*** (0.035)	0.392*** (0.031)	0.220*** (0.069)	-0.772*** (0.056)	-0.481*** (0.073)	-0.307*** (0.058)	-0.256*** (0.073)	0.270*** (0.057)	0.164** (0.080)
<i>Educational attainment^a</i>									
VMBO	0.037 (0.086)	-0.032 (0.077)	0.302* (0.171)	0.519*** (0.139)	0.740*** (0.210)	0.150 (0.148)	0.300* (0.177)	0.221 (0.145)	0.079 (0.178)
HAVO/VWO	0.283*** (0.093)	0.376*** (0.083)	0.830*** (0.184)	1.093*** (0.150)	1.037*** (0.229)	-0.160 (0.158)	-0.202 (0.194)	0.670*** (0.156)	-0.420** (0.207)
MBO	0.076 (0.086)	0.130*** (0.076)	0.603*** (0.169)	0.805*** (0.138)	0.937*** (0.213)	0.186 (0.146)	0.179 (0.174)	0.197 (0.143)	-0.089 (0.180)
HBO	0.387*** (0.086)	0.443*** (0.076)	0.717*** (0.169)	1.153*** (0.138)	1.218*** (0.210)	-0.204 (0.146)	-0.414** (0.181)	0.544*** (0.144)	-0.455** (0.184)
WO	0.529*** (0.094)	0.735*** (0.084)	1.076*** (0.186)	1.428*** (0.152)	1.351*** (0.228)	-0.483*** (0.160)	-0.670*** (0.207)	0.772*** (0.157)	-0.898*** (0.228)
Constant	3.312*** (0.098)	3.989*** (0.087)	2.614*** (0.193)	2.737*** (0.158)	-5.025*** (0.267)	-1.089*** (0.165)	-0.691*** (0.195)	0.462*** (0.161)	-2.394*** (0.221)

^a Compared to attaining only primary school diploma

Standard errors in brackets

* p < 0.1, ** p < 0.05, *** p < 0.01

6 Discussion

The results show that health behaviours are not the sole explanation as to why education affects health. This leaves two interesting issues. The first is the issue of explaining the residual effect. If the effect of education on health behaviours does not explain away the effect of education on health, then the question arises of what does explain this correlation. Either getting the higher degree itself leads to a higher health evaluation, or there are certain variables left out that explain this correlation. However, it is unlikely that schooling directly affects health instead of through a certain pathway. This makes it reasonable to assume the latter. The second issue is the correlation between education and health behaviours. From the results it can be seen that a part of, but not all, the education gradient is explained by the health behaviours. Education significantly affects health behaviours in all dimensions, though the sign of the association is not as expected for drinking. However, the underlying reasons for these correlations are unclear. These two issues should shine some light on the association between education and health and will be discussed below.

A variable that is missing in the research that could potentially explain the leftover effect of education on health is family background. Conti, Heckman & Urzua (2010) find that health disparities at age 30 can be predicted to some extent from age 10 using the important predictor family background. Currie (2009) finds similar results. She finds a significant correlation between parent's educational attainment and child health, and between child health and future health outcomes. Healthy parents are able to bestow their children with healthy genes. Not only does this affect their health later in life, it also affects educational attainment, as healthier children perform better in school (Case, Fertig, & Paxson, 2005). As a proxy for family background, height was temporarily added to regressions in the preliminary analysis of this paper's research, but was found to lack explanatory power. Either the variable for height was a lacking predictor for family background, or family background had little to no effect on health in the data.

Another variable that is missing is personal or household income. In Section 3 it was mentioned that including such a variable would lead to biased estimates of the education coefficients, and was subsequently left out. Nonetheless, income could explain why education affects health besides the effect through health behaviours. First of all, better-educated individuals often have jobs that come with safer work environments and better health insurance. Moreover, income increases with education, and higher income gives individuals the option of investing more in health (Cutler & Lleras-Muney, 2006). For example, one may decide to spend more on health insurance or healthier food.

The second issue is that of underlying reasons for the existing association between education and health behaviours. The inclusion of these variables explains a portion of the education gradient, but why this is the case remains unclear. In the literature several

possibilities are mentioned as to what could link better education to improved decisions regarding health. One such possibility is that better-educated individuals have gained skills which are helpful in preventing diseases. Critical thinking is an example; better-educated individuals may be better at understanding health risks. Furthermore, health literacy has been shown to increase with education (Paasche-Orlow et al., 2005).

Time preference is another possible link between education and health behaviours. An individual with a lower discount rate values the future more. This would lead to increased investments in both education and health. However, the discount rate is hard to measure, and therefore little research has been done on its relation with education and health. Berger and Leigh (1989) suggest that the association between education and health stems from a direct effect of schooling, and not the effect of unobserved third variables such as time preference.

7 Conclusion

The analysis shows that there is a large effect of education on health. Including health behaviours greatly reduces this effect, but does not eliminate it completely. This finding is in line with the literature on the education gradient. Dutch individuals with at least a university degree are shown to be the healthiest individuals in the Netherlands, with around 90% of them stating their health to be good or higher. However, the underlying reasons as to why they are the healthiest are much debated. Moreover, the research comes with a few limitations. Firstly, all data are self-reported and may thus not be entirely objective. Secondly, some variables used are suboptimal, i.e. the author regrets not having complete data on the size of consumption of smoking, alcohol, fruits, and vegetables. Further research is necessary to clearly outline all of the intermediate variables that play a role in the education gradient in health.

Finally, let's move our focus towards policy implications. The fact that the most educated perform better in both health and health behaviour means that there is room to improve for those who are less educated. Mackenbach and Stronks (2002) discuss research into health inequalities undertaken by the Dutch Ministry of Health at the end of the 20th century. They advise targeting those families at the lower end of socioeconomic status and helping them from a young age, as well as providing disadvantaged individuals with more support, e.g. by helping them get paid employment and improving health-related knowledge. Investments in controlling negative health behaviours as well as improving educational attainment for those from lower socioeconomic backgrounds should be able to significantly diminish the health inequalities that exist in the Netherlands today.

8 Bibliography

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