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Wealth and health behavior: Testing the concept of a health cost

Hans van Kippersluis [a,b,*], Titus J. Galama [c,d]

[a] Erasmus School of Economics, Erasmus University Rotterdam (EUR), PO Box 1738, 3000 DR Rotterdam, The Netherlands
[b] Tinbergen Institute, The Netherlands
[c] University of Southern California, Dornsife College Center for Economic and Social Research, 635 Downey Way, Los Angeles, CA 90089-3332, USA
[d] RAND Corporation, USA

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ABSTRACT

Wealthier individuals engage in healthier behavior. This paper seeks to explain this phenomenon by exploiting both inheritances and lottery winnings to test a theory of health behavior. We distinguish between the direct monetary cost and the indirect health cost (value of health lost) of unhealthy consumption. The health cost increases with wealth and the degree of unhealthiness, leading wealthier individuals to consume more healthy and moderately unhealthy, but fewer severely unhealthy goods. The empirical evidence presented suggests that differences in health costs may indeed partially explain behavioral differences, and ultimately health outcomes, between wealth groups.

1. Introduction

Unhealthy lifestyles and unhealthy consumption are more prevalent among the poor, and account for a large fraction of the substantial socioeconomic disparities in health (Contoyannis and Jones, 2004; Cutler et al., 2011). More affluent individuals are less likely to smoke, drink heavily, be overweight, and use illegal drugs, and are more likely to exercise and engage in preventive care (e.g., Cutler and Lleras-Muney, 2010; Cutler et al., 2011; Cawley and Ruhm, 2012). A phenomenon of particular interest is that richer people tend to engage more in some unhealthy behaviors, such as drinking moderately,[1] but less in other unhealthy behaviors, such as smoking and excessive alcohol consumption (Cutler and Lleras-Muney, 2010; Cawley and Ruhm, 2012; see also Table 1).[2] What explains these differences in health behaviors across wealth groups remains largely unclear (Cutler et al., 2011).

* Corresponding author at: Erasmus School of Economics, Erasmus University Rotterdam (EUR), PO Box 1738, 3000 DR Rotterdam, The Netherlands. Tel.: +31 10 4088837.
E-mail addresses: hvankippersluis@ese.eur.nl (H. van Kippersluis), galama@usc.edu (T.J. Galama).

[1] Some studies suggest that drinking moderately may be beneficial to one's health (e.g., Fuller, 2011).

[2] Cawley and Ruhm (2012) report a negative association with income for smoking, no association for heavy drinking (defined as averaging > 14 drinks per week during the last year for males [> 7 for females]), no association for binge drinking (5 or more drinks during a single day at least once in the last

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Table 1
Descriptive statistics of the dependent and independent variables, for the full sample and for subgroups.

Outcome	Full sample	Most healthy most wealthy	Most healthy least wealthy	Least healthy most wealthy	Least healthy least wealthy
HRS					
Log household wealth	12.71	13.46	11.88	12.88	10.84
Log amount inherited	10.59	10.91	10.22	10.62	9.93
Relative amount inherited (%)	11.97	7.77	18.90	10.42	40.25
Log food expenditures	4.64	4.86	4.62	4.70	4.37
Smoking (%)	15.84	10.61	17.60	13.79	21.61
Log number of cigarettes	2.18	2.16	2.19	2.18	2.17
Drinking (%)	49.60	66.97	51.38	48.26	31.57
Log number of drinks	1.04	1.17	1.01	0.97	0.88
Heavy drinking (%)	14.14	10.18	13.84	12.29	17.56
Physical activity	3.65	3.91	3.76	3.57	3.34
Number of observations	153,024	38,272	37,173	39,968	37,611
BHPS					
Log imputed household wealth	10.78	11.88	9.97	11.06	8.64
Log household income	10.13	10.45	9.88	10.23	9.63
Log amount won	3.70	3.73	3.73	3.60	3.66
Log amount won (big win)	7.33	7.39	7.30	7.26	7.26
Relative amount won (%)	0.08	0.03	0.20	0.06	0.69
Relative amount won (big win, %)	2.07	0.86	5.08	1.08	27.80
Log food expenditures	3.20	3.58	3.09	3.19	2.51
Smoking (%)	26.07	16.31	31.22	24.33	40.81
Log number of cigarettes	2.39	2.20	2.42	2.37	2.57
Drinking out	3.21	3.43	3.24	3.09	2.76
Sports	3.78	4.14	3.84	3.58	3.01
Number of observations	165,488	60,912	55,945	23,710	24,281

Notes: Author's calculations on the basis of the 1992–2010 HRS and 1997–2008 BHPS. Note that log household wealth and log household income are calculated on the basis of the sample of inheritance recipients (HRS) or lottery winners (BHPS). Relative amounts are calculated as the ratio of exp(log amount won)/exp(log household wealth).

Theoretical models of consumption and saving have difficulty explaining differences in unhealthy consumption across wealth groups. In these models, wealth enables more consumption, and the quantity purchased is governed by the monetary price of the good, permanent income and wealth, as well as preferences. Unless preferences differ substantially, these models would predict that wealthier individuals would engage more, not less, in unhealthy consumption.

In this paper we empirically evaluate a theory of health behavior (Galama and van Kippersluis, 2010) that provides a potential explanation for the observed differences in consumption patterns across wealth groups. The theory highlights the importance of a "health cost" of unhealthy behavior in explaining differences in health behavior between groups. To test the theory, we generate theoretical predictions of the effect of wealth shocks on health behavior, exploit both inheritance receipts and lottery winnings as plausibly exogenous variation in wealth, investigate heterogeneity in the effects of wealth shocks on health behavior across wealth and health groups, and employ the theory to interpret the empirical results. The paper contributes to three literatures: the literature on health behaviors, the literature on health disparities, and the literature relating to the value of life.

We present a theory based upon Galama and van Kippersluis (2010).[3] The model builds on the human capital theory of the demand for health investment (Grossman, 1972) with two important extensions. First, we use a health production process that is subject to diminishing returns to scale. This addresses the degeneracy of the solutions for investment and health (see Ehrlich and Chuma, 1990; Galama, 2011) that characterizes commonly employed linear investment models.[4] It is further attractive in that the health investment process is generally thought of as being subject to diminishing returns (Wagstaff, 1986). Second, we explicitly model the effect of consumption on health through its effect on the health deterioration rate. We distinguish healthy consumption (such as the consumption of healthy foods, sports and exercise) from unhealthy consumption (such as smoking, excessive alcohol consumption). Healthy consumption provides utility and

(*footnote continued*)
year), and a positive association with physical activity. Cutler and Lleras-Muney (2010) find a negative association with education (a useful proxy for permanent income, life-time wealth) for smoking, for being obese, and for heavy drinking, and a positive association for moderate levels of drinking and for physical activity.

[3] The theory focuses on health investment and healthy/unhealthy consumption, but leaves out the role of time inputs, working conditions, longevity, and retirement.

[4] To recall the definition, in mathematics, a degenerate case is a limiting case in which a class of solutions changes its nature so as to belong to another, usually simpler, class. A degenerate case thus has special features, which depart from the properties that are generic in the wider class, and the nature of the degenerate solution is generally lost under a small perturbation of the degenerate system. See Galama (2011) and Galama and Van Kippersluis (2013) for additional detail.