HUMAN CAPITAL AND HEALTH BEHAVIOR

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INTRODUCTION

Human capital is capital embodied in human beings. It embraces the individual's capacity to perform and enjoy activities that provide money and/or psychic income. Human capital can be augmented by investing in education, health, and social networks to name a few of the most important ones. A principal characteristic that distinguishes investments in human capital from other kinds of capital is that the presence of the individual is required; the individual's own time is essential in the production of new human capital. Health behavior affects human capital and is itself affected by the individual's human capital. Human capital has been a main issue for economic research since the late 1950s and early 1960s (see, for instance, Becker, 1962; Mincer, 1958; Mushkin, 1962; Weisbrod, 1962). The publication of the demand-for-health model (Grossman, 1972a, 1972b) raised an interest among economists for the interdependence between human capital and health behavior. It has been in focus for economic research ever since. This volume presents new research on the topic: five sections including eight original theoretical and empirical contributions.

The first section is devoted to *Prenatal Investments and Human Capital Development*. In previous research, the time between adjacent births has been shown to affect educational outcomes. In the first chapter, "Birth Spacing and Educational Outcomes," Elaine L. Hill and David J. G. Slusky test the relationship, using birth certificates and schooling outcomes data from Colorado, USA. They find no overall effect of spacing, but by stratifying by sexes, they find that when the first child is a boy and the second a girl, an extra year of spacing will increase the first child's math, reading, and writing test scores by 0.07−0.08 standard deviations. No impact on the second child is found.

A positive correlation between schooling and health has been found in several empirical studies. It is still debated, however, whether the causal link goes from schooling to health, from health to schooling, or from factors that influence both entities in the same direction. The relationship between *Education and Health* is the content of the second section, which includes two papers. In their theoretical paper, "Individual Investments in Education and Health: Policy Responses and Interactions," Jared C. Carbone and Snorre Kverndokk formulate a model, in which the individual chooses how much to invest in education and health as well as how much to work, consume, and

save throughout adult life. Using the model, they study the impact on individual decisions of various policy measures. According to their results, income redistribution policies may be the best instrument to improve individual welfare, while a health-care subsidy is the best policy instrument for individual longevity. The result follows, among other things, from the assumption that health is not the only item in the individual's utility function. The relationship between education and health is also analyzed by Prabal K. De in his empirical paper, "Causal Effects of Maternal Schooling on Child Immunization in India." Employing a new instrument for women's education, age at menarche, his findings suggest a causal link that additional years of maternal schooling increase the probability of complete immunization of children.

The chapters "Effects of Maternal Work Incentives on Teen Drug Arrests" and "Behavioral Welfare Economics and FDA Tobacco Regulations" are devoted to *Human Capital and Risky Health Behavior*. Hope Corman, Dhaval Dave, Ariel Kalil, and Nancy E. Reichman investigate the "Effects of Maternal Work Incentives on Teen Drug Arrests." The goal of the 1996 Personal Responsibility and Work Opportunity Act and earlier state legislation in the United States (the "welfare reform") was to reduce dependence on cash assistance by promoting employment. Using monthly arrest data and exploiting differences in the implementation of the welfare reform across states and over time in the United States, the authors apply a difference-in-difference approach to estimate the effects for teens exposed to the welfare reform. Their results show no statistically significant effect of the welfare reform on teen drug arrests. In "Behavioral Welfare Economics and FDA Tobacco Regulations," Philip DeCicca, Donald Kenkel, Feng Liu, and Hua Wang develop a behavioral welfare economics model approach to measure the impact of FDA (the US Food and Drug Administration) tobacco regulation on consumer welfare. They conclude that, in the presence of uncorrected internalities and externalities, a nudge or a tax to reduce cigarette consumption will improve social welfare. A paternalistic regulation, on the other hand, will either improve or worsen social welfare. An important result is also that the social welfare gains depend not only on the size of the internalities and externalities but also on the extent to which current policies already correct the problems.

Information and Health Behavior is the topic for the fourth section, and it contains two chapters. In "Educational Heterogeneity in the Association between Smoking Cessation and Health Information," Dean R. Lillard investigates the educational gradient in smoking. Using longitudinal data on lifetime smoking histories, he explores whether the educational gradient changes, when individual differences in information are taken into account. To

calculate exposure, he predicts an individual's reading of particular magazines and link predicted exposure to data on individual smoking status in every year of life. His findings suggest that education affects whether and how health risk information induces people to quit smoking. In "The Effect of Education on Health Behavior after Screening for Colorectal Cancer," Eline Aas and Tor Iversen study the changes in the demand for health that may occur after cancer screening, in particular how these changes vary with educational human capital. The hypothesis is that individuals with low levels of educational capital may misinterpret a negative test result and initiate less preventive efforts more often than individuals with higher levels of educational capital. The analyses are based on a randomized controlled screening for colorectal cancer in Norway, comprising about 50,000 individuals, of which 21,000 were invited to participate in the screening. Changes in health-care utilization for lifestyle-related diseases after screening are used as a proxy for changes in health behavior. The authors find support for their hypothesis, since the change in health-care utilization for lifestyle-related diseases is smaller among individuals with a high level of educational capital.

The final section is about *Insurance and Health Behavior*. It contains one chapter, "Unemployment Insurance and Physical Activity," authored by Jonathan Cylus. Unemployment insurance reduces the opportunity cost of leisure. Cylus analyzes to which extent additional leisure time is physically active, using monthly data on habits from the Behavioral Risk Factor Surveillance System and the American Time Use Survey and exploiting changes in unemployment insurance programmes across US states and time. He finds that increases in unemployment insurance benefits coincide with greater probability of physical activity among the recently unemployed.

Thus, this volume brings together a coherent collection of studies on the various ways in which human capital affects health behavior and health behavior affects human capital. The studies contain topics and results of real importance in most health-related fields of policy-making.

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REFERENCES

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy*, *70*(5), 9–49. Part 2. Special supplement on Investment in Human Beings.

Grossman, M. (1972a). On the concept of health capital and the demand for health. *Journal of Political Economy*, *80*, 223–255.

Grossman, M. (1972b). *The demand for health: A theoretical and empirical investigation*. New York, NY: Columbia University Press for the National Bureau of Economic Research, Reissued by Columbia University Press, 2017.

Mincer, J. (1958). Investment in human capital and personal income distribution. *Journal of Political Economy*, *66*, 281–302.

Mushkin, S. J. (1962). Health as an investment. *Journal of Political Economy*, *70*(5), 129–157. Part 2. Special supplement on Investment in Human Beings.

Weisbrod, B. A. (1962). Education and investment in human capital. *Journal of Political Economy*, *70*(5), 106–123. Part 2. Special supplement on Investment in Human Beings.