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Volume Title: The Effect of Education on Efficiency in Consumption

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Volume Publisher: UMI

Volume ISBN: 0-87014-242-9

Volume URL: <http://www.nber.org/books/mich72-1>

Publication Date: 1972

Chapter Title: Introduction to "The Effect of Education on Efficiency in Consumption"

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Chapter URL: <http://www.nber.org/chapters/c3513>

Chapter pages in book: (p. 1 - 6)

**The Effect of Education
on Efficiency in Consumption**

Introduction

WITHIN THE PAST decade human capital has become a popular focus of study by economists. Its relevance for dealing with issues of economic growth, aggregate productivity, wage structure, and distribution of personal income is now unquestioned. Since human capital is viewed as an investment good, much attention has been turned to the returns accruing on that investment. Most of the research along these lines has dealt with the effect of the investment on an individual's market earnings.

While the increase in market earnings is surely one aspect of the returns on human capital (investment in formal schooling, on-the-job training, good health, information about markets, and so forth), there is no reason to suppose it is the only return on that investment. A distinguishing characteristic of human capital is that it is embedded in an individual and therefore accompanies him wherever he goes—into the labor market, into the theater, into the voting booth, and into the kitchen. If, therefore, human capital affects productivity and yields a stream of income in one of these—the labor market—it seems reasonable to expect it to have some effect on productivity in other activities as well. As T. W. Schultz once suggested, the general proposition on which the interest in human capital rests is that “people enhance their capabilities as producers and as consumers by investing in themselves.”¹ Yet in the literature very little attention has been paid to the effects of human capital on one's capabilities as a consumer or to its effects on productivity in activities outside the labor market. This study may be viewed as one of the attempts under way to fill this gap and to analyze and measure these nonmarket effects.

Clearly, the explanation for the imbalance in the study of nonmarket effects of human capital lies in the fact that no conceptual framework has been developed in which they may be analyzed. Fortunately, recent literature has suggested a new approach to consumption theory, which

¹Theodore W. Schultz, “Reflections on Investment in Man,” *Journal of Political Economy*, October 1962, supplement, p. 1.

can be used as a vehicle to study the nonmarket effects of human capital.² The theoretical model developed in this connection also appears to be useful in understanding some effects on behavior of numerous other factors, such as climate, political stability, population density, and so on.

The traditional theory of consumer behavior treats purchased goods as items directly entering the utility function of the consumer. When a good is purchased and consumed, the individual's utility is presumed to be enhanced. The new approach argues that the act of consumption is in fact a production activity, in which the consumer uses both market goods and his own time as inputs in the production of more basic desiderata called commodities. (For example, one uses a barber's services and some of one's own time to produce a groomed head of hair.) On the premise that purchased goods are not of direct utility to the consumer but are, rather, inputs used to produce commodities, the demand for market goods is a derived demand.³

Since this approach suggests that consumption involves a production process in the nonmarket sector, we may view human capital as affecting the efficiency of that process. Thus, the analytical tools of production theory may be applied to various aspects of consumption. An analytical framework in which these productivity effects of human capital may be viewed is outlined in the following chapters, which also develop certain implications for consumer behavior and report on empirical investigations of these implications.⁴

² See Gary S. Becker, "A Theory of the Allocation of Time," *Economic Journal*, September 1965; Kelvin Lancaster, "A New Approach to Consumer Demand," *Journal of Political Economy*, April 1966, and "Change and Innovation in the Technology of Consumption," *American Economic Review*, May 1966; and Richard Muth, "Household Production and Consumer Demand Functions," *Econometrica*, July 1966. This study most closely follows Becker's formulation.

³ For some items this approach has long been in vogue. Keynes's discussion of the demand for money in terms of precautionary, speculative, and transaction demand can be interpreted as involving three commodities that use cash balances in their production; the demand for insurance clearly results from the desire for some form of security that can be produced using the purchased insurance policy as an input. It is only a small step from there to suggest that the demand for lawn mowers is essentially a demand for a factor of production used to produce an attractive lawn, that the demand for a doctor's services is a derived demand used in producing good health, or that the demand for food is a derived demand used in producing nutritional requirements.

⁴ The theoretical model is one application of the household production function approach being explored at the National Bureau of Economic Research.

To summarize briefly: In the context of a set of household production functions, human capital is viewed as affecting the efficiency of the production process. By assuming Hicks-neutral productivity shifts, the effect of education on real income through nonmarket efficiency is examined, and it is suggested that changes in the level of education will lead to changes in the composition of the commodity basket. If education enhances nonmarket productivity, the consumption of commodities—and the expenditure on market goods—should shift toward luxuries. The empirical study investigates whether increases in education, *with money income fixed*, do in fact shift expenditure patterns in this manner.

The findings from several bodies of cross-sectional data reveal that the education level does affect expenditure patterns and generally does so in the expected manner, although in no sense perfectly coinciding with the predicted neutral shifts. Since the same items tend to be “non-neutral” in these various data and frequently tend to be so in the same direction, the effects of education appear to involve nonneutrality with respect to these items. From the coefficients estimated it is possible to infer something about the size of the contribution to real income from education’s nonmarket effect. Thus, the elasticity of consumption income with respect to education is estimated to be around $+0.10$ by one estimating technique and as high as $+0.75$ by another. These estimates are admittedly rough and are suggested as no more than “ball park” estimates.

The theoretical framework of this study appears useful for explaining observed behavior, but other explanations can, of course, be put forth, and several of these are discussed throughout. The advantage of the model developed here is its capability to predict most of the observed shifts in expenditure patterns without the need for ad hoc theorizing. Furthermore, it does so with no complicating assumptions beyond the general presumptions of technological neutrality and linear homogeneity. As to those expenditure shifts that are not as predicted, the model can be used to interpret them in terms of ordinary price

See, for example, Gary S. Becker, “The Allocation of Time and Goods Over Time,” NBER, June 1967, mimeo.; Gary S. Becker and Robert T. Michael, “On the Theory of Consumer Demand,” March 1970, mimeo.; Gilbert R. Ghez, “A Theory of Life Cycle Consumption,” Ph.D. dissertation, Columbia University, 1970; and Michael Grossman, “The Demand for Health: A Theoretical and Empirical Investigation,” NBER, forthcoming.

effects (although empirically these effects cannot, as yet, be dealt with). While the conclusion is tentative, the empirical work suggests that this model is a viable one and that it offers a reasonably consistent interpretation of the effects of education on consumer behavior. Given the exploratory nature of the study, the results are encouraging and suggest that this new approach to the nonmarket sector merits further consideration in future research.