Essays on the Application of Behavioral Economic Concepts to the Analysis of Health Behavior

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Thesis summary

In this thesis I apply the concepts of Behavioral Economics to the analysis of the individual health care behavior. In the first chapter I provide a theoretical explanation of the link between loss aversion and health anxiety leading to infrequent preventive testing. In the second chapter I analyze this link empirically based on the general population questionnaire study. In the third chapter I theoretically explore the effects of motivational crowding-in and crowding-out induced by external or self-rewards for the self-control involving tasks such as weight loss or smoking cessation.

Understanding psychological factors behind the reluctance to use preventive testing is a significant step towards a more efficient health care policy. Some people visit doctors very rarely because of a fear to receive negative results of medical inspection, others prefer to resort to medical services in order to prevent any diseases. Recent research in the field of Behavioral Economics suggests that human’s preferences may be significantly influenced by the choice of a reference point. In the first chapter I study the link between loss aversion and the frequently observed tendency to avoid useful but negative information (the ostrich effect) in the context of preventive health care choices. I consider a model with reference-dependent utility that allows to characterize how people choose their health care strategy, namely, the frequency of preventive checkups. In this model an individual lives for two periods and faces a trade-off. She makes a choice between delaying testing until the second period with the risk of a more costly treatment in the future, or learning a possibly unpleasant diagnosis today, that implies an emotional loss but prevents an illness from further development. The model shows that high loss
aversion decreases the frequency of preventive testing due to the fear of a bad diag-
nosis. Moreover, I show that under certain conditions increasing risk of illness discourages testing.

In the second chapter I provide empirical support for the model predictions. I use a questionnaire study of a representative sample of the Dutch population to measure variables such as loss aversion, testing frequency and subjective risk. I consider the undiagnosed non-symptomatic population and concentrate on medical tests for four illnesses that include hypertension, diabetes, chronic lung disease and cancer. To measure loss aversion I employ a sequence of lottery questions formulated in terms of gains and losses of life years with respect to the current subjective life expectancy. To relate this measure of loss aversion to the testing frequency I use a two-part modeling approach. This approach distinguishes between the likelihood of participation in testing and the frequency of tests for those who decided to participate. The main findings confirm that loss aversion, as measured by lottery choices in terms of life expectancy, is significantly and negatively associated with the decision to participate in preventive testing for hypertension, diabetes and lung disease. Higher loss aversion also leads to lower frequency of self-tests for cancer among women. The effect is more pronounced in magnitude for people with higher subjective risk of illness.

In the third chapter I explore the phenomena of crowding-out and crowding-in of motivation to exercise self-control. Various health care choices, such as keeping a diet, reducing sugar consumption (e.g., in case of diabetes) or abstaining from smoking, require costly self-control efforts. I study the long-run and short-run influence of external and self-rewards offered to stimulate self-control. In particular, I develop a theoretical model based on the combination of the dual-self approach to the analysis of the time-inconsistency problem with the principal-agent framework. I show that the psychological property of disappointment aversion (represented as loss aversion with respect to the expected outcome) helps to explain the differences in the effects of rewards when a person does not perfectly know her
self-control costs. The model is based on two main assumptions. First, a person learns her abstention costs only if she exerts effort. Second, observing high abstention costs brings disutility due to disappointment (loss) aversion. The model shows that in the absence of external reward an individual will exercise self-control only when her confidence in successful abstention is high enough. However, observing high abstention costs will discourage the individual from exerting effort in the second period, i.e. will lead to the crowding-out of motivation. On the contrary, choosing zero effort in period 1 does not reveal the self-control costs. Hence, this preserves the person’s self-confidence helping her to abstain in the second period. Such crowding-in of motivation is observed for the intermediate level of self-confidence. I compare this situation to the case when an external reward is offered in the first period. The model shows that given a sufficiently low self-confidence external reward may lead to abstention in both periods. At the same time, without it a person would not abstain in any period. However, for an intermediate self-confidence, external reward may lead to the crowding-out of motivation. For the same level of self-confidence, the absence of such reward may cause crowding-in. Overall, the model generates testable predictions and helps to explain contradictory empirical findings on the motivational effects of different types of rewards.