

# Behavioral Policy

Andrew Caplin and John Leahy

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## Abstract

Working together, economists and psychologists can develop new tools of policy analysis. These tools will allow researchers to get the best of both worlds: the behavioral richness of psychology and the policy relevance of economics. We illustrate the collaborative agenda in three different areas of application.

## 1 Introduction

Policy questions (such as when free trade among nations is beneficial) are central to economics. Economists have become very good at constructing models to address these questions. The models explicitly lay out the constraints on individual and social choice, the interactions among individuals, and the payoffs to each contingency. From this systematic reasoning comes a view of which policies are best. Economic models are often criticized as painting an idealized picture of the decision making process. Yet it is precisely this idealism that makes them so valuable for arriving at coherent policy decisions. By definition, incoherent policies please no one.

In answering policy questions, economists often make drastic simplifying assumptions on human behavior. These assumptions do not sit well with most psychologists, whose experiments reveal the many subtleties of human behavior. The psychological study of behavior is but one part of an even deeper analysis of cognition, motivation, and emotion. The intricacy of their research findings makes many psychologists see simple economic man as an irrelevant abstraction. Economists, for their part, worry that it will be very hard to derive useful policy lessons from intricate psychological experiments. Psychologists may miss the forest for the trees.

The richest possibilities for collaboration between psychology and economics lie where strength meets strength. Economists can bring to the table their rich tradition of policy analysis, psychologists their equally rich tradition of analyzing human behavior. We argue that just such a synthetic approach to behavioral policy is within grasp, and that the resulting synthesis will open up whole new areas of research.

We pose three sets of policy questions, and explain why joint research will be required to address them. We begin in section 2 by posing a question from the field of behavioral medicine: how much information should a doctor supply to a patient prior to an operation? This small question perfectly illustrates the need for collaborative research. We outline our own integrative model which incorporates key psychological insights into an economic framework, and thereby provides deeper insight into policy than can be gleaned from either field in isolation (Caplin and Leahy [1999]).

In the following sections we turn to two questions that figure to be among the most burning policy questions of our era. Section 3 addresses policy issues raised by the ever-expanding availability of genetic tests that can provide subjects with early warning of impending health problems. Section 4 addresses policy issues raised by the low U.S. savings rate. In both cases, we argue that progress in policy analysis requires inter-disciplinary collaboration along the lines outlined in section 2. We also point out some of the deep challenges that will be faced by those involved in inter-disciplinary research on such complex and long term questions as genetic testing policy and savings policy.

## 2 The Provision of Medical Information

A (male) patient is facing an up-coming surgical procedure. The (female) doctor knows a great deal more about the procedure and its outcome than does the patient. The doctor's policy question is how much information to pass on to the patient before the operation.

In the remainder of the section, we first outline the quick and easy answer to the policy question were the doctor to follow the dictates of standard economic theory, then the richer answer implied by psychological research, and finally the even richer answer offered by a synthetic approach. We close by pinpointing the critical differences between classical economic theory which is mute on the policy question, and the psychologically-oriented theory which provides many insights.

## 2.1 Economics

A central result of classical economic theory is Blackwell's theorem, which implies that more information can never be a bad thing. After all, the argument goes, information can only be an aid to planning, and if it is not an aid to planning it is simply irrelevant. Blackwell's theorem rests on the assumption that utility depends only on outcomes. Beliefs have no independent effect on well-being, but serve merely as weights by which to average possible outcomes. Since only external outcomes can be sources of utility, all forms of anxiety and fear, even fear of death, are treated as irrational.<sup>1</sup>

In the medical context, Blackwell's theorem trivializes the question information provision. If the information that the doctor possesses is important for some other decision by the patient (such as how soon after the operation he can go on vacation), then she should pass it on. If the information is not relevant to decisions, it has no value whatsoever, and so it may not be worth taking the time to convey it.

## 2.2 Psychology

While anxiety plays no role in standard economics, it features heavily in psychological research on the supply of medical information. Janis [1958] hypothesized that providing more information about an up-coming medical procedure would stimulate the "work of worrying" that would initially raise patient anxiety, but subsequently lower it and thereby speed recovery. The more recent literature has focused attention on how individuals differ in their response to information. It has been shown that additional information serves to raise anxiety in some patients and lowers it in others (e.g. Miller and Mangan [1983]).

Researchers in behavioral medicine have extracted a policy recommendation from this research. They propose using questionnaire techniques to identify whether or not an individual generally finds medical information anxiety-inducing or anxiety-reducing. They recommend supplying information to the latter, not to the former. Morgan et al. [1998] investigated precisely this strategy in the case of a colonoscopy, a short yet stressful surgical

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<sup>1</sup>Even Shakespeare's Caesar did not go quite this far. Being "brave", he agreed with modern day economists in finding fear of death hard to understand, "Seeing that death, a necessary end, Will come when it will come." Yet even he understood that the world contained many "cowards" who "die many times before their death".

procedure. They indeed found that whose questionnaire answers revealed a desire for information did better (in a wide variety of psychological and medical measures) if they received more information, while those who revealed a lack of desire for information did better if they received less information.<sup>2</sup>

## 2.3 A Synthesis

Despite appearances to the contrary, psychological research cannot answer the policy question without modeling help from economics. One key limitation of the experimental techniques of psychologists is that results are of necessity derived in the current policy environment. If the policy were to change, so would the emotional response to information, and with it the policy recommendation itself.<sup>3</sup> Absent a model, it is next to impossible to accommodate the policy implications of such complex spillover effects. Yet in principle these effects can be handled in a suitably structured model.

In general, models are necessary laboratories for the kind of counterfactual analysis required to investigate the impact of policy changes. They also allow one to broaden the scope of the analysis to cover additional questions such as whether or not the policy-recommendation for a colonoscopy generalizes to life and death operations. and whether or not the questionnaire should be enriched to include information on the patient's level of knowledge about the operation, and if so how such information should be used.

Our research program involves acknowledging the importance of psychological forces such as fear and anxiety, while retaining the model-building philosophy of economics. Our "psychological expected utility" model (henceforth PEU) treats these psychological forces as prizes of equivalent status to the physical prizes that dominate classical economic theory (Caplin and Leahy [1997]). Our work extends the ideas of Jevons [1905] and Loewenstein [1987] to settings with uncertainty.

In our model of how a doctor should supply information to a potentially

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<sup>2</sup>Further psychological research in this area will be need to deepen our understanding of patient anxiety. One obvious question is whether questioning patients immediately before the operation may itself produce anxiety. After all, questioning patients about their preference for information allows them to infer that the doctor knows something of possible importance to them. This knowledge itself may make remaining uninformed far more stressful than it would otherwise be.

<sup>3</sup>In economics, this interdependence between the current policy and observed responses to this policy is known as the "Lucas critique".

anxious patient (Caplin and Leahy [1999]), we treat anxiety as resulting directly from the patient's information about the consequences of the operation. Even in its current simple form, our model provides some valuable insights.

We show that the questionnaire procedure proposed by psychologists does not generalize to life and death operations. It is not always a good idea for the doctor to respect the patient's informational preferences in such cases. Consider a patient who finds information on the operation anxiety inducing, yet whom the doctor believes to be unduly pessimistic. If good news would lower the patient's overall level of anxiety, then the doctor should pass it on at once despite the patient's implicit request to be left in peace. Conversely, it may be a good idea for the doctor to suppress bad news, even if the patient is generally receptive to information. The anxiety produced by bad news may outweigh the anxiety from being uninformed.

Our model also illuminates spillover effects, in which a policy which appears beneficial in the small can do indirect damage. This effect is best brought to life in a somewhat different context. Consider a doctor who tests patients for AIDS, and who can either call them up immediately with the result, or wait a week for an in-person interview. The doctor tests two patients who are acquainted. The first result to come in is negative, and she immediately contacts the subject with the good news, since she knows this will lower his anxiety. He calls his friend with the good news. From then on, his friend sits anxiously waiting by the phone, fearing that with each passing minute the lack of news means that his test is positive.

Was it really such a good idea for the doctor to give good news at once, or should she instead institute a general policy of delaying all news, good or bad? In the case of AIDS testing, the latter policy has been instituted, and it is strictly necessary to make a personal appearance to hear results, good or bad. Our model incorporates this form of spillover effect, and allows one to compare the virtues of a policy of committing to suppress all information with more selective policies.

## 2.4 Challenges for Economics: Part I

On the one hand we have argued that classical economic theory has little of value to say on questions of information provision. On the other hand we have shown that, when suitably amended, economic modeling techniques are essential to policy analysis. So what are the critical amendments that make

economic theory so much more fruitful?

One amendment to classical theory stems from analysis of the spillover effects outlined directly above. Anxiety depends not only on what the doctor chooses to reveal, but what she chooses to suppress. If the doctor is believed to reveal only good news, then silence will induce anxiety, while if the doctor is believed to reveal only bad news, silence will spell relief. Such effects have been missed not only by psychologists, but also by classical game theorists, since it is standard for payoffs to depend only on the state of the world at the end of the game. To allow for the dependence between strategic uncertainty and payoffs, our model builds on the theory of psychological games introduced by Geanakoplos, Pearce, and Stacchetti [1989]. Our game, however, is a simple one. Much work remains to be done before this class of models can be applied in richer dynamic settings.

Our model makes a second and even more fundamental departure from standard economic theory. Our initial expectation had been that we would be able to shoe-horn the patient's dislike of information into the classical apparatus. After all, we were not the first to build a model that allows for exceptions to Blackwell's theorem. In particular the Kreps-Porteus model allows one to capture a preference for delayed revelation of information (Kreps and Porteus [1978]). We were surprised to find that their model was ill-suited to answer the question whether or not the doctor should reveal information to the patient. The only way to model the question was to use our own PEU model.

There is a subtle yet profound difference of approach between our PEU model and the Kreps-Porteus model that accounts for the difference. Modern choice theory is based on the principle of revealed preference, and is behaviorist in spirit. It is held that the only legitimate agenda for the theory is to describe choices among goods that are, or may potentially be, available in the market. Nothing less, and certainly nothing more. The Kreps-Porteus model adheres to this principle, and deliberately avoids discussion of psychological states. In contrast the PEU model places these states center stage. Our policy problem exposes one limitation of the behaviorist program. By definition the patient cannot choose to be overly optimistic. So the doctor cannot infer from his choice behavior alone whether to remain silent if she knows he is overly optimistic.<sup>4</sup> She has to have a broader vision of his wel-

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<sup>4</sup>In a similar manner, revealed preference cannot be used to decide whether or not to throw surprise parties for loved ones. By definition they are unable to choose whether or

fare, one that differentiates between the role that beliefs play as inputs into utility and the role that they play in the calculation of expectations of future outcomes. PEU theory formalizes just such a vision.

## 3 Genetic Testing

The genetic revolution raises profound policy questions. Widespread testing has the potential to radically improve health outcomes, and lower health costs. At the same time testing can raise anxiety, and a negative result may be psychologically devastating. To what extent should public policy aim to promote testing, and how is this goal best accomplished? After presenting some of the existing research findings, we propose further research designed to connect more closely with key policy questions. We close by pointing out further research challenges.

### 3.1 Some Research Findings

Psychological research on genetic testing has focused on two of the first tests to be made widely available: the test for the genetic mutation responsible for Huntington's disease (HD) and the test for the so-called BRCA1 mutation. The BRCA1 mutation is implicated in many hereditary breast cancer cases, and carries with it an increased risk of ovarian cancer. Researchers have studied a wide range of questions including who gets tested, why subjects make the choices they do, and how well subjects understand the information conveyed by the test.

#### 3.1.1 Low Test Rates

The first important question posed by researchers is how many subjects choose to undergo testing in the current policy climate. Survey evidence suggested that there should be high testing rates. Roughly 65% of those at risk for HD (Kessler et al. [1987]) and fully 90% of those at risk for breast and ovarian cancer (Lerman et al. [1994]) reported that they would be very interested in getting test results.

In practice, the uptake rate has turned out to be far lower than expected: about 40% in the case of breast cancer, and even lower in the case of HD. In

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not to throw such parties for themselves.

one study of HD, only 15% of those who initially expressed interest ultimately followed through and got their results (Quaid and Morris [1993]).

### 3.1.2 Research into Motivation

For some, ...nancial factors such as worries about possible loss of health insurance coverage may be critical in the testing decision. For others, psychological factors may dominate. In psychological terms, the low acceptance rate of the HD test is perhaps not surprising. The test is unequivocal, and the disease is not only incurable but also terrifying. First symptoms appear at about age 40 with gradual neurophysiological deterioration over the remaining life span of some 15 years.

Researchers have used surveys to try to understand motives for and against testing. Jacobsen et al. [1997] provide survey evidence on the importance of psychological factors in the case of the BRCA1 test, a test which is far less devastating than the HD test.<sup>5</sup> However even in this case, survey answers suggest that emotional considerations weighed at least as heavily against taking the test as did ...nancial concerns. Fully 85% of the subjects in the study by Jacobsen et al. identi...ed as a reason not to take the test the resulting increased concerns about developing breast cancer; 72% increased worry about family members; 34% worries about losing health insurance coverage; and 27% felt that a bad result of the genetic test would leave them in a state of hopelessness and despair.

### 3.1.3 Ignorance and Education

The desire to avoid information was an important aspect of the medical example of the last section. Such “head in the sand” behavior is even more important in the context of genetic testing. Lerman et al. [1996] surveyed at risk subjects on their understanding of the BRCA1 test. Despite the obvious importance of the issue, and despite having previously been sent literature on the test, ignorance was pervasive. 28% of the subjects were unaware that the BRCA1 gene caused an increased risk of ovarian cancer, while almost

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<sup>5</sup>In contrast to the HD test, neither a positive nor a negative outcome of this test is unequivocal. The mutation is responsible for only 5% of all breast cancer cases, and the probability of a carrier getting breast cancer by age 70 is 85%, while the risk of getting ovarian cancer is 63% (Croyle et al. [1997]). In addition there are various measures that a carrier can take to reduce the probability of disease and death.

80% were off by an order of magnitude in their belief that the BRCA1 gene causes 50% of all cases of breast cancer.

Following these findings, researchers have investigated the impact of education on understanding. Lerman et al. [1997] show that understanding of genetic testing may be significantly enhanced by face-to-face education. Yet the findings of Lerman and Croyle [1995] suggest that much ignorance may have affective rather than cognitive roots. They found that counselling raised the level of comprehension for only 20% of subjects who were highly anxious, yet for almost 80% of those who reported low levels of anxiety.

## 3.2 Policy Questions and Policy Research

We outline three issues for policy makers, and indicate how future research could shed more direct light on policy questions if it incorporated economic reasoning (broadly interpreted).

### 3.2.1 Should Health Insurance be Subsidized?

The low rate of uptake of genetic testing has social ramifications that need to be considered by policy makers. Since society as a whole may have a stake in the testing decision, economic logic suggests that it may be wise to offer incentives for certain individuals to get tested. A simple way to accomplish this would be to subsidize the health insurance rates of such individuals should they agree to testing. At the same time, this would dispose of the fear of “genetic discrimination” in which the insurer is expected to raise health insurance rates in the face of a bad test result.

The question of subsidies pinpoints a methodological gap in the existing research in medical psychology. All experimental data are derived against the backdrop of existing public policy. Researchers analyze how many subjects get tested in the current policy environment, but do not even attempt to answer the question of how testing rates would be impacted by a policy change, such as subsidizing health insurance. Policy analysis requires one to answer hypothetical questions such as the extent to which insurance subsidies would change decisions.

The key research question is how to accurately assess the impact of subsidies on decisions. This task of measurement presents a profound challenge calling for collaboration between economists and psychologists. There will be some subjects who tend to underestimate the subsidy required to induce

testing, just as they overestimate their willingness to get tested. Others may overestimate the required level of compensation in the hope that this induces a large payment to be forthcoming. Designing experimental protocols that correct for such biases will be non-trivial.

### 3.2.2 How to Match Policy with Motive?

The survey evidence on motivation suggests that there may be a limit to how much one could influence the acceptance rate for the HD test and the BRCA1 test with the use of reasonable financial incentives. With multiple motivations go multiple policies. For classical economic man, motivated by purely financial matters, the insurance subsidy should be adequate. However if an individual rejects testing to avoid being plunged into a state of hopelessness or despair, one might favor policies that include high levels of counselling at all stages of the process, with especially strong support services made available in the case of bad news.<sup>6</sup>

Again this question highlights the need for research into counter-factuals. One needs a far more detailed investigation of the variety of motives involved in the decision, using innovative combinations of survey techniques and actual choice experiments. Economists can play a key role not only in ensuring the policy relevance of the resulting findings, but also in developing a menu of policies that are well-matched with the variety of motivations uncovered.

### 3.2.3 Ignorance and Policy

Existing research appears to be premised on the idea that increasing understanding per se is the major goal of educational policy. Yet Lerman and Croyle's finding that high anxiety interferes with learning calls into question the virtues of an aggressive educational effort. Persistent efforts to educate an already anxious subject may further raise his level of stress, with little to show in the form of increased knowledge.

A second question about the virtues of an across-the-board policy to increase knowledge is suggested by the fact that many at risk subjects vastly

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<sup>6</sup>The importance of psychological motivations further accentuates the limitations of standard economic theory. While this theory correctly pinpoints how fear of an increase in health insurance rates may be a deterrent to testing (Sulgarnik and Zilcha [1997]), there is no place for feelings of despair. According to this vision, as soon as one neutralized the insurance issue, preference for testing would become high on universal.

overestimate their risk of getting breast cancer. This form of misunderstanding is associated with a high level of interest in getting tested (Lerman et al. [1994]). Since many of the public health arguments favor increased testing, it is far from clear how much effort should be made to correct these overestimates.<sup>7</sup>

In the end, the optimal educational policy is likely to be somewhat selective. Expenditures should be directed at correcting misunderstandings which are judged to be both important to overcome, and which can be overcome at relatively low cost. Economic modeling is ideally suited to the task of policy design in this setting, given that there are several competing objectives and financial constraints.

### 3.3 Challenges for Economics: Part II

Since anxiety and stress are so important, a natural starting point for modeling is the PEU framework introduced in the last section.<sup>89</sup> Yet the modeling challenges are far more severe in the case of genetic testing. Some of these challenges stem from the far longer time horizon in the case of genetic testing, others from the greater need to develop educational policies to counter certain forms of misunderstanding.

Given the long time horizon, it is important to consider the dynamics of anxiety, stress, and ignorance, and how they feed back onto medical behaviors. Tibben et al. [1993] found that the medium term adverse impact of bad news was significantly higher for those who showed high levels of cancer-related distress prior to testing. Prolonged distress in turn may impact medical outcomes, since it has been shown to deter adherence to breast self examination (Kash et al. [1992]). Modeling anxiety, medical behaviors,

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<sup>7</sup>Similar issues show up in the case of smoking and lung cancer, since many smokers overestimate the risk of lung cancer. One does not see public health expenditures poured into a campaign to enhance informed decision making by correcting these overestimates.

<sup>8</sup>Baum, Brown, Zakowski [1997] present a more textured psychological model.

<sup>9</sup>As with the medical questionnaire of the last section, current genetic testing policy can be criticized as needlessly raising stress. In the existing protocol individuals are first told that the information on their genetic status is available. They are then asked whether or not they want the information. For those who seek to avoid any and all thought about their genetic status, this policy may serve only to raise distress rather than influence the testing decision. Consistent with this hypothesis, Lerman et al. [1998] found a pattern of psychological deterioration among subjects who were offered and yet chose to reject information on the outcome of their BRCA1 test.

and medical outcomes in a rich and empirically relevant dynamic structure will be profoundly challenging.

The long time horizon in the case of genetic testing presents economists with another challenge, this one in the normative arena. Economists are deeply attached to the concept of consumer sovereignty: the idea that each individual makes choices that are in his own best interests. A policy maker may believe that an individual who decides against getting tested is doing predictable damage to his own future health, but according to the principle of consumer sovereignty, the policy maker has no ethical grounds for intervening in this freely made decision.

Employing a broader vision of human motivation than is normally employed in economics leads one to question consumer sovereignty. One issue concerns the stability of preferences over time. Individuals look at one and the same experience from many different viewpoints: prospectively as decision makers, contemporaneously in the realm of experience, and retrospectively through the filter of memory (Kahneman (this volume)). The principle of consumer sovereignty hands all power to the prospective vision, and there may be room for bearing in mind that time changes everything (Caplin and Leahy [2000]). It is clearly possible to regret one's earlier choices. How responsive should policy be to this form of regret?

The psychological literature on "affective forecasting" provides a second possible argument for restricting consumer sovereignty. This body of research suggests that many people overestimate how deep and long-lasting will be the impact of events that are currently perceived as traumatic (Wilson, Gilbert, and Centerbar (this volume)). Consistent with this, Tibben et al. [1993] found that even though post test stress remained high for some who got bad news, it fell quickly back to normal for many others. It is possible that many subjects will have quicker than expected psychological recoveries, while the medical advantages will be profound and long lasting. Should policy makers take note of this asymmetry and offer subsidies to those who get tested, even when there are no obvious benefits to third parties?

Economic theory suggests a powerful counter-argument to this policy proposal. If the policy maker believes that the subject is making a mistake in his assessment of the consequences of the test, she should fully communicate her grounds for disagreeing with him. If he persists despite her best efforts at persuasion, she must end up agreeing that he is making the correct decision.

The problem with this form of logic is that it is based on an unrealistic vision of how easy it is to convey information. The evidence suggests

that it may be very difficult and costly to convey even the simplest piece of information. In some cases, the policy maker's informational advantage may be so large and difficult to reverse that normal rules of sovereignty will need to be reconsidered. Of course there are better and worse ways to use the informational advantage, and these too will need to be understood in a richer psychological context.

This brings us back to the more general question of how to analyze educational policies in emotionally rich settings such as genetic testing. The challenge for economic theory is not only to allow for learning difficulties, but also to allow for the link between anxiety and learning identified by Lerman and Croyle [1995]. This link is further complicated by possible feedback effects. The level of anxiety impedes the learning process. In turn, the resulting low level of understanding may increase uncertainty and exacerbate anxiety, making it yet more difficult to learn. Are there policies that can break through this vicious circle?

## 4 Savings and Portfolio Choice

The U.S personal savings rate fell to 3% in the early 1990's, and remains stuck at a historically low level. This low savings rate threatens to increase the poverty rate among elderly Americans, and further increase pressure on the public purse. Many Americans approach retirement with little personal wealth, and are therefore completely reliant on Social Security payments.

The appropriate policy response depends on what determines the level of savings. In standard economic models, the central determinant of the savings rate is the utility function over current and future consumption. In the classical life cycle model, current consumption weighs heaviest in this function, with the importance of future consumption declining at a constant rate. The hyperbolic discounting model is a prominent alternative to the life cycle model (Strotz [1955], Laibson [1997]). In this model all future consumption is discounted not only according to how far in the future it lies, but also because it does not have the immediacy of current consumption. This double discounting implies that it is hard to implement optimal plans. A forty year old may wish to save for consumption in retirement, yet fear that he would instead "waste" these assets on impulsive spending in the years before retirement.

Both the life cycle model and the hyperbolic model have relatively simple

policy implications. In the former, the way to change the savings rate is to change tax rates and thereby the rate of return to savings. In the latter, one can increase the savings rate by imposing harsh penalties for early withdrawal of funds, as with traditional IRA's. Both types of policy are in current use, and the savings rate has remained stubbornly low. Partly for this reason there are continuing challenges to both models, some of which call for a more direct focus on psychological aspects of the savings decision.

## 4.1 Ignorance, Stress, and Policy

Standard models of savings treats households as if they are attentive to, and well informed about, the savings decision. To the contrary, Yakoboski and Dickemper [1997] found that only 36% of U.S. workers had even tried to determine their retirement needs. Even among households in their later years, approximately 30% report having hardly ever thought about retirement (Lusardi [2000]). These households had dramatically lower savings than those who had given the subject more thought.

What policy measures are suggested by these findings? Is the best policy to provide additional educational materials about savings? In support, Bernheim and Garrett [1995] have shown that savings and participation in financial education counselling are strongly positively correlated. What of efforts to force households to give more attention to their level of retirement consumption? Kotlikoff [1992] proposed that each American worker receive an annual statement of projected Social Security benefits upon retirement, to focus attention on the urgent need for higher savings. A less direct proposal with similar goals is to allow Social Security recipients to have certain portions of their benefits held in funds of their own choosing. To what extent would such a policy induce more households to pay attention to their savings and portfolio strategies?

It is clear that more research is needed to understand the virtues of these various proposals. As in the case of genetic testing, policy analysis rests on a deeper understanding of the sources of inattention and ignorance. Yakoboski and Dickemper [1997] report that one prevalent reason for not determining retirement needs was that subjects were afraid of the answer. Survey results presented by Lusardi [2000] suggest that the whole subject of retirement is surrounded by worries, with concerns about illness and disability being of particular importance. Constant efforts to force attention may produce little except anxiety, much in the same way as constant reminders of one's failure

to undertake genetic testing may induce stress.

## 4.2 Challenges for Economics: Part III

As in the case of genetic testing, several of the challenges for economic theory stem from the long time horizon involved in the savings decision. Yet the challenge is in many ways even deeper, since our ignorance about the psychology of savings is so comprehensive. To what extent is it stressful to contemplate being poor and sick in retirement, and how does this stress influence savings behavior? Is it stressful to learn how to save and invest, and if so does this cause complete withdrawal from the process? Is it stressful to have a savings portfolio that fluctuates in value, and if so does this account for low holding of risky assets?

If the stress of contemplating poverty in retirement results in low savings, then this raises the possibility of feedback effects. For obvious reasons, low savings may heighten the stress associated with retirement. By making the activity of planning for retirement even more distressing, this may in turn further reduce the savings effort. How important are these feedback effects, and what, if anything, can be done about them?

The need to understand the psychology of savings immediately presents a second challenge. In the end, economists will have to rely on experimental and questionnaire techniques to deepen their understanding. Choice data alone are not enough. These data reveal simply that many people save practically nothing, and end up with low consumption in retirement. They cannot reveal why so many people get themselves into this situation. If low consumption in retirement is a matter of deliberative planning and leaves households overjoyed, there is no policy issue. Otherwise policy makers may want to know why so many end up in such dire straights, to help determine what to do about it.

The need to use survey evidence in addition to choice data has not escaped economists' attention. Already, economists interested in understanding savings are turning to this data. Yet the findings in the last section concerning overestimates of willingness to be tested suggest that survey results need to be interpreted with great caution. Indeed a similar gap between stated preference and behavior is identified by Barsky et al. [1997]. They asked respondents how they discounted future relative to current consumption. Remarkably, the answers suggested that future consumption was more important to most respondents than was current consumption. If actual be-

haviors were dominated by such preferences, the savings rates would be far higher than it is.

In order to make the best use of survey evidence, economists will have to join forces with psychologists in exploring why survey answers differ systematically from actual decisions. In this respect it is intriguing that in both the case of genetic testing and time discounting, survey answers suggest a greater concern with long run benefits over short run costs than do decisions. Does the high reported level of patience reflect a form of cognitive idealism in the survey answers, with short run forces of an affective nature dominating actual behavior?<sup>10</sup> If one understands why survey answers differ from actual choices, appropriate corrections can be used to improve the predictive value of such data.

## 5 Concluding Remarks

Working together, economists and psychologists can develop new tools of policy analysis. These tools will be applicable to a broad range of questions in the medical arena, the financial arena, the educational arena, and beyond.

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<sup>10</sup>Temporal construal theory (Trope and Liberman (this volume)) makes a similar distinction. Distant benefits appear to be envisioned at a high level of abstraction, with stressful matters of process dominating the picture at closer range.

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