

Fear As A Policy Instrument

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1 Introduction

Many of the most important decisions that we make depend on the extent of our orientation toward the future. Our long-term financial fitness depends on how much we save in our early and middle years. Our long-term physical fitness depends on the extent that we adopt healthy habits of life when young. Despite their common dependence on future orientation, academic analyses of savings behavior and of preventive health care draw on entirely different intellectual traditions. Savings behavior has been almost the exclusive domain of economists, while health psychologists have dominated the research on preventive health care.

Differences in intellectual tradition between economists and psychologists influence not only the direction of scientific investigation, but also the design of public policies. Economic incentives are front and center in discussions of savings policy, while psychological interventions dominate in the case of preventive health care. In this chapter I develop a hybrid approach to future orientation, which incorporates psychological hypotheses into an otherwise traditional economic model. I apply the model to issues of policy design, with central emphasis on the field of health care. The ultimate goal of this line of research is to develop a framework in which the social value of both economic and psychological health interventions can be understood.

My analysis focuses on two questions: the “positive” one of whether or not policy makers *can* increase future orientation among private citizens, and the “normative” one of whether or not they *should*. Both questions highlight differences in approach between economists and psychologists. With respect to the positive question, economists generally treat future orientation as a fixed individual characteristic that cannot be influenced by policy, while health psychologists spend a great deal of time devising messages precisely to influence future orientation (e.g. Rothman and Salovey 1997 and Witte 1998). With respect to the normative question, economists generally argue against using up scarce resources changing tastes, while health psychologists generally assume that such

interventions are socially desirable provided they produce improvements in health. The rest of the paper analyses how these questions are answered in my hybrid approach.

The starting point for my analysis is the branch of the health communication literature dealing with “fear appeals.” This literature is outlined in section 2 below, following which the model itself is constructed in section 3. The model involves two key departures from classical economic theory. In standard theory, the only legitimate objects of concern are current and anticipated physical states: there is no room for an emotion such as fear. To overcome this limitation, I employ the psychological expected utility model (Caplin and Leahy 2001). In addition, I need to allow a message that contains little new information to influence behavior. Here I follow the fear appeals literature in giving a central role to attentional choice. A successful message will capture attention, induce fear, and thereby motivate prevention.

The solution to the basic model is presented in section 4. The model is broadly consistent with current psychological theory, yet is somewhat more general. While some may view the additional generality as a weakness, I see it as a virtue. At its current early stage of development, the theory is intended primarily as an organizational tool that can be used to highlight questions in need of further investigation.

While one goal of model building is to provide additional structure to existing investigations, a second is to open up entirely new avenues of research. It is this second goal that is the focus of section 5, which analyzes some connections between provoking fear and providing information. Typically, public health authorities know far more about the physical dangers involved in a health threat than does the typical private citizen. Section 5 takes up three issues that such an information asymmetry raises. First, how does the impact of information interact with the presence of fear? Second, what messages are appropriate to send in a setting in which both knowledge and fear may be impacted? Third, are there important spillover effects of public health authorities’ decisions on information provision? In particular, what happens when their desire to use fear as a policy instrument is thoroughly understood by the population at large?

Section 6 addresses the normative question of how society should value different policies of message-transmission. My approach is firmly based in the economic tradition of respecting individual choice. Yet in contrast with the hands-off attitude of economists,

I present an individualistic rationale for policies that encourage people to pay more attention to the future. This rationale rests on the hypothesis that health in old age is especially important when one is old. If this hypothesis is valid, interventionist policies may help to reduce later regret induced by youthful indiscretions.

2 Fear Appeals in Health Communication

Many public health campaigns seek to frighten individuals into changing their behavior. Among the best known of these *fear appeals* are those that try to discourage the use of illegal drugs, to encourage smokers to stop smoking and non-smokers not to start, and to discourage youngsters from becoming habitual criminals (“scared straight”). There is evidence that some of the more recent campaigns in the tobacco arena have had success at least in raising awareness (Hafstad and Aaaro 1997). Yet there are other programs, including scared straight, that appear to have failed in all dimensions (Finckenauer et. al 1999). The critical job for psychological theorists interested in this area is to identify when and how such campaigns can be successfully incorporated into a broader public health campaign.

A recent survey of the fear appeals literature (Witte and Allen 2000) divides the history of the field into several distinct phases. The earliest approaches were grounded in learning theory, and interpreted fear as a drive that motivated action. However the nature of the response was seen as different depending on the level of fear provoked. Janis (1967) proposed that the behavioral response to fear would depend on its intensity - that low levels of fear would lead to inaction, moderate levels would produce self-protective behavior, and high levels would result in counterproductive defensive responses. This early research ground to a halt when the evidence failed to support the hypothesized U-shaped response of self-protective behaviors to the level of fear aroused.

In an effort to revive the model, Leventhal (1971) proposed the parallel processing model. Just as in the earlier work, this model divided the response to any frightening message into two types: danger control responses that lead to preventive activity, and fear control responses that lead to avoidance, including in particular defensive inattention. However, it allowed this tension to be present in response to all

messages, and was far less specific about what might trigger one type of response to dominate another.

In line with the changes happening in the general field of psychology, the next stage of research was essentially cognitive. The protection motivation theory of Rogers (1975) and the more general subjective expected utility model portrayed the choice of preventive actions as depending only on those logical factors that make it good or bad to undertake prevention. How bad is the underlying health threat? How likely is one to suffer if action is not taken? How medically effective is the proposed prevention? How able is one to follow through on the proposed set of preventive acts? Rogers labeled these four dimensions severity, susceptibility, response efficacy, and personal efficacy. The higher the outcome in any of these dimensions, the more likely one was presumed to be to undertake the preventive act.

These cognitive models portray emotional responses as irrelevant to message efficacy. Yet the models failed to explain why some messages conveying identical information seemed to work better than others, and why some even appeared to backfire. In 1992, Witte proposed an integrative model that was designed to address these issues. Her extended parallel processing model (EPPM) follows Leventhal in proposing that the fundamental question is whether a given fear appeal triggers additional vigilance and danger control through prevention, or instead promotes inattention and avoidance as fear control mechanisms (Witte 1992). However she follows the cognitive theorists in making the distinction depend on rational features of the preventive act itself, in particular beliefs about response efficacy and personal efficacy. A recent presentation of the complete model and the level to which its various hypotheses have found experimental support can be found in Witte (1998).

The EPPM represents the current state of the art in the field of fear appeals. In applications, it suggests that one should always pair a frightening message about the consequences of inaction with an upbeat message about the efficacy of a proposed program of prevention. The theory allows for individual differences whereby some are more prone to defensive responses than others. The model has been used or is in the process of being used to design a number of different campaigns with such diverse goals as reducing smoking (Council for a Tobacco-Free Ontario 2000), preventing genital warts

(Witte, Berkowitz, Cameron, and Mckeon 1998), and preventing skin cancer (Stephenson and Witte 1998 and Sunsmart 2000).

3 The Model

The first step in building an economic model is to strip away details that are deemed inessential to the question at hand.ⁱ Since my theoretical model is closely based on the EPPM, the issue on which I focus in this section is how to capture the potential for fear-inducing messages to modify behavior. To isolate this issue, I begin by making the highly artificial assumption that private citizens are perfectly informed about medical matters. The only question for policy makers is one of propaganda: how can they communicate in a manner that motivates change, even when that communication conveys no new facts about the world? Of course, in practice, policy makers are often interested in providing the public with improved information on their medical risks. For this reason issues of information transmission are added to the model in section 5.ⁱⁱ

How to treat the passage of time? Since the key issue is the trade off between current and future welfare, I conceptualize the individual as having but two periods of life. Continuing with the process of simplification, I assume that the health state in period 2 can be either good or bad. However, the state of health can be influenced only by actions taken in period 1. Again, there are only two choices available to the individual, involving a simple yes or no decision on whether or not to undertake preventive care. Taking the preventive action is referred to as choice P , not taking it as choice N .

What is the trade-off in deciding whether or not to undertake the preventive act? On the one hand, this act has current costs measured at $K > 0$ in some standard unit of measurement, such as thousands of dollars. On the other hand, it may impact period 2 health. I assume that it lowers the probability of bad health from b_N to b_P . To translate this probability measure into a utility measure, I fix the utility advantage of certain good health in period 2 over certain ill-health at $H > 0$, measured in the same units as the prevention costs K . The precise value of H reflects both the absolute importance of the health problem, and the importance of period 2 welfare from the perspective of period 1. Using the classical economic model of choice under uncertainty, the expected utility

model, this allows me to calculate the relative costs and benefits of the preventive act. The preventive act will be undertaken if and only if the expected health benefit exceeds the cost of prevention,

$$(b_N - b_P)H \geq K .$$

The classical economic model is remarkably similar to the protection motivation theory of Rogers. The severity of the health threat is H . The individual's susceptibility is measured by b_N . Response efficacy is measured by the difference, $b_N - b_P$. Personal efficacy is analogous to the inverse of the personal cost of the preventive act, $1/K$. Just as proposed by Rogers, inequality (1) shows that increases in any of these factors increase the prevention incentive.

How must the framework be changed to allow for fear, and for policy makers to use propaganda to influence choice? The first necessary amendment is to include fear itself as a contributor to decision-making, as in Akerlof and Dickens (1982). I assume that in period 1 the individual under threat experiences a certain level of fear, $F \geq 0$, associated with the health threat. As with H and K , fear is measured using a monetary equivalent.ⁱⁱⁱ

What exactly is it that makes a particular health threat frightening? I make the natural assumption that a central determinant of fear is the actual danger posed by the health threat. I treat this level of danger in the simplest possible fashion, as reflecting the direct impact on current welfare of the actual bad outcome, much in the spirit of Jevons (1905) and Loewenstein (1987). The level of danger resulting from action P is assumed to be $b_P H$, which is the expected health cost resulting from the given choice of action. Similarly the (higher) danger from action N is $b_N H$.

While danger and fear are related, they are not identical. One reason for differentiating between them is to allow for differences in magnitude between fear and the actual health threat. Thinking about a future car accident is frightening, but it is surely not as unpleasant as the accident itself. A second reason for differentiating between danger and fear is to allow a role for the level of *attention* demanded by the health threat. Even if one is in danger, the level of fear may be very low if one is able to provide

oneself with adequate distraction. Conversely, a relatively low level of danger may be experienced as very unpleasant if it becomes a subject of obsession.

The following simple equations let me introduce large differences between fear and danger:

$$F_p = A_p b_p H;$$
$$F_N = A_N b_N H.$$

The only restriction I impose is that A_p and A_N are both positive, since negative values appear nonsensical. Given the connection with attention, I refer to A_p and A_N as *attentional multipliers*.

It is the attentional multipliers that connect this framework with the fear appeals literature summarized in the last section. The key question in that literature is how and why health messages influence fear, and thereby change the calculus of prevention. The multipliers allow me to follow the fear appeals literature in conceiving of health messages as operating through an attentional channel. In particular, I assume that many different health messages that can be communicated, varying in their intensity, m . Higher levels of intensity represent ever more forceful methods of drawing attention to the future threat. In practical terms, this corresponds to such measures as placing gruesome pictures of the impact of the health threat in ever more intrusive locations. Higher levels of intensity always succeed in provoking attention, and thereby make the subject more upset about the dangers involved in failing to undertake preventive activities. These will indeed be fear-inducing messages.

What is it that determines the precise level of the attentional multipliers? I view the level of attention as a function of the health threat, the message intensity, and whether or not the preventive act is undertaken. I use the notation $A_p(m, H)$ and $A_N(m, H)$ to reflect the levels of attention given to a health threat of type H given a message of intensity m , conditional respectively on undertaking and on not undertaking the preventive act. Naturally, I assume that more intense messages and worse health threats make the danger ever more attention grabbing.

What is the impact of the preventive act itself on attention? The interesting cases analyzed in the EPPM in which fear avoidance causes the preventive act to be rejected

require that prevention is more stressful than neglect. Psychologically, this may occur if the effort to battle a future threat involves an effort of concentration that connects it with the source of fear. An example is breast self-examination, a setting in which heightened susceptibility has been found to be a disincentive to preventive care (Kash et. al 1992). To capture this effect, I make the qualitative assumption that to engage in the preventive activity necessitates giving higher attention to the threat,

$$A_p(m, H) \geq A_N(m, H).$$

The model is now complete, at least in conceptual terms. Given the presence of fear, the decision whether or not to take preventive action depends not only on the net discounted health benefits, but also on the level of fear associated with the two options. Prevention will be undertaken if and only if,

$$(b_N - b_p)H + (F_N - F_p) \geq K. \quad (1)$$

The new term $(F_N - F_p)$ in inequality (1) is the “fear differential”: it represents the difference in the level of fear depending on whether or not the preventive act is undertaken. If the fear differential is positive, then taking the preventive action decreases fear. If the fear differential is negative, then the preventive action increases fear. The precise value of the fear differential reflects the combination of actual danger, and the amount of attention that attention receives. Equation (2) summarizes the operation of these two forces:

$$F_N - F_p = H[b_N A_N(m, H) - b_p A_p(m, H)]. \quad (2)$$

4 Some Important Cases

Equations (1) and (2) represent the complete solution to the model, at least in conceptual terms. What is missing is detail on how the prevention incentive is impacted by the presence of fear, and how this incentive depends on the intensity of the health

messages. Rather than trying to provide unequivocal answers to these questions, it seems more appropriate to explore possibilities using simple special cases.

4.1 Proportionality and the EPPM

One particularly simple case arises when the preventive act has a fixed proportionate impact on the prevention incentive,

$$A_p(m, H) = (1 + \lambda)A_N(m, H). \quad (3)$$

Here $\lambda \geq 0$ can be interpreted precisely as the incremental impact of prevention on attention. Higher levels of λ make the preventive act more and more costly in terms of attention. With this assumption, the condition for prevention to raise the level of fear is,

$$\lambda > \frac{b_N - b_P}{b_P}. \quad (4)$$

If this inequality is valid, the fear differential is negative so that fear acts as a disincentive to prevention. Precisely this same condition ensures that increases in message intensity are a disincentive to prevention, since they further expand the fear-based incentive to inaction. On the other hand if the inequality is reversed, increases in message intensity expand the fear-based incentive to undertake the preventive act.

Equality (4) indicates how well this simple proportional case captures the current state of the art in the fear appeals literature. As outlined in section 2, the central hypothesis of that literature is that a fear appeal is far more likely to incentivize the positive danger-reducing outcome if it is combined with a strong efficacy message. In contrast, if one stirs up fears but the individual does not believe that prevention is all that effective, the message may be counterproductive. In the model, the natural efficacy measure is precisely $\frac{b_N - b_P}{b_P}$. It measures the impact of the treatment in reducing danger as compared with the extent of the danger that remains even if the treatment is

undertaken. With high efficacy, fear is reduced if the preventive act is undertaken, and more intense message transmission serves to expand this fear-based differential. With low efficacy, the opposite statements are true: prevention raises fear, and intense message transmission serves only to further discourage prevention.

4.2 Obsession and Avoidance

What happens if attention depends in a more intricate manner on the preventive act than in the simple proportional case? In this section I outline two entirely opposite possibilities to make a general point. I believe that the impact of messages on the prevention incentive needs to be analyzed on a case-by-case basis, and that it may depend on rich details of given health settings and character types. One valuable role of psychological research in this area would be to develop a more detailed inventory of the characteristics of different health settings and of different personality types to pin down conditions under which fear can be fruitfully used to motivate prevention.

Case 1: Creating an Obsession. Consider an individual who at some point becomes almost totally preoccupied with health status, either due to complete saturation with messages, the objective nature of the health threat, or personality type. If the health authorities believe that they can induce complete preoccupation merely by sending highly intense messages (e.g. plastering all walls with horrific images), then fear can certainly be an effective policy instrument. If the subject becomes completely preoccupied with the health threat regardless of whether or not he undertakes the preventive act, the resulting high level of fear further motivates the preventive act.

The case of unconditional preoccupation produces the possibility that ever more intense messages become more and more productive in terms of the prevention incentive, by making it harder to avoid contact with the danger even if one does not undertake the

preventive act. We now describe the converse case in which this strategy would completely backfire.

Case 2: Provoking Avoidance. Suppose that there was a costly form of distraction in which the subject could engage, provided he did not undertake the preventive act (e.g. refusing to watch any television because of constant messages about the implications of drinking and driving). If such a form of costly avoidance were available, the end result would be a non-linearity in the impact of message intensity. As soon as the level of attention associated with the health threat became too unpleasant to bear, the individual would be completely unwilling to engage in the preventive act. Messages that triggered this form of complete avoidance would clearly be counter-productive as incentives to prevention.

5 Information Provision

This section explores several new issues that arise when messages may contain both information and propaganda. In terms of the model, messages may not only induce fear, they may also change subjective beliefs about the extent of the health threat, and the value of the preventive act in reducing risk.

5.1 Fear and the Provision of Information

In a world without fear, it is clear what types of information give rise to an additional prevention incentive. If the public health authorities provide information indicating that the treatment is more effective than is believed by private agents, the private prevention incentive is raised. The prevention incentive is similarly increased if they provide information that the danger of inaction is greater than believed, or that the actual damage to health is greater than expected. In terms of the model, a fall in b_p , and an increase in either b_N or H all act to increase the purely economic incentive to undertake preventive care.

Do the same conclusions concerning the impact of new information on b_p , b_N , and H follow when one allows for the presence of fear? It is clear that a fall in b_p is all to the good as a prevention incentive: it improves the actual outcome associated with prevention, and lowers the level of danger associated with prevention, and thereby the level of fear. Similarly, an increase in b_N both causes the actual outcome associated with inaction to deteriorate, and raises the level of fear associated with such inaction. An increase in H has a more intricate impact on the prevention incentive since the change in the fear differential is less clear-cut. An example, albeit somewhat extreme, indicates that an increase in H can raise the fear differential, and thereby be a disincentive to prevention.

Case 3. A U-Shaped Response: Consider an individual who is able, absent propaganda, to ignore the health threat completely unless he undertakes the preventive act, $A_N(0, H) = 0$ (the zero in the first argument corresponds to the absence of propaganda). Assume also that the level of attention in the case of prevention is precisely equal to the health threat, $A_p(0, H) = H$. In this case, it turns out that there is a U-shaped response of the prevention incentive to the extent of the health threat. This can be confirmed by noting that the fear differential in this case is,

$$F_N - F_p = -b_p H^2.$$

Substitution into equation (1) reveals that the preventive act is undertaken if and only if,

$$b_N H - b_p H - b_p H^2 \geq K.$$

The left hand side of this equation is first increasing in H , and then decreasing. This means that increases in H up to a threshold raise the prevention incentive, but that further increases beyond this threshold lower it. For low levels of H , danger reduction motivates prevention. For high levels of H , fear prevention motivates avoidance.

In this example, providing negative information on the health threat may produce perverse incentives when that threat is already perceived as dangerously large. Rather than encouraging the subject to adopt the preventive measure, further adverse information induces him to bury his head yet further into the sand. The U-shaped effect of negative information and fear on the prevention incentive in this case is very reminiscent of the initial hypothesis of Janis (1967). This suggests that it may be more appropriate to view his theory as a special case valid in particular circumstances, rather than as completely mistaken. Note that his case is more likely to be valid when efficacy is low, since low efficacy reduces the actual health benefits of action, while leaving the remaining risk still frighteningly high.

5.2 Information and Propaganda

In what manner do information provision and propaganda interact? How should message content and message intensity interact? These issues are far too rich to address in detail in the current context. Nevertheless it is easy to construct a case in which the direction in which information provision influences the prevention incentive depends on the intensity with which propaganda messages are being pushed.

Case 4. Using Intrusive Messages to Overcome Resistance: This example combines case 1 and case 3. As in case 3, we assume that when there is no propaganda, there is a U-shaped relationship between the extent of the health threat and the incentive to undertake the preventive act. However as in case 1 we assume that with enough propaganda, there is complete obsession with the health threat. This means that in the absence of propaganda, bad news about the health threat acts as a disincentive to prevention if H exceeds a critical threshold just as in case 3. However, once message intensity is so high that the subject becomes completely obsessed with the health threat, increases in danger are a pure incentive to prevention, just as in the purely economic model.

In this example, bad news about the health threat is a disincentive to prevention if there is low propaganda, yet a positive incentive if there is a high level of propaganda. With low propaganda, avoiding the preventive act aids greatly in fear reduction. However the propaganda is able to break through this type of avoidance, forcing the dangers to mind even when the preventive act is not taken. At this point, the best decision is clearly to take the preventive act and thereby reduce the actual health risk.

5.3 Feedback Effects

In the above examples, I have treated the news on a “once-off” basis. If the health authorities happen to know something that they can convey to the public, is this information going to encourage or to discourage the preventive act? Yet such a piece-meal analysis is not fully satisfactory. In the long run, policies *themselves* have feedback effects. In particular, the policies will influence how the public interprets any information it receives, an issue addressed by Caplin and Leahy (1999) in a particularly simple setting.

One important feedback effect concerns credibility. If people know that the health authority is trying to increase preventive behavior, then their communications may lack credibility. Only “hard evidence” will be seen as anything other than propaganda. If hard evidence is the only valid form of information, then the next step in public skepticism might be to wonder what are the implications of a lack of such information. Given that the public health authorities are scouring the scientific news for evidence that certain behaviors are damaging, the absence of such information may be seen as conveying the good news that the danger is not as severe as was previously believed. Once this stage is reached, lack of information transmission itself becomes a policy instrument, and may influence both the prevention decision and the level of fear. Going one step further, public health messages may ultimately reduce the private incentive to gather information. If there is an expert organization filtering information for relevance, why should any individual expend energy assessing the future health implications of his current choices? Important as are these questions, they lie beyond the scope of the present analysis. Of course, it is my hope that others will deem them worthy of thought, thereby further

enriching our practical knowledge of when and how fear appeals may be effective in inducing preventive behavior.

6 Policy

Economic model building allows one to study not only positive but also normative aspects of policy. While it is possible that a policy of provoking fear may be effective in raising the incentive to undertake preventive acts, is such a policy ever a good thing from the welfare perspective? Since my interest in this section is primarily methodological, I restrict attention to the case of purely propagandistic messages and to the case of proportionality, as defined in equation (3). In this case to understand whether or not messages can raise the overall level of utility, two different cases must be considered depending on the validity of inequality (4).

CASE 1: $\lambda > \frac{b_N - b_P}{b_P}$. This is the case in which additional messages are a disincentive to prevention. In this case, publicity is only a bad thing. If an individual chooses to undertake the preventive act in spite of the disincentive provided by the message, then all that has happened is that his level of fear has been needlessly raised. Similarly, nothing is accomplished except the raising of fear if the individual would not engage in the preventive act even absent the message. Finally, if the message induces the private agent to no longer undertake the preventive act that he would otherwise have undertaken, then he ends up in an even worse position: he is worse off than he would have been if there was no publicity, and he had chosen the worse option at that point of not undertaking the preventive act.

CASE 2: $\lambda \leq \frac{b_N - b_P}{b_P}$. In this case, publicity is able to alter the incentive in favor of prevention. In fact, the only possible benefit occurs when an individual who would not otherwise have undertaken the preventive act is induced to do so by the

additional publicity. In this case, preventive measures are not undertaken at $m = 0$, yet are undertaken at some cutoff level of $\bar{m} > 0$. It is immediate that increases in intensity above this critical level are a bad idea, since they raise fear without changing the decision. For the same reason it is clear that $m = 0$ is the best policy among those that do not induce the preventive act. So is it better to set entirely refrain from sending any message, or to hit \bar{m} exactly? A little thought shows that from the viewpoint of the decision maker, sending no message is definitely superior. At the cutoff point \bar{m} the decision maker is indifferent between prevention and non-prevention, and is certainly worse off in the case of non-prevention than with the lower level of fear when no message is sent.

The above arguments show that it is always in the best interests of the private decision maker to set $m = 0$, even if it is costless to send messages. This conclusion appears somewhat at odds with the recommendations of experts in health communication, who generally measure their success by the extent that they reduce target behavior. Why are propagandistic messages that promote prevention damaging to welfare, even if they succeed in their goal? One part of the answer is that the view that future health is all that is at stake here is simply too narrow. Fear is also important, and it is definitely not a good idea to provoke fear for its own sake. In a richer setting, this caveat to a one-dimensional view of the problem may be even more important. If one stops a troubled teen from smoking, what will be the second-best outlet for rebellious instincts, and can one be sure that this will not be even more dangerous to future well being?

Does adoption of a multidimensional approach to utility imply that one must accept the economic argument that $m = 0$ is the best policy? To the contrary, I believe this argument to be vulnerable to attack on the grounds that it is excessively present-based. If an individual chooses to put his head in the sand, should a benevolent policy maker leave him to get run over by a bus, or should she try to force him to pay attention to the danger? In intuitive terms, such situations point to a conflict of interest between present and future self. It has recently been argued that such conflicts are close to universal (Kahneman, Wakker, and Sarin 1997, Caplin and Leahy 2000, and O'Donoghue and Rabin 2001). The fundamental argument is that utility functions

summarize personal welfare *only at the moment of decision-making in period 1*. This may not be the same as the view of welfare either from earlier periods (as in O'Donoghue and Rabin), or from later periods (as in Caplin and Leahy).

In the simple two period model of the paper, the argument of Caplin and Leahy is particularly easy to illustrate. There are present costs of the preventive act, both economic and psychological. What gets set against this is a future health benefit. Caplin and Leahy argue that this future benefit will in period 2 be viewed as more important relative to period 1 costs than it is in period 1. It seems intuitively reasonable that health in old age is especially important when one is old. If so, and if the social planner's objective is to maximize a weighted sum of welfare in the two periods, her policy should be more oriented toward prevention than is the first period choice. Even if head-in-the-sand behavior is currently attractive, the social planner should intervene if she believes that the subject will later be grateful for her intervention.

While recent research in welfare theory points has produced valuable insights, there remain many unanswered questions. Is there any reason for differential treatment of economic and psychological costs? How does period 1 fear impact the utility function in period 2? The answers to these questions rest on a deeper understanding of how and why the future and the past matter to current decision makers. In the language of Loewenstein 1992, it may be important to distinguish between "Samuelsonian" forces, reflecting the cognitive weight of the future in the present, and "Jevonian" forces, reflecting immediate rewards and punishments based on anticipations of the future.

7 Concluding Remarks

The paper began with two questions, one positive and one normative. Is there anything that policy makers can do to increase future orientation among private citizens? If so, should they? In order to answer these questions, I describe a simple model of health communication that places psychological insights into an economic framework. The model provides an affirmative answer to the positive question, and a more even-handed answer to the normative one. Policies that promote fear can be used to change future orientation, and there are some cases in which such policies may be socially beneficial.

I view the model of this paper as merely the first step in a larger agenda, which is to develop a framework in which the social value of both economic and psychological health interventions can be understood. Caplin and Eliaz (2002) take a further step in this direction, by analyzing the potential for psychologically inspired policy interventions to reduce the spread of AIDS. More generally, the potential payoffs would seem to be enormous if economists and psychologists interested in health care were able to unite around a common analytic framework. The need for such a framework will grow ever-more pressing given the rapid advances in medical technology. Indeed Caplin and Leahy (2002) suggest some specific policy questions growing out of the genetic revolution that appear to require just such a framework.

In addition to health care, the hybrid approach to future orientation proposed in the paper connects with broader streams in the fields of psychology and economics. With respect to psychology, I believe that the model would be greatly enriched by incorporating the ideas of Metcalf and Mischel (1998) on delay of gratification.^{iv} There are also interesting connections with the theory of cognitive dissonance, which suggests that beliefs themselves be somewhat flexible.^v With respect to economics, it is important to explore the extent to which the current framework generalizes to the financial arena. Many households pay very little attention to their financial future in light of its importance in later life. In turn, this low level of attention is connected with low levels of savings and wealth accumulation (Lusardi 2000 and Ameriks, Caplin, and Leahy 2002). In what circumstances can fear be used as a policy instrument to increase the savings rate, and when are such interventions beneficial?

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ⁱ Of course separating essential from inessential elements is a highly personal art form. I view a model as successful provided it delivers, or at least promises to deliver, insights of potential value to practitioners. I believe that the current model, crude as it is, achieves this standard.

ⁱⁱ Which task is more central depends on the particular case in point. In the case of AIDS prevention, the first order task is to convey information on behaviors in the sexual and other arenas that can reduce risk. In the case of tobacco, the propaganda element dominates. Indeed there is evidence that most people overestimate the dangers of smoking (Viscusi 1992), so that a purely informational campaign might reduce fear rather than raise it. The fear appeal is based not on presenting novel information, but rather on putting the case against smoking in a form that motivates more individuals to quit.

ⁱⁱⁱ Of course, the very idea that one can find such a simple equivalence between emotional stress, health problems, and monetary costs is open to question. In future, it will be increasingly important to develop richer models of the emotions, with the more general model in Caplin and Leahy [2001] serving as one possible starting point.

^{iv} The fear appeals literature implies that one way to increase future orientation is to use fear to “heat up” future payoffs. Metcalf and Mischel argue for the converse approach of “cooling down” factors that promote short sightedness, using such techniques as diverting attention from objects of immediate desire. Given that the ideas are so complementary, it should be relatively straightforward to develop an integrative model encompassing both.

^v Models of dissonance have been constructed both by Akerlof and Dickens (1982) to explain under-investment in future health, and by Dickens to explain possibly perverse effects of increased punishments on the incentive to commit crime.