Introduction

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A COMMON image of addiction is captured in the following thumbnail sketch of rats who have been trained to stimulate the pleasure circuits in their brains by pressing a lever:

> The rat rapidly acquires the lever-pressing "habit"—giving itself approximately 5,000–10,000 pleasure/reward "hits" during each one-hour daily test session. During these test sessions, the rat is totally focused on obtaining the desired electrical stimulation—lever-pressing at maximum speed and completely ignoring other attractions within the test chamber (food, water, playthings, sexually receptive rats of the opposite sex). After several weeks, the rat suddenly faces a new and unexpected behavioral contingency. An electrified metal floor grid has been placed in the test chamber, between the entrance and the wall-mounted lever. This floor grid delivers intensely painful footshocks. The rat enters the chamber, received a footshock, and jumps back off the floor grid. It stands in the entrance, looking alternately at the aversive floor grid and the appealing wall-mounted lever. After some minutes of indecision, it crosses the floor-grid, receiving intensely painful footshocks with every step (and flinching and squealing in pain), to reach the lever and once again self-administer the pleasurable brain stimulation (Gardner and David 1999, 94).

We may or may not want to say that the rat is *addicted* to brain stimulation, which produces craving but not tolerance and withdrawal symptoms. Yet the syndrome described in the passage is one that matches a widespread view of the behavior of addicts. Compare, for instance, the rat in front of the aversive grid with a habitual drunkard as described by a nineteenth-century pioneer in the study of alcohol, Benjamin Rush: "When strongly urged, by one of his friends, to leave off drinking, he said, 'Were a keg of rum in one corner of a room, and were

a cannon constantly discharging balls between me and it, I could not refrain from passing before that cannon, in order to get at the rum' " (cited in Levine 1978, 152). A common pretheoretical view of human addiction does in fact suggest that the behavior of the addict is based on an irresistible craving: compulsive, mechanical, and insensitive to all other rewards and punishments. At least this is supposed to be true for the most strongly addictive drugs, such as crack cocaine. In their use of these drugs, human beings allegedly do not differ from rats in their tendency to ignore all other considerations for the sake of the euphoria of consumption or relief from the dysphoria of abstinence.

The essays collected in this volume challenge this commonsensical view of addiction. Most simply stated, they show that addiction in humans differs from addiction in animals because of various specific properties of human beings. Unlike animals, which mostly behave like simple reinforcement machines, they can make *choices* on the basis of long-term consequences of present behavior. Unlike animals, which do not seem capable of introspection, they can have *awareness* of their addiction, deplore it, and fight it. Unlike animals, which lack beliefs and values of the requisite complexity, they are embedded in a *culture* that shapes cognition and motivation in ways that matter for drug consumption. This being said, the contributors also emphasize the commonalities of animal and human behavior. No contributor defends the view that drug consumption is simply a matter of rational choice or the view that addiction is simply a cultural construction. The neurophysiological facts about drug use—which are essentially the same in animals and humans—provide hard constraints on any choice-based or culture-based account of addiction. Even more obviously, no *treatment* of addiction can ignore these constraints.

Because of the many facets of human addiction, an interdisciplinary approach is called for. Whereas the study of addiction in animals is confined within the biological sciences, human addiction must be understood in light of the cognitive, moral, and cultural capacities of human beings, whence the need to draw on the humanities as well as the social sciences. In this volume, Gary Watson (a philosopher) shows that phrases such as "overpowering desire" and "irresistible desire" are intrinsically confused, at least when applied to human behavior. Olav Gjelsvik (also a philosopher) argues in his chapter that because humans typically internalize certain normative attitudes toward choice over time, a purely naturalistic account of addiction is insufficient. From a choice-theoretic perspective, the chapter by Ted O'Donoghue and Matthew Rabin (two economists) and the one by Ole-Jørgen Skog (a sociologist) show that once an addict becomes aware of his predicament, he can take action to deal strategically with his future selves. In their chapter, Helge Waal and Jørg Mørland (a psychiatrist and a neurophysiologist) stage a systematic confrontation between three choice-theoretic approaches on the one hand

and neurophysiological and clinical data on the other. Their analysis is neatly supplemented by George Ainslie's chapter, which contrasts one of these approaches (his own) with another (George Loewenstein's theory of visceral motivations). In the chapters by Caroline Acker (an anthropologist) and myself (a philosopher), a central argument is that socially prevailing beliefs about addiction can shape the behavior of addicts and of the doctors who treat them. Eliot Gardner's chapter provides a state-of-the-art summary of the neurophysiology of addiction, with emphasis on genetic predispositions to addiction and potential techniques for neutralizing them.

The Becker-Murphy Causal Model of Addiction

In an influential article, Gary Becker and Kevin Murphy (1988) present a model of rational addiction. The model has two main aspects. On the one hand, it offers a simple causal model of the consequences of consuming addictive substances. On the other hand, it offers a standard belief-desire account of how people might choose to engage in such consumption.

The Becker-Murphy causal model offers a valuable bridge between economics and neurophysiology. This creation of a common language is perhaps their most important contribution to the analysis of addiction. The causal model is in fact retained by several writers in this volume who do not share the belief-desire account of addiction.

In the causal model, addiction is characterized in terms of habit formation and negative internalities. (See notably the chapter by O'Donoghue and Rabin for an explanation of these two properties and the relation between them and Skog's chapter for a diagrammatic illustration.) The first feature, habit formation, implies that the more one consumes of the addictive drug now, the more one wants to consume in the future; or more technically, that past consumption increases the instantaneous *marginal* utility from current consumption. The second feature, negative internalities, implies that past consumption decreases the instantaneous *total* utility from current consumption. Intuitively, the first feature reflects the production of withdrawal symptoms and the second the emergence of tolerance phenomena.

The representation of important properties of addiction in the economist's language of utility functions is a considerable achievement. Yet the mapping is not perfect. As argued by Skog (1999), the two properties could also derive from other features of addictive drugs. Moreover, Becker's model does not incorporate the important phenomenon of cue-dependent cravings (but see Laibson 1996a for a Becker-type model of this feature of addiction). Also, as Gardner emphasizes in his chapter, the implicit assumption in the Becker-Murphy model—that people crave

drugs mainly for relief from abstinence symptoms—ignores the basic fact that "recreational and addiction-producing drugs act on . . . brain mechanisms to produce the subjective reward, or high, sought by drug users." Craving is due not only to the push from dysphoria but also to the pull from euphoria. In particular, the *memory* of euphoria seems to be a very important aspect of the phenomenon of relapse, which the Becker-Murphy model is ill equipped to handle. Finally, as Waal and Mørland explain in their chapter, the importance of tolerance and withdrawal phenomena vary greatly from drug to drug. They also emphasize that drug effects that take place outside the dopaminergic system of the brain, where euphoria or dysphoria are encoded, also have an important place in explaining the addictive properties of drugs.

The Belief-Desire Models of Addiction

The mechanics of addiction is obviously an important part of explaining addictive behavior. Yet it is, equally obviously, insufficient. To understand why people start using addictive drugs, why some of the users become addicted, and why some of the addicted users eventually quit, we also need to model the beliefs and the motivations or desires of the users.

Consider first the *beliefs* of the users. Becker and Murphy (1988) assume, heroically, that people embark on a life of addiction with full knowledge about the harmful consequences of the behavior. At the other extreme of the spectrum, there is the "primrose path" model of addiction proposed by Richard Herrnstein and Drazen Prelec (1992), according to which people get trapped into addiction because they ignore the negative internalities. An intermediate position is argued by Athanasios Orphanides and David Zervos (1995). In their model, people know that they might be at risk if they start using addictive drugs but also know that there is a possibility that they might be able to consume without any harmful consequences. The contributors to the present volume do not emphasize this cognitive dimension of drug use. They assume, by and large, that people have accurate beliefs about the harmful consequences of drug use. (The chapter by Waal and Mørland is an exception.)

The contributors place more emphasis on another cognitive dimension, referred to as naiveté versus sophistication. To explain what that issue is, I first have to say something about the *motivations* of the users. Assuming for simplicity that people are motivated only by the desire for hedonic satisfaction, the question arises whether future hedonic experiences have the same motivational power as present ones. In more technical language, this is the issue of *time discounting,* which has a prominent place in many of the chapters of this volume. In Gjelsvik's chapter, the

question is addressed from a normative point of view. Gjelsvik belongs to a long line of philosophers who question the rationality of very high rates of time discounting. He argues that some discounting is consistent with rational self-governance (just as some risk taking is consistent with a rational life) but that very high discounting is not (any more than extreme degrees of risk taking).

In the chapters by O'Donoghue-Rabin, Skog, and Ainslie, the issue of time discounting is addressed from an explanatory point of view. Exactly how do people discount the future? And what are the behavioral implications of discounting? Before 1955, it was generally assumed by those who thought systematically about the matter that the future is discounted *exponentially.* Simply put, this assumption means that the *relative* motivational force of any two future hedonic experiences remains constant as one moves closer to them in time. (Because of the discounting phenomenon, their *absolute* value or motivational force, compared to consumption in the present, increases as one moves closer to them.) An implication is that an exponentially discounting agent who wants to allocate consumption over time never has to reconsider his decision. Exponential discounting is *time consistent* because the relative value of consumption in any two periods remains constant. In his work on addiction, Becker assumes that people discount exponentially. Except for a brief remark (in Becker 1996, 120), he also assumes that the discounting function involved in addiction is *constant.*

The assumptions of exponential and constant rates of discounting can both be challenged. In a pioneering article, Robert Strotz (1955) argues that people discount the future hyperbolically rather than exponentially. One implication of his argument is that the relative motivational force of an early compared to a later hedonic experience increases as one moves closer to them in time. Intuitively, the value of the present relative to the near future is higher than the value of the near future relative to the more distant future. Another implication is that of time inconsistency: a hyperbolically discounting agent may have to reconsider his plan as he moves closer to the time when he has to implement it. Seen from a distance, a delayed greater reward may seem better than a smaller earlier reward, but as the agent approaches the moment when the early reward becomes available, his preferences may be reversed. Over the years, George Ainslie (see notably Ainslie 1992) has explored the properties of hyperbolic discounting in a number of domains, including addiction. The reader is referred to his chapter as well as to Skog's chapter for details.

Later, Edmund Phelps and Robert Pollak (1968) offered a different approach to nonexponential time discounting. In their model, discounted utility is a sum of utility from consumption in the current period and

some fraction of exponentially discounted utility from consumption in future periods. If the fraction is equal to one, this reduces to the exponential case. If it is less than one, we obtain a discounting function that differs from both the exponential and hyperbolic forms. Following David Laibson (1996b), we may refer to this as quasi-hyperbolic discounting. When the fraction is less than one, it is qualitatively quite similar to hyperbolic discounting, in the sense that both implications mentioned in the previous paragraph also obtain under this model. The reader is referred to the chapter by O'Donoghue and Rabin for details.

The idea that discounting functions—whether exponential, hyperbolic, or quasi-hyperbolic—might not stay constant over time is a more recent development. It comes in two versions. The most ambitious version is offered by Gary Becker and Casey Mulligan (1997), who argue that people can choose their rate of time discounting. I argue against this idea in Elster (1997). A less ambitious claim is that rates of time discounting, like other aspects of the person, undergo causal, unplanned processes of change. In their chapter, O'Donoghue and Rabin explore this idea under the rubric "variable myopia," including the important case of consumption-induced myopia. Related arguments are found in Skog (1997) and Orphanides and Zervos (1998).

Both time inconsistency and changes in discounting functions may cause people to deviate from their plans. The person who decides to abstain from drinking on the weekend may, because of hyperbolic discounting, reverse his preferences when Saturday approaches. The person who decides to limit himself to two glasses of whisky may, because of consumption-induced myopia, go on to a third, fourth, and fifth glass. Either of these reversal experiences can give rise to learning. Once the person observes himself reversing his decisions time and again, he will come to know that this is just the way he behaves under these circumstances. In the language of O'Donoghue and Rabin, he is no longer naive, but sophisticated. In the language of the belief-desire model, he has *a new belief about his future desire* that is capable of modifying his behavior in the present.

Once a person knows that he is likely to react in a certain way to specific circumstances, that knowledge becomes part of his decision problem. To use a metaphor—which should not be taken too seriously—his future selves may then appear as constraints on the decision of his current self. He cannot lay plans for later periods and blithely assume that his future selves will implement them. Instead, if he would like to take two drinks at the party but knows that if he does he is likely to take five, he might decide to limit himself to one drink if that will leave his rate of time discounting unaffected. This example supports the commonsense idea that sophistication about one's own undesirable tendencies can

help one keep them in check. O'Donoghue and Rabin show, however, that in the simplest case sophistication is harmful rather than helpful. In their three-period example, a naive person who is unaware of his inconsistent discounting will *plan* to abstain in the first and the second periods and consume in the third but will *in fact* abstain in the first and consume in the second and third. A sophisticated person will correctly expect that he will consume in all three periods. This result does not obtain under more complex conditions. O'Donoghue and Rabin show that when either the benefits from drug use or rates of time discounting vary over time, the naive person typically consumes more than the sophisticated one.

This strategy—taking one's future decisions as parameters for one's current decision—is not the only strategy available to a person who is subject to time inconsistency. As Ainslie (1992) shows, the agent may also try to overcome the problem by looking at the current decision as part of a series of identical future choices. On each occasion, one can choose between an impulsive decision (for example, smoking) and a more prudent decision (for example, abstaining from smoking). Well ahead of each occasion one intends to abstain, but because of a preference reversal induced by the hyperbolic discounting one makes the impulsive choice on each occasion. If, however, one can frame the problem as one in which the options are "always smoke" and "never smoke," one may prefer the latter option. This framing depends on the earlier choice being seen as a predictor of later choices: "If not now, when?"

There is no doubt that the strategy of bunching successive choices together often helps people to overcome their tendency to behave in a time-inconsistent manner. The setting up of an intrapsychic domino effect can be very effective in resisting temptation. Two of the chapters in the present volume cast some doubt, however, on the rationality and universal efficacy of the strategy. Following Michael Bratman (1995), Gjelsvik argues that Ainslie does not show the belief in the efficacy of precedent, "If not now, when?" to be *rational.* Skog, by contrast, questions the statement that bunching will invariably be *effective* in overcoming inconsistency and shows that the effect of bunching depends on the time horizon of the addict. If he sees an imminent decision to consume as a predictor of a very long string of later decisions to consume, he will decide to abstain and stick to his decision; if he sees it as predicting only a few later decisions, he will decide to consume and stick to the decision; whereas an addict with a horizon of intermediate length will decide to abstain and then change his or her mind.

The reader should study the chapters by O'Donoghue-Rabin and Skog to appreciate the force of their arguments. Here, I only want to observe that despite some differences, these two chapters represent a common—

and pioneering—effort. On the one hand, both chapters rely on the basic causal model offered by Becker, defining addiction in terms of habit formation and internalities. On the other hand, both replace Becker's assumption of exponential discounting with one of nonexponential discounting. The main differences are, first, that the chapters use different models of nonexponential discounting and, second, that they make different assumptions about how a sophisticated nonexponential discounter would behave. Note, however, that these two differences are entirely unrelated. As argued by Strotz (1955) and corrected in Pollak (1968), someone who discounts the future hyperbolically might well respond by taking his or her future choices as parameters for the current decision problem. Conversely, the strategy of bunching would presumably also be feasible for someone who discounts the future in a quasi-hyperbolic way. I am unaware, however, of any attempt to explore that issue.

Self-Control and Treatment

In his chapter, Watson argues against the common view that addicts are unable to control themselves because of an overpowering or compulsive desire for the drug. He does not exclude that addicts can find it hard to resist temptation but places the emphasis "not on the power of addictive desires to defeat our best efforts but on its tendency to impair our capacity to make those efforts." As he also notes, in yielding to temptation "we are not so much overpowered by brute force as seduced." I might add that the seduction operates in part through the belief that the desire is overpowering, so that any resistance will be fruitless.

Watson makes a compelling case against the argument that addicts cannot overcome their problem by sheer, unassisted willpower. Yet as a matter of fact, most addicts do not quit just by making a decision to stop consuming. Naive addicts may think they can achieve abstinence in this way, but they typically slip into relapse. They may then resort to more complicated cognitive or behavioral strategies—or seek treatment. Earlier, I mention two cognitive strategies available to sophisticated addicts: (1) treating one's future decisions as parameters for one's current problem and (2) bunching successive choices together in one overall choice between always consuming and always abstaining. These strategies, as noted, may not always work and could even make things worse.

Behavioral strategies include a number of precommitment devices: making the drug physically unavailable or available only with a delay, imposing additional costs on its use, and avoiding environments that might trigger a cue-dependent relapse. Addicts can also enlist other people as agents to protect them against themselves. In Colorado, a physician may write a letter to the State Board of Medical Examiners, to be sent in

case he tests positive for cocaine, confessing that he has administered cocaine to himself in violation of the laws of Colorado and requests that his license to practice be revoked (Schelling 1992).

These cognitive or behavioral strategies of self-control may not work, however, either because of the intrinsic problems just discussed or because they are too fragile to cope with sudden and intense drug cravings. In that case, treatment may be an alternative. There is a wide range of drug treatments. The main thing they have in common is that they rarely work. In my chapter, I suggest that some of them may even make things worse. In her chapter, Acker shows the moralizing middle-class biases in early twentieth-century opiate treatment, one doctor comparing addicts to "little men who endeavor to lift themselves into greatness by wearing 'loud' clothes or by otherwise making themselves conspicuous, when effacement would be more becoming."

In his chapter, Gardner discusses the conceptual possibility and plausible realization of a drug-based form of treatment. He draws on work suggesting that parts of the population have an inborn or acquired reward-deficiency syndrome, which induces novelty seeking and sensation seeking, in general, and drug taking more specifically. To counteract this deficiency he suggests the technique of *dopamine substitution,* by which brain reward in individuals with naturally low levels of dopamine could be enhanced artificially by a nonaddicting drug. The crucial idea is to find a drug that (like cocaine) blocks the dopamine reuptake transporter but that has "a much slower onset of action and much longer duration of action" and hence does not produce the sudden rush that makes cocaine so attractive.

Beyond Addiction

Some of the contributions to the present volume go beyond addiction to discuss appetites, emotions, and visceral factors more generally. In my own chapter I attempt a systematic comparison of addiction and emotion, arguing that both should be seen in the triple perspective of neurobiology, culture, and choice. If taken in isolation, each of these approaches can give rise to a dangerous form of reductionism. If combined, they allow us to see these phenomena as partly shaped by individual choice and social pressure but always within hard neurophysiological constraints. I also discuss some salient differences and similarities between the phenomena of addiction and emotion. Let me highlight only one difference. To the extent that addictive cravings are triggered by encounters with the external world, they depend mainly on perceptual cues. Emotions, by contrast, depend much more heavily on beliefs.

In Ainslie's chapter he defends a view he develops at greater length elsewhere (Ainslie 1992) against a rival theory offered by George Loewenstein (1996, 1999). Both theories go beyond addiction to include other visceral motivations, such as emotions, hunger, and even pain. Roughly speaking, Loewenstein argues that these states are triggered by external cues, whereas Ainslie argues that they are triggered by the prospect of reward. In my opinion, there is no question that Loewenstein's theory captures important features of addiction, emotion, and the like. The issue is whether it also provides an explanation of these phenomena or, as Ainslie argues, merely a redescription of them. The fact that, phenomenologically, pain, hunger, anger, and addictive cravings are experienced as involuntary rather than chosen does not exclude, Ainslie argues, that they are ultimately governed by reward.

Ainslie's theory is satisfying because of its coherence and parsimoniousness. It is, however, vulnerable to the objection of being speculative and based on inferences and extrapolations rather than on direct empirical evidence. Rather than taking a side on that issue, I only adduce some empirical illustrations that may help to bring the debate into clearer focus.

The question of whether cravings are in fact shaped by reward or by exposure to cues might be amenable to empirical resolution, by considering Ainslie's example of Jewish smokers who are able to abstain on the Sabbath. In principle, one should be able to determine whether the craving subsides because of the lack of exposure to other smokers who might trigger it or because of the belief that the craving, were it to arise, would not be satisfied. Cravings can, in fact, be cue dependent as well as belief dependent, as illustrated by two stories told by Avram Goldstein (1994, 222). The first is

> a convincing story from a colleague who had been a nicotine addict but hadn't smoked for years. He had abstained from cigarettes in a variety of situations where he had smoked in the past, and thus he had desensitized himself to a variety of conditioned associations—cigarettes at parties, cigarettes at morning coffee, cigarettes at the desk, and so on. One day he went to the beach and was suddenly overwhelmed by an intense craving to smoke. He found this beyond understanding until he realized that smoking on the beach had been an important pattern at one time in his life, and that he had not had the opportunity to eliminate that particular conditioned association.

The second story concerns "the nicotine addict who goes skiing for a whole day, leaving cigarettes behind. No thought is given to cigarettes—they are simply unavailable. Then back at the lodge, where nicotine is available again, intense craving strikes, and the addict lights up." Although Goldstein does not specify whether cigarettes were *visible* or

merely *known to be available* at the lodge, the first couple of sentences suggest the latter. In that case, we are close to Ainslie's interpretation of the Sabbath phenomenon.

The disagreement between Ainslie and Loewenstein can also be stated in terms of cue-dependent craving versus hyperbolic discounting. Ainslie writes in his chapter that "both people and animals have a robust tendency to discount the future hyperbolically. In that case, external stimuli should not be needed to either impose or release emotions. A small amount of immediate reward will be enough to lure someone into a process that is quite unrewarding over time." The difference between the two views may be illustrated by an example suggested by Loewenstein (personal communication). Suppose I have a tendency, which I deplore— to order rich desserts at restaurants. To control myself, I can choose my restaurant according to one of two precommitment strategies. On the one hand, I can decide to go to a restaurant where I have to order dessert at the beginning of the meal. This would help me overcome my problem of time inconsistency, if that is what I am fighting. On the other hand, I can opt for a restaurant in which they do not go around with the dessert trolley but in which dessert instead has to be ordered from the menu. This would help me overcome my problem of cue-dependent craving, if that is what I am fighting.

Ultimately, however, the disagreement between Ainslie and Loewenstein cannot be resolved at this level. Examples may be suggestive, but they cannot substitute for demonstration. Whether pain, hunger, anger, and cravings are reward-governed behaviors or arise involuntarily from cues in the environment is a question that can be settled only by examining the reward circuits in the brain. One of the lessons we can draw from Gardner's chapter is that the complexity of those circuits is such that the debate will not be resolved any time soon.

References

Ainslie, George. 1992. *Picoeconomics.* Cambridge: Cambridge University Press.

Becker, Gary. 1996. *Accounting for Tastes.* Cambridge, Mass.: Harvard University Press.

Becker, Gary, and Casey Mulligan. 1997. "The Endogenous Determination of Time Preference." *Quarterly Journal of Economics* 112: 729–58.

Becker, Gary, and Kevin Murphy. 1988. "A Theory of Rational Addiction." *Journal of Political Economy* 96: 675–700.

Bratman, Michael. 1995. "Planning and Temptation." In *Mind and Morals,* edited by L. May, M. Friedman, and A. Clark. Cambridge, Mass.: MIT Press.

Elster, Jon. 1997. "Review of Becker (1996)." *University of Chicago Law Review* 64: 749–64.

Gardner, Eliot, and James David. 1999. "The Neurobiology of Chemical Addiction." In *Getting Hooked: Rationality and the Addictions,* edited by Jon Elster and Ole-Jørgen Skog. Cambridge: Cambridge University Press.

Goldstein, Avram. 1994. *Addiction.* New York: Freeman.

Herrnstein, Richard, and Drazen Prelec. 1992. "A Theory of Addiction." In *Choice over Time,* edited by George Loewenstein and Jon Elster. New York: Russell Sage Foundation.

Laibson, David. 1996a. "A Cue Theory of Consumption." Manuscript, Department of Economics, Harvard University.

———. 1996b. "Hyperbolic Discount Functions, Undersaving, and Savings Policy." NBER Working Paper 5635. Cambridge: National Bureau of Economic Research.

Levine, Harry. 1978. "The Discovery of Addiction." *Journal of Studies on Alcohol* 39: 143–74.

Loewenstein, George. 1996. "Out of Control: Visceral Influences on Behavior." *Organizational Behavior and Human Decision Processes* 65: 272–92.

———. 1999. "A Visceral Theory of Addiction." In *Getting Hooked: Rationality and the Addictions,* edited by Jon Elster and Ole-Jørgen Skog. Cambridge: Cambridge University Press.

Orphanides, Athanasios, and David Zervos. 1995. "Rational Addiction with Learning and Regret." *Journal of Political Economy* 103: 739–58.

———. 1998. "Myopia and Addictive Behavior." *Economic Journal* 108: 75–91.

Phelps, Edmund, and Robert Pollak. 1968. "On Second-Best National Saving and Game-Theoretic Equilibrium Growth." *Review of Economic Studies* 35: 185–99.

Pollak, Robert. 1968. "Consistent Planning." *Review of Economic Studies* 35: 210–18.

Schelling, Thomas. 1992. "Self-Control." In *Choice over Time,* edited by George Loewenstein and Jon Elster. New York: Russell Sage Foundation.

Skog, Ole-Jørgen 1997. "The Strength of Weak Will." *Rationality and Society* 9: 245–71.

———. 1999. "Rationality, Irrationality, and Addiction: Notes on Becker and Murphy's Theory of Addiction." In *Getting Hooked: Rationality and the Addictions,* edited by Jon Elster and Ole-Jørgen Skog. Cambridge: Cambridge University Press.

Strotz, R. 1955. "Myopia and Inconsistency in Dynamic Utility Maximization." *Review of Economic Studies* 23: 165–80.