

In: STUDIES IN ECONOMIC  
RATIONALITY.

X-EFFICIENCY EXAMINED  
AND EXTOLLED.

KLAUS WEIERHAIR and  
MARK PERLMAN (eds.)

THE UNIVERSITY OF MICHIGAN  
PRESS, ANN ARBOR, 1990,

p. 71-93.

## Human Behavior: Ipsative and Objective Possibilities

*Bruno S. Frey*

### Humans are Imperfect

Human beings sometimes act in a way that an outside observer may find difficult to understand. This article is concerned with two areas of paradoxical behavior. The first area is characterized by the fact that individuals regularly and systematically overestimate their possibility set: they think that they can accomplish more than is objectively possible. Examples are scholars who when writing a book or a paper tend to overestimate their work capacity, realizing as time unfolds that they need much more time to complete the scientific work.<sup>1</sup> Similarly, most business people regularly overcommit their time. Both scholars and business people regret overestimating their work capacity when the time to deliver arrives, but they repeatedly fall into the same trap. The foregoing examples were chosen to make it clear that such overestimation of one's possibilities is not due to inexperience, false information, or lack of intelligence.

Additional examples of overestimates of what is objectively possible are the illusion that the divorce rate does not apply to one's own marriage, or that accident rates in hazardous jobs or sports are irrelevant when a person engages in them himself or herself. Divorces and accidents are presumed to happen to others.

---

This work is part of an attempt to integrate economic and psychological approaches to behavior, jointly undertaken with psychologist Klaus Foppa of the University of Bern (see Foppa 1987; Frey and Foppa 1986). I am solely responsible for this particular article. Helpful comments by Charles Beat Blankart, Reiner E. Eichenberger, Beat Gygi, Beat Heggli, Gebhard Kirchgässner, Barbara Krug, Werner W. Pommerehne, Friedrich Schneider, Raphaela Schuster and Hannelore Weck-Hannemann are gratefully acknowledged. Oded Stark has made valuable comments concerning content and style. The author also benefited from the discussion at the Bellagio conference. A preliminary version of this article was presented at the *Rencontre de Kirchberg*, February 1988.

1. I also had this experience in writing this article.

The second area of paradoxical behavior is characterized by exactly the converse fact: individuals systematically underestimate the objective possibilities, i.e., they do not exhaust the possibility set available to them. An example is persons who never attend an opera performance though they can well afford to in terms of time and money, are well informed about the opportunity, and are characterized by outside observers as the type who would enjoy opera (as indeed they do if for some reason they happen to attend a performance). Another example of such underestimation of the objective possibility set is the decision not to buy a TV set (by a person who can well afford such a purchase) because one knows that one enjoys watching television. The same behavior is manifested when one decides not to start smoking, drinking, or taking drugs though one knows perfectly well that one will like it once started. Yet another example would be young people who decide against a management career though they know that once undertaken they would enjoy it.

The systematic overestimation or underestimation of one's possibility set is difficult or impossible to reconcile with the spirit of orthodox economic theory, and in particular with its central tenet, the relative price effect. This article endeavors to provide a simple and straightforward explanation of these paradoxes by differentiating between an *objective* possibility set and an *ipsative* possibility set, which is defined by the *personal* view about the possibilities. An effort is made to formulate testable propositions and to provide empirical evidence incompatible with the orthodox economic model of behavior such as that expounded by Stigler and Becker (1977). It is argued that awareness of the differences is relevant for attempts to influence human behavior through economic policy. Identifiable instances exist where an orthodox economic policy carried out by control of relative prices yields a counterproductive outcome.

The approach used here remains within the rational choice framework (and even within utility maximization), i.e., the results are not gained by assuming any kind of irrationality, or an arbitrary or unexplained shift of preferences. Rather, the economic approach to explaining human behavior is exploited more fully by differentiating between two basically different kinds of possibility sets.

### Objective and Ipsative Possibility Sets

Individuals do not view the alternatives available to them as binding: some alternatives are considered that are objectively impossible, while

other alternatives that are possible are disregarded.<sup>2</sup> The possibility set that a particular individual takes to be relevant for himself or herself—the ipsative possibility set (IPS)—differs from the objective possibility set (OPS). The difference does not lie in the fact that individuals have limited information or intelligence: these factors account for the difference between the objective and the subjective possibility set (a difference that is well known in economic theory and will therefore not be discussed here). An important feature of the difference between the ipsative and the objective possibility sets is that there is no tendency over time for the difference to narrow; rather, the difference can be maintained over long periods, and there are even circumstances in which it increases.

The two possibility sets differ in four major respects:

1. The objective possibility set is *marginal*. Small changes can be meaningfully evaluated in terms of benefits and costs. The ipsative possibility set, on the other hand, is nonmarginal or *absolute*. Alternatives are considered either in full or not at all.
2. OPS is *symmetric*. An increase or a decrease in relative prices have in principle the same effect; the sign may be positive or negative. IPS is *asymmetric*. Alternatives outside the ipsative set are beyond consideration, irrespective of how relative prices change. However, for alternatives inside the ipsative set the normal relative price effects obtain.
3. OPS is *transpersonal*. A (benevolent) outside observer who is well informed about an individual's marginal utility and marginal costs would suggest exactly those actions that the informed individual would choose. IPS is *personal*: the environment is looked at from a point of view relevant only for the particular individual. Consequently, a (benevolent) outside observer would often suggest actions different from the ones undertaken by the individual concerned.
4. OPS assumes that a *choice* between alternatives can be made, based on expected utility maximization. Accordingly, a change in relative prices has a systematic effect on behavior according to the fundamental law of demand. IPS assumes that there are cases in which no (direct) choice between alternatives is possible as autonomous processes prevent a choice being made. Individuals

---

2. In a different context, Simon has called on social scientists "to provide . . . for the limited span of attention that governs *what* considerations, out of the whole host of possible ones, will actually influence the deliberations that precede action" (1985, 302).

have *limited control* between alternatives, and a real choice can be made only by moving to the (constitutional) level where rules may be adopted.

Expected utility maximization theory, which is “the major paradigm in decision making since the Second World War” (Schoemaker 1982, 529), starts from a given set of feasible alternatives. All alternatives belong to the objective possibility set, and the theory is used to arrive at the best choice among alternatives in a risky environment. As Einhorn and Hogarth (1986, 247) state, this theory is completely in the framework of a lottery: “The study of risk has been dominated by a simple metaphor—the explicit lottery with stated probabilities and payoffs.”

In economics, expected utility maximization is the standard approach when dealing with uncertainty. Examples may be found in books on public economics (e.g., Atkinson and Stiglitz 1980, or all issues of the *Journal of Public Economics*), where, for example, the decision whether to pay taxes or cheat, or whether to work in the official economy or in the shadow economy, is formulated in terms of expected utility maximization (e.g., Allingham and Sandmo 1972; Sandmo 1976). In these studies it is clear that the set of alternatives is given and fully specified, though not necessarily completely known to the individuals who are choosing. In addition to optimal taxation, the same approach is used in the neoclassical theory of public pricing (e.g., Boes 1981). Expected utility maximization is also used when the economic approach is applied to more general social problems (see Becker 1976; McKenzie and Tullock 1975).

Recently, experimental psychologists, among them Kahneman, Tversky, Slovic, and Lichtenstein (see e.g., Frey 1983; Hogarth and Reder 1987; Kahneman, Slovic and Tversky 1982) have found that a large number of paradoxical types of behavior exist that strongly argue against expected utility maximization as an explanatory model: “at the individual level most of the empirical evidence is difficult to reconcile with the principle of expected utility maximization” (Schoemaker 1982, 530). These findings also relate to real world behavior, as will be subsequently shown. Thus, for example, “Managers commonly attempt to adjust risky alternatives rather than simply choosing among them” (MacCrimmon and Wehrung 1986, 1988; see also March and Shapira 1987).

It might be properly concluded that the accepted approach of dealing with decision making under uncertainty fails to explain many phenomena observable at the individual level as well as at the aggregate level (see Frey and Eichenberger 1989). A new approach is needed that takes

the alternatives entering into choice not as exogenously given but rather as part of an endogeneous process of choice.

### Overestimation of the Ipsative Set

In the simplified case of two activities or goods  $X$  and  $Y$ , an overestimation is graphically shown in figure 1.

The objective possibility set is given by  $ODC$ , the larger ipsative possibility set by  $OEF$ . The maximum achievable utility level  $U_o$  is reached at  $P_o$ , but the individual concerned believes that utility  $U^d$  can be reached at  $P^d$ . The shaded area  $A$  indicates the overestimation area.

Two instances of overestimation will be discussed: (1) overestimation due to human nature, and (2) overestimation due to design.

#### Overestimation Due to Human Nature

There is a tension or conflict between point  $P^d$  that is desired but not objectively feasible, and  $P_o$  that is feasible but not the most desirable. If such an incompatibility were typical only of mentally ill persons or the result of a temporary error, the incompatibility would not have much relevance for economics. However, such an overestimation happens in many situations for perfectly normal, rational individuals, and there is no tendency for the ipsative possibility set to converge to the objective set. Nonadjustment exists because "reality" can be "constructed" in many different ways. Thus, OPS is not given but rather is the result of an interpretive process of an actor. The interpretation varies according to the context (see Tversky and Kahneman 1981) as well as according to the frame (Tversky and Kahneman 1973), i.e., psychological factors may determine the relevant problem space (Newell and Simon 1972; Schoemaker 1980).

Overestimation is particularly relevant when uncertainty is present. In this setting, an individual always finds it possible to associate himself or herself with another domain so that the experience of others becomes irrelevant from the individual's personal point of view. This ipsative probability may deviate systematically and in the long run from what in the literature is known as objective and subjective probability (see de Finetti 1968; Savage 1954): there is a tendency to underestimate negative events and to overestimate positive events. Under some circumstances, there is "a surprising . . . failure of people to infer from lifelong experience" (Kahneman, Slovic, and Tversky 1982, 18; see also Hogarth 1975). Rather, there is a "judgemental bias: people . . . [have a] predilection to view themselves as personally immune to hazards" (Fischhoff et al. 1981,

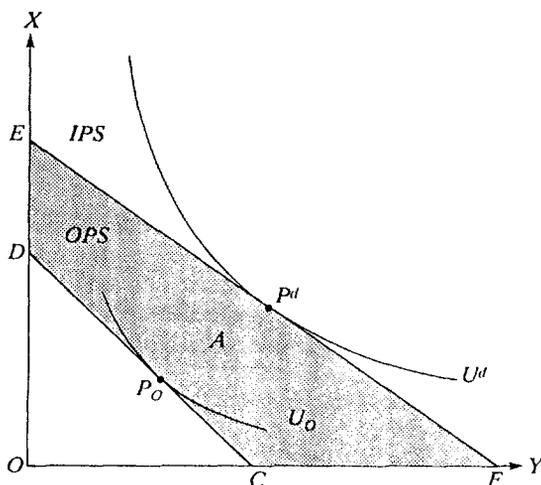


Fig. 1

29–30). According to Weinstein's findings (1980, 806) individuals are subject to "unrealistic optimism," i.e., they "tend to think they are invulnerable. They expect others to be the victims of misfortune, not themselves" (Kirscht, Haefner, Kagelas, and Rosenstock 1966).

The underestimation of negative and the overestimation of positive events have been empirically shown to hold in the following areas (to name but a few):

*Cancer and other diseases.* Even if people are well aware of the probability of getting cancer, they still tend to assume that it will afflict others but not themselves. More generally, most people believe that they are more likely than the average person to live beyond 80 years of age (Weinstein 1979). That this is objectively impossible does not induce individuals to think otherwise.

*Car, sport, and work accidents.* The great majority of individuals consider themselves to be better-than-average drivers (Svenson 1978). Each one experiences trip after trip without accident and then tends to interpret this as evidence of an exceptional driving skill. They also believe that they are less likely than the average person to be injured by the working tools they operate (Rethans 1979), and they conceive hazardous occupations to be of little risk.

*Natural disasters.* People are aware of the fact that floods and

earthquakes may happen but assume that they will be less affected than others.

*Divorce.* Even if individuals are aware of the substantial risk of divorce, they tend to believe that the given risk applies to others not to their own marriage.<sup>3</sup>

*Crime.* People may know the statistical incidence of crime but still think that crime will affect the others.

Table 1 reproduces empirical evidence, based on a controlled survey, that the overextension of the ipsative set is a common feature in the areas listed above. Most of the events refer to diseases; people obviously have a very strong tendency to exclude themselves from the base of the population as a whole and to put themselves in another category ("I belong to a particularly healthy set of people"). But in all cases the underestimation of negative and the overestimation of positive events (in table 1 "living past 80") mean that the ipsative is larger than the objective possibility set:

TABLE 1. Unrealistic Optimism for Future Life Events

Event	Mean Comparative Judgment of Own Chance versus Others' Chances (in percent) <sup>a</sup>
Having a drinking problem	-58.3***
Attempting suicide	-55.9***
Divorcing a few years after marriage	-48.7***
Having a heart attack before age 40	-38.4***
Contracting venereal disease	-37.4***
Getting lung cancer	-31.5***
Being sterile	-31.2***
Having a heart attack	-23.3***
Living past 80	12.5**
Tripping and breaking bone	- 8.3*
Having car stolen	- 7.3
Being a victim of mugging	- 5.8

Source: Weinstein (1980, 810).

<sup>a</sup>In making a comparative judgment, students estimated the difference in percentage between the chances that an event would happen to them and the average chances for other same-sex students at their college.  $N = 123$  to  $130$ , depending on rating form and missing data. Student's  $t$  was used to test whether the mean is significantly different from zero.

For positive events, the response that one's own chances are greater than average is considered optimistic, and the response that one's own chances are less than average is considered pessimistic. For negative events, the definitions of optimistic and pessimistic responses are reversed.

\* $p < 0.05$  \*\* $p < 0.01$  \*\*\* $p < 0.001$

3. This may be called the Elizabeth Taylor Effect: whenever she gets married, and this is often the case, she proclaims in good faith that this time it is for life—only to be divorced some time later.

the constraints in terms of monetary and nonmonetary resources are discounted by individuals when they consider their own situation. Such an overextension of the ipsative possibility set would be of little consequence for economics if it were simply in the sphere of evaluation. But it also has an important influence on behavior. For this purpose, the behavioral consequences in the five areas already listed will be sketched and empirical evidence quoted.

*Diseases.* Individuals tend to undergo too few tests to determine the presence of cancer (American Cancer Society 1966) and generally tend to behave as if they will live forever (as a popular saying goes), for example, a large number of people refrain from writing a last will.

*Accidents.* As may easily be tested by asking someone who participates in a hazardous sport whether he or she considers it to be dangerous, there is a standard reply: the accidents are attributed to insufficient training, to recklessness, or to bad equipment. This is illustrated by the following report:

A New York graffitist who had been badly burned in an electric fire started by a spark that ignited his cans of spray paint . . . admitted that 2 weeks before his accident he read of a boy named Bernard Brown who was crushed to death while painting graffiti on trains. . . . He said "I remember laughing about it thinking he must be some kind of dude who didn't know what he was doing." (Nisbett, Borgida, Crandall, and Reed 1982, 116)

As a consequence, individuals tend to be careless, e.g., people are generally reluctant to wear seat belts in cars even while admitting that they are useful in the event of accidents (Robertson 1974), and they tend to insure too little (Robertson 1977). Those employed in hazardous occupations systematically act as if their work were not risky and tend not to use the safety equipment available voluntarily (Akerlof and Dickens 1982). People have an illusion of control: while they sometimes pay lip service to the concept of chance, they behave as if chance events can be controlled (Langer 1982; Van Raaij 1985). The same illusion is true of managers. They do not accept the idea that the risks they face are inherent in their situation (Strickland, Lewicki, and Katz 1966); rather, they make an effort to use their skills to control the risks (Adler 1980; Keyes 1985; March and Shapira 1987; Shapira 1986).

*Natural disasters.* There is convincing empirical evidence (Kunreuther 1976; Kunreuther et al. 1978) that even if extremely attractive flood and earthquake insurance is available (the federal government subsidizes it up to 90 percent), the large majority does not make use of it

(not even those who do not speculate on help by government in the case of a disaster). The fundamental bias discussed thus induces behavior that an outside observer would have to evaluate as contrary to subjective utility maximization.

*Divorce.* Today more than ever, people enter into marriage with very little preparation. Few make an appropriate marriage contract or make early preparations for a possible divorce (because such acts are interpreted as evidence of lack of love). When a couple divorces, one of them often remarries, with the result that divorced persons remarrying are likely to divorce again. No learning effect takes place but rather the contrary: while first marriage rates have shown a steady decline, divorce rates and remarriage rates have climbed (Bianchi and Spain 1986, 38-39).

*Crime.* People living in high crime areas (and not emigrating) tend to disregard this fact, probably in order to decrease their psychic cost or cognitive dissonance (see Akerlof and Dickens 1982). As a consequence, they tend to become less careful than a (benevolent) outside observer would advise.

This discussion suggests that the extension of the ipsative set beyond the objective possibility set affects human behavior in a significant way.<sup>4</sup> According to this view, Becker's statement "Even irrational decision units must accept reality and could not, for example, maintain a choice that was no longer within their opportunity set" (1976, 167) turns out to be only partly true. While the second part of the sentence is obviously true (almost by definition), the first part is not; even rational individuals do not simply "accept reality" but—especially when uncertainty is involved—may maintain a cognition of reality that outside observers consider mistaken, with important consequences for behavior.

#### Overestimation Due to Design

The ipsative may also be extended beyond the objective possibility set as a purposeful device to induce motivation and work effort that would otherwise not be forthcoming. Similar to the Leibenstein (1976, 1978) or Hirschman (1958) view, but contrary to orthodox neoclassics, work intensity is not a given but can be influenced by appropriate personal strategies.

---

4. It should be noted that only a subset of the effects is revealed in individual behavior. Another part is evidenced by institutions created in response to the behavioral consequences of overextending the ipsative set. Thus, in all Western countries, the law requires a marriage contract because individuals tend to refrain from making one themselves.

An example of such behavior has already been given by the scholars who regularly overestimate their work capacity. While they should have the intelligence and experience to know better, they convince themselves otherwise in order to mobilize resources and to complete at least part of a task. Empirical evidence exists that this strategic bias is behaviorally relevant:

Scientists and writers . . . are notoriously prone to underestimate the time required to complete a project, even when they have considerable experience of past failures to live up to planned schedules. A similar bias has been documented in engineers' estimates of the completion time for repairs of power stations (Kidd 1970). . . . This planning fallacy . . . occurs even when underestimation of duration or cost is actually penalized. (Kahneman and Tversky 1979, 314)

#### Underestimation of the Ipsative Set

In the simplified case of the two activities or goods  $X$  and  $Y$ , an underestimation is graphically shown in figure 2. The individual considered is objectively able to reach utility  $U^*$  at point  $P^*$  but does not consider the shaded area  $B$ . His or her ipsative possibility set encompasses only area  $OEF$  so that utility maximization leads to the choice of point  $P_0$  with utility  $U_0$ . To an outside observer, the individual has a utility opportunity loss of  $(U_0 - U^*)$ . However, the individual considered does not experience this loss because the larger objective possibility set  $ODC$  is beyond his own consideration. Empirical evidence exists (Thaler 1980) showing that opportunity costs are indeed treated quite differently from actual costs.

The underestimation of the ipsative set is again not restricted to mentally disturbed people but is a common phenomenon among perfectly rational actors. It seems that most people consider only a rather small part of what is objectively possible. To an outside observer, the life of these people appears to be rather narrow and restricted to a trodden path; obvious possibilities for improving the situation are disregarded.

There is an obvious counterargument, namely, that the people concerned do not consider area  $B$  because they would not be happy there. Such a situation is shown in figure 3 where it is assumed that the quantity  $O\bar{X}$  of activity or good  $X$  is within consideration, but all quantities  $X > \bar{X}$  are beyond consideration.<sup>5</sup> (Note that the utility curves depicted in the

---

5. For example, the individual concerned does not consider drinking more than one bottle of champagne per evening.

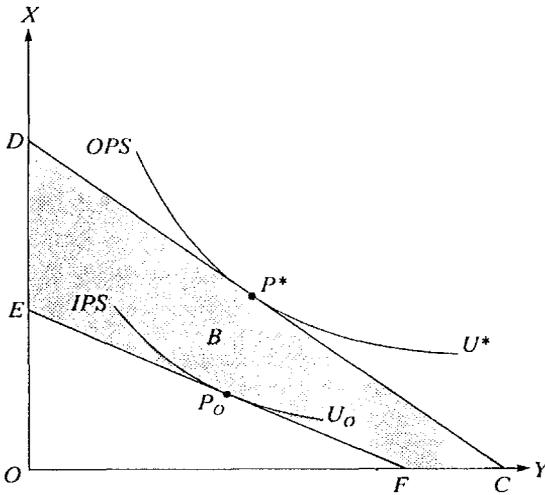


Fig. 2

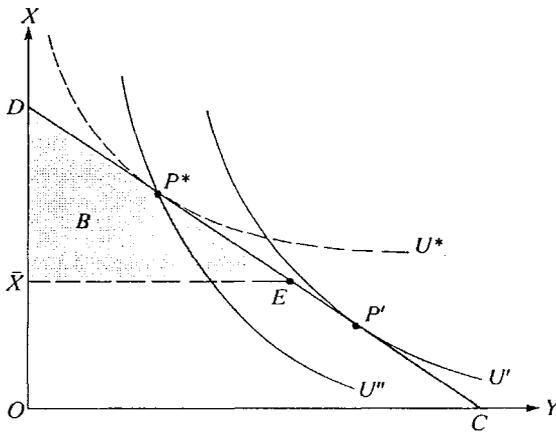


Fig. 3

area  $X > \bar{X}$  are those relating to an individual not subject to an ipsative restriction).

The ipsative possibility set  $O\bar{X}EC$  is a subset of the objective possibility set  $ODC$ , again area  $B$  is not considered by the individual con-

cerned. In this case, point  $P'$  is indeed preferable to  $P^*$  as  $U' > U''$ . Such a situation is perfectly possible but different from what is discussed here. An underextension of the ipsative space means that  $P^*$  is a utility-maximizing equilibrium with a higher indifference curve  $U^*$  tangential to the objective budget line  $DC$ . It is thus argued that the individual concerned would stay at  $P^*$  if area  $B$  were within his or her consideration (e.g., if he or she were forced to include area  $B$ ).

An underestimation of the ipsative set again may occur due to (1) human nature, or (2) design.

#### Underestimation Due to Human Nature

The observation that individuals sometimes disregard obvious possibilities for improving their situation is empirically well founded:

Present research and examples drawn from everyday life show that some kinds of information that the scientists regard as highly pertinent and logically compelling are habitually ignored by people. (Nisbett et al. 1982, 116)

An important example is provided by large investment decisions of firms. The general observation that "individuals look at only a few possible outcomes rather than the whole distribution" (Alderfer and Bierman 1970) also applies to managers considering investment and divestment in multinational corporations: "The search for solutions is 'simple minded,' with the first acceptable alternative being adopted." Schmoelders (1978, 21) found that only 54 percent of industrial corporations in Northrhine-Westphalia took more than one location into consideration, 22 percent restricted the choice to two locations. A similar result is found in an extensive survey of managerial perspectives on risk and risk taking by March and Shapira (1987, 1412). Managers focus on very few aspects and sequentially consider a relatively small number of alternatives (i.e., they "satisfice" [March and Simon 1958; Simon 1955]) or sometimes only a single critical focal value. This evidence suggests that even managers acting under more or less competitive conditions consider only part of the complete objective possibility set and may therefore settle at a point judged by outside observers to be less than optimal.

Why is there not a movement away from the position of lower utility to a feasible one of higher utility, i.e., an extension of the ipsative set toward the objective possibility set? Consider figure 4, which again assumes that  $X > \bar{X}$  is beyond consideration.

An author such as Becker (1962, in particular) would argue that an

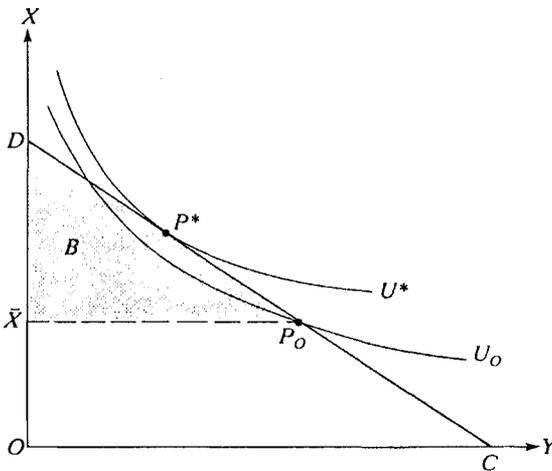


Fig. 4

individual by experiencing marginal improvements in his or her utility would be induced to move from the disequilibrium boundary solution  $P_0$  (where the highest possible utility  $U_0$  within the ipsative set  $OX\bar{X}P_0C$  is reached) toward  $P^*$ . However, such a possibility is simply beyond consideration: the individual concerned does not even imagine moving beyond  $\bar{X}$ ; area  $B$  does not belong to his personal choice set. It is an instance where learning does not take place. Psychologists (e.g., Payne 1982, 397-98) have indeed stressed that learning is neither a simple nor an automatic activity; uncertainty, environmental instability, and improper assessment frameworks represent serious obstacles (e.g., Brehmer 1980; Einhorn 1980). Learning is possible only in a well-structured feedback situation and even then tends to be slow and at times incorrect, or even perverse (Einhorn and Hogarth 1978, 1986). Economists normally simply assert that learning takes place. As one psychologist, Einhorn, states:

The area of learning [is] the focal point for considering the relative merits of psychological versus economic explanations of choice behaviour. Some economists have argued that . . . one will learn the optimal rule through interaction with the environment. Vague assertions about equilibrium, efficiency and evolutionary concepts are advanced to bolster this argument. (1982, 269)

The ipsative theory of behavior allows us to derive empirically testable propositions that are not in line with the normal predictions of orthodox economic theory or that at least point out the great importance of limiting cases.

1. The relative price effect or the law of demand does not work in the circumstances portrayed in figure 4. When the relative price of activities or goods  $X$  and  $Y$  is changed (as in fig. 5, when the relative price changes from  $OD/OC$  to  $OD'/OC'$  or to  $OD''/OC''$ ), the individuals maintain their consumption at  $P_0$  (while  $P^*$  changes to  $P^{**}$  and to  $P^{***}$ ).

An example is attendance at cultural events, such as the opera, concerts, or museums. Some people do not even consider attending such an activity, and, therefore, changing the price of such cultural events has no effect on their attendance. An analysis of four Rotterdam museums reveals, for example, that the rate of first visits is unaffected by price variations, while other visitors show the expected negative price elasticity of demand (Goudriaan and van't Eind 1985, 106). If pricing is used as an instrument for opening museums and other cultural institutions to new groups of visitors, one would have to expect little success. Another example is provided by tax morality that does not seem to be an issue open to marginal evaluation but rather is an issue of principle among taxpayers. Some taxpayers do not ever think of ways and means to cheat on taxes, while others with a low tax morality actively seek to evade taxes, even while taking into account the punishment to be expected if detected. In Switzerland, most citizens seem to belong to the first group, in Germany most seem to belong to the second group. A change in the relative cost of cheating on taxes versus being honest affects only the behavior of the second group. Indeed, such a relative price change may result in a perverse effect: when the government threatens citizens of high tax morality with increased punishments, this may be taken by them as an indication that the government distrusts them, which leads them to distrust the government. The game of mutual trust between citizens and government is then changed into one of opposition, with negative results for all (see also Weck-Hannemann, Pommerehne and Frey 1984). This is an illustration of the second proposition.

2. A relative price change may result in a perverse change in behavior. Consider figure 6. The price of activity or good  $X$  is lowered so that the objective possibility set enlarges from  $ODC$  to  $OD'C$ , and the (irrelevant) equilibrium shifts from  $P^*$  to  $P^{**}$ . Actual consumption moves from  $P_0$  along  $\bar{X}$  to  $P_1$ ; that is, the savings due to a lower price of  $X$  are exclusively used for increasing the consumption of  $Y$ . In this case, a decrease in  $P_X/P_Y$  leads to an increase in  $Y/X$  that is contrary to the spirit

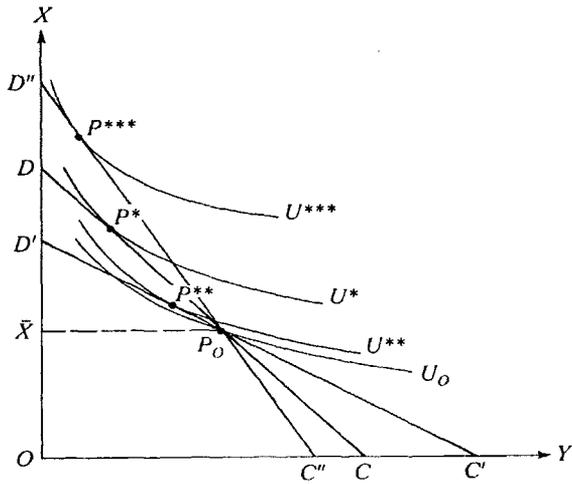


Fig. 5

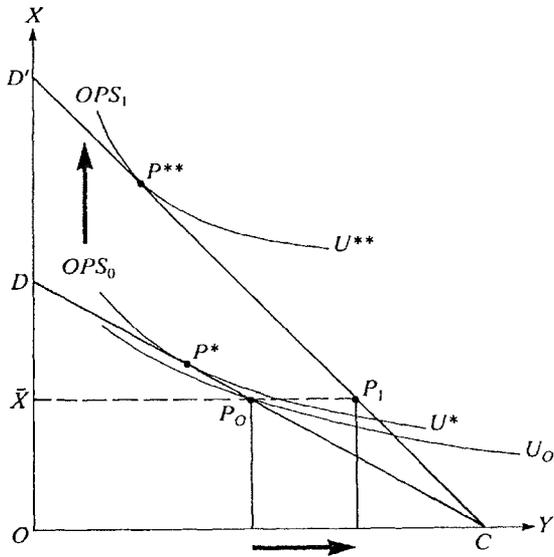


Fig. 6

of neoclassical demand theory (but does, of course, not violate it formally as the perverse reaction is due to an income effect).

#### Underestimation Due to Design

A rather large number of processes exist that an individual knows to be beyond his or her control.<sup>6</sup> Such self-coercive processes are an example of the weakness of will or *akrasia* (Sen 1974, 1979). Coercive processes or compulsory consumption (Winston 1980) where no marginal choice is possible may be of three kinds.

1. *Psychic*. Love (*Pamour fou*) and hatred (à la Michael Kolhaas or Ahab) may go so far as to lead to self-destruction of the individual. Equally, friendship and often family ties (at least in the European sense) are of an absolute nature with, at least in principle, complete trust.
2. *Physical*. Addiction on this level ranges from watching television to smoking, drinking, gambling, and drug taking and is characterized by the fact that many, or most, people find it impossible to exercise control at the margin.
3. *Social*. Many professions or careers once entered do not allow free choice to the individuals involved. This is true for prostitution and crime; an exit is difficult and sometimes not possible at all.

Coercive processes have to do with the ipsative possibility set as they are nonmarginal (absolute), asymmetric (entering is different from exiting) and beyond simple control (see sec. 2). They can indirectly be controlled only by moving to another decision-making level where an individual sets rules or constraints for himself or herself. The most famous example is of Ulysses asking his companions to bind him to the mast in order that he not fall prey to the enchanting Sirens. Such behavior is rational in a more general way:

Man is often not rational, or rather exhibits a weakness of will. Even when not rational, man knows that he is irrational and can bind himself against the irrationality. This second-best or imperfect rationality takes care both of reason and passion. (Elster 1979, 111)

---

6. Another reason for underextending the ipsative possibility set by design is that values one cherishes would be destroyed. One does, for example, not want to consider that one may benefit at the expense of one's friends or family. This idea is not explored here.

Such behavior has been discussed in terms such as *strategic precommitment* (Elster 1977, 1982, 1986), *egonomics* (Schelling 1978, 1980), *welfare-improving constraints* (Maital 1986), as well as in other fields (economics, Hirschman 1982; philosophy, Frankfurt 1971; psychology, Ainslie 1975). Neoclassical economics has thus far dealt with this type of behavior in terms of preferences: Strotz (1955-56) envisages preferences as shifting over time; Thaler and Shefrin (1981) and Margolis (1982) distinguish two sets of preferences, one of a "doer" concerned with pursuing current utility and one of a "planner" concerned with lifetime utility who sets the constraining rules.

In the framework of ipsative theory, coercive pressures are analyzed within the two possibility sets distinguished. Consider figure 7, with  $X$  a coercive good if its consumption exceeds  $\bar{X}$ .

The individual knows that a choice of the utility-maximizing point  $P^*$  with utility  $U^*$  cannot be maintained but that he or she moves along the budget line to the maximum possible consumption of  $X$  at  $P^c$  (the movement is indicated by arrows). In this setting it is rational for such a knowledgeable individual not to cross  $\bar{X}$  (though  $P^*$  yields higher utility than  $U_o$ ) because the final consumption at  $P^c$  yields a lower utility  $U^c$  than  $U_o$ . The choice of an ipsative possibility space with  $X < \bar{X}$  is preferable to the objectively possible set even though at  $P_o$  there is marginal disequilibrium.<sup>7</sup>

For such rule followers, two propositions may be advanced (see fig. 6):

1. An increase in the price of the activity or good subject to coercion leads to a perverse effect (a rise in  $P_X/P_Y$  decreases  $Y/X$ ): the real income reduction is used only to decrease the consumption of  $Y$  and leaves  $X$  unchanged.
2. A decrease in disposable income (e.g., by an increase in taxes) reduces only  $Y$ , while orthodox theory assumes for a normal good that both  $X$  and  $Y$  are reduced.

Actions by people captured by a coercive process, on the other hand, are determined solely by the objective possibility set. A price increase of the addictive good  $X$  reduces the consumption of  $X$  because these people can no longer afford to buy quantity  $P_o^c$  but can afford only  $P_1^c$ , as shown in figure 8.

7. The analysis differs from Stigler and Becker's (1977) treatment of addiction because they assume that an individual may always make a marginal choice. They model the coercive process by resorting to human capital accumulated by addictive consumption.

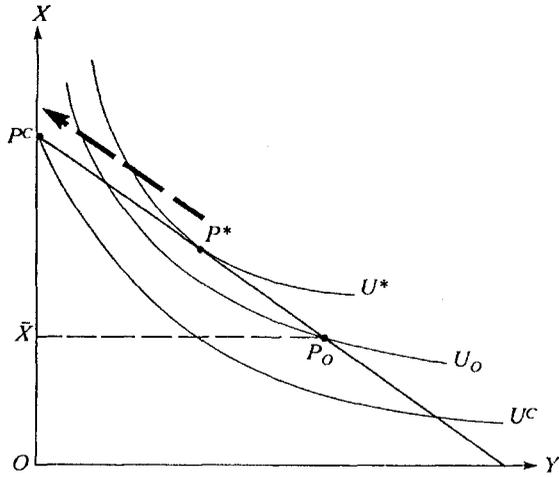


Fig. 7

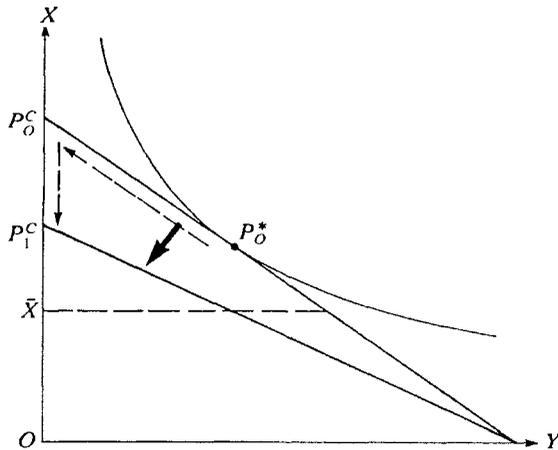


Fig. 8

There is a pure incapacitation effect that works in the same direction as the law of demand.

Society is composed of both rule followers and addicts; the aggregate effect of any policy measure such as a price increase in the addictive

good  $X$  depends on both effects discussed, weighted by the respective share of individuals in the two groups and their income. The share of those following rules and that of those not doing so depends on the net benefit of limiting the ipsative possibility set. The incentive to follow the rule of not exceeding  $\bar{X}$  may be derived from figure 7. The incentive is greater:

1. the lower the utility  $U^c$  of falling prey to the coercive process compared to the utility  $U_o$  of remaining within the ipsative set,
2. the smaller the maximum addictive (temporary) utility level  $U^*$ , and
3. the faster the coercive process from  $P^*$  to  $P^c$  takes place.

These propositions conform to common sense. It is, for example, reasonable that an individual is less likely to stick to a limiting rule if the expected utility from reaching the temporary maximum is large (e.g., to earn great sums of money by a criminal activity).

#### Concluding Remarks

Ipsative theory provides a different point of view for looking at types of human behavior that appear paradoxical at first sight. Clearly, the explanations offered do not contradict orthodox economic theory in the strict sense but only in spirit. Standard neoclassic economics, and, in particular, expected utility maximization, is flexible enough to describe "all observed human behaviour as optimal, provided it is modeled in the appropriate manner" (Schoemaker 1982, 539). In a "postdictive" sense, orthodox theory and ipsative theory are thus not mutually exclusive. The critical criteria for the differential evaluation of theories are whether one theory is more parsimonious, conforms better to common sense, and can more easily be reconciled with empirical observations (without having to add auxiliary assumptions). It is hoped that the ipsative theory of behavior, while staying within the general framework of economic theory by using utility maximization subject to constraints, meets some of these criteria.

#### REFERENCES

- Adler, Stanley. 1980. "Risk Making Management." *Business Horizons* 23:11-14.
- Ainslie, George. 1975. "Specious Reward: A Behavioural Theory of Impulsiveness and Control." *Psychological Bulletin* 82:463-96.

- Akerlof, George A., and William T. Dickens. 1982. "The Economic Consequences of Cognitive Dissonance." *American Economic Review* 72:302-19.
- Alderfer, Clayton P., and Harold Bierman. 1970. "Choice with Risk: Beyond the Mean and Variance." *Journal of Business* 43:341-53.
- Allingham, Michael G., and Agnar Sandmo. 1972. "Income Tax Evasion: A Theoretical Analysis." *Journal of Public Economics* 1:323-38.
- American Cancer Society. 1966. *A Study of Motivational and Environmental Deterrents to the Taking of Physical Examinations That Include Cancer Tests*. New York.
- Atkinson, Anthony G., and Joseph E. Stiglitz. 1980. *Lectures on Public Economics*. Maidenhead: McGraw-Hill.
- Becker, Gary S. 1962. "Irrational Behavior and Economic Theory." *Journal of Political Economy* 70:1-13.
- Becker, Gary S. 1976. *The Economic Approach to Human Behavior*. Chicago: University of Chicago Press.
- Bianchi, Suzanne M., and Daphne Spain. 1986. *American Women in Transition*. New York: Sage.
- Boes, Dieter. 1981. *Economic Theory of Public Enterprise*. Berlin: Springer.
- Brehmer, B. 1980. "In One Word: Not from Experience." *Acta Psychologica* 45:223-41.
- Einhorn, Hillel J. 1980. "Learning from Experience and Suboptimal Rules in Decision Making." In *Cognitive Processes in Choice and Decision Behavior*, ed. Thomas S. Wallsten, 1-20. Hillsdale, N.J.: Erlbaum.
- Einhorn, Hillel J. 1982. "Learning from Experience and Suboptimal Rules in Decision Making." In *Judgement under Uncertainty*, 268-83. See Kahneman, Slovic, and Tversky 1982.
- Einhorn, Hillel J., and Robin M. Hogarth. 1978. "Confidence in Judgment: Persistence of the Illusion of Validity." *Psychological Review* 85: 395-416.
- Einhorn, Hillel J., and Robin M. Hogarth. 1986. "Decision Making under Ambiguity." *Journal of Business* 59:225-50.
- Elster, Jon. 1977. "Ulysses and the Sirens: A Theory of Imperfect Rationality." *Social Science Information* 16:469-526.
- Elster, Jon. 1979. *Ulysses and the Sirens*. Cambridge: Cambridge University Press.
- Elster, Jon. 1982. "Sour-Grapes-Utilitarianism and the Genesis of Wants." In *Utilitarianism and Beyond*, ed. Amartya K. Sen and Bernard Williams, 219-38. Cambridge: Cambridge University Press.
- Elster, Jon, ed. 1986. *The Multiple Self*. Cambridge: Cambridge University Press.
- Finetti, Bruno de. 1968. "Probability: Interpretations." In *International Encyclopedia of the Social Sciences*, vol. 12, ed. D. E. Sills, 496-504. New York: Macmillan.
- Fischhoff, Baruch, Sarah Lichtenstein, Paul Slovic, Stephen L. Derby, and

- Ralph L. Keeney. 1981. *Acceptable Risk*. Cambridge: Cambridge University Press.
- Foppa, Klaus. 1987. "Individual Resources, Objective Constraints, and the Ipsative Theory of Behavior." Psychological Institute of the University of Bern, December. Mimeo.
- Frankfurt, Harry G. 1971. "Freedom of the Will and the Concept of a Person." *Journal of Philosophy* 68:5-20.
- Frey, Bruno S. 1983. "The Economic Model of Behaviour: Shortcomings and Fruitful Developments." Institute for Empirical Economic Research, University of Zurich, June. Discussion Paper.
- Frey, Bruno S., and Reiner E. Eichenberger. 1989. "Should Social Scientists Care About Choice Rationalities." *Rationality and Society* 1:101-22.
- Frey, Bruno S., and Klaus Foppa. 1986. "Human Behavior: Possibilities Explain Action." *Journal of Economic Psychology* 7:137-60.
- Goudriaan, René, and Gerrit Jan van't Eind. 1985. "To Fee or Not to Fee: Some Effects of Introducing Admission Fees in Four Museums in Rotterdam." In *Managerial Economics of the Arts*, ed. Virginia Lee Owen and William S. Hendon, 103-9. Akron, Ohio: Association for Cultural Economics.
- Hirschman, Albert O. 1958. *The Strategy of Economic Development*. New Haven: Yale University Press.
- Hirschman, Albert O. 1982. *Shifting Involvements. Private Interests and Public Action*. Oxford: Martin Robertson.
- Hogarth, Robin M. 1975. "Cognitive Processes and the Assessment of Subjective Probability Distributions." *Journal of the American Statistical Association* 70:271-94.
- Hogarth, Robin M., and Melvin Reder, eds. 1987. *Rational Choice*. Chicago: University of Chicago Press.
- Kahneman, Daniel, and Amos Tversky. 1979. "Intuitive Predictions: Biases and Corrective Procedures." In *Forecasting*, ed. S. Makridakis and S. C. Wheelwright, 313-27. TIMS, Studies in Management Science 12. New York: North Holland.
- Kahneman, Daniel, Paul Slovic, and Amos Tversky, eds. 1982. *Judgement under Uncertainty: Heuristics and Biases*. Cambridge: Cambridge University Press.
- Keys, Ralph. 1985. *Changing It*. Boston: Little, Brown.
- Kirscht, J. P., D. P. Haefner, S. S. Kagelas, and I. M. Rosenstock. 1966. "A National Study of Health Beliefs." *Journal of Health and Human Behavior* 7:248-54.
- Kunreuther, Howard. 1976. "Limited Knowledge and Insurance Protection." *Public Policy* 24:227-61.
- Kunreuther, Howard, Ralph Ginsberg, Louis Miller, et al. 1978. *Disaster Insurance Protection: Public Policy Lessons*. New York: Wiley.
- Langer, Ellen J. 1982. "The Illusion of Control." In *Judgement under Uncertainty*, 231-38. See Kahneman, Slovic, and Tversky 1982.

- Leibenstein, Harvey. 1976. *Beyond Economic Man*. Cambridge, Mass.: Harvard University Press.
- Leibenstein, Harvey. 1978. "On the Basic Proposition of X-Efficiency Theory." *American Economic Review* 68:328-32.
- MacCrimmon, Kenneth R., and Donald A. Wehrung. 1986. *Taking Risks: The Management of Uncertainty*. New York: Free Press.
- McKenzie, Richard, and Gordon Tullock. 1975. *The New World of Economics*. 2d ed. Homewood, Ill.: Irwin.
- Maital, Shlomo. 1986. "Prometheus Rebound: On Welfare-Improving Constraints." *Eastern Economic Journal* 12:337-43.
- March, James G., and Zur Shapira. 1987. "Managerial Perspectives on Risk and Risk Taking." *Management Science* 33:1404-18.
- March, James G., and Herbert A. Simon. 1958. *Organizations*. New York: Wiley.
- Margolis, Howard. 1982. *Selfishness, Altruism and Rationality. A Theory of Social Choice*. Cambridge: Cambridge University Press.
- Newell, A., and Herbert E. Simon. 1972. *Human Problem Solving*. Englewood Cliffs, N.J.: Prentice-Hall.
- Nisbett, Richard E., Eugene Borgida, Rick Crandall, and Harvey Reed. 1982. "Popular Induction: Information Is Not Necessarily Informative." In *Judgment under Uncertainty*, 101-16. See Kahneman, Slovic, and Tversky 1982.
- Payne, John W. 1982. "Contingent Decision Behavior." *Psychological Bulletin* 92:382-402.
- Rethans, A. 1979. "An Investigation of Consumer Perceptions of Product Hazards." Ph.D. diss. University of Oregon. Quoted in *Acceptable Risk*. See Fischhoff, Lichtenstein, Slovic, Derby, and Keeney 1981.
- Robertson, L. S. 1974. *Urban Area Safety Belt Use in Automobiles*. Washington, D.C.: Insurance Institute for Highway Safety.
- Robertson, L. S. 1977. "Car Crashes: Perceived Vulnerability and Willingness to Pay for Crash Protection." *Journal of Community Health* 3:136-41.
- Sandmo, Agnar. 1976. "Optimal Taxation—an Introduction to the Literature." *Journal of Public Economics* 6:37-54.
- Savage, Leonard J. 1954. *The Foundations of Statistics*. New York: Wiley.
- Schelling, Thomas C. 1978. "Egonomics, or the Art of Self-Management." *American Economic Review, Papers and Proceedings* 68:290-94.
- Schelling, Thomas C. 1980. "The Intimate Contest for Self-Command." *Public Interest* 60:94-118.
- Schmoelders, Guenther. 1978. *Verhaltensforschung im Wirtschaftsleben: Theorie und Wirklichkeit*. Hamburg: Rowohlt.
- Schoemaker, Paul J. 1980. *Experiments on Decisions under Risk: The Expected Utility Hypothesis*. Boston: Nijhoff.
- Schoemaker, Paul J. 1982. "The Expected Utility Model: Its Variants, Purposes, Evidence and Limitations." *Journal of Economic Literature* 20:529-63.
- Sen, Amartya K. 1974. "Choice, Orderings and Morality." In *Practical Reason*, ed. S. Koerner, 54-67. Oxford: Oxford University Press.

- Sen, Amartya K. 1979. "Rational Fools: A Critique of the Behavioural Foundations of Economic Theory." In *Philosophy and Economic Theory*, ed. Frank Hahn and Martin Hollis, 87-109. Oxford: Oxford University Press.
- Shapira, Zur. 1986. "Risk in Managerial Decision Making." Hebrew University. Manuscript.
- Simon, Herbert A. 1955. "A Behavioral Model of Rational Choice." *Quarterly Journal of Economics* 69:99-118.
- Simon, Herbert A. 1985. "Human Nature in Politics: The Dialogue of Psychology with Political Science." *American Political Science Review* 79:293-304.
- Stigler, George, and Gary S. Becker. 1977. "De Gustibus Non Est Disputandum." *American Economic Review* 67:76-90.
- Strickland, Lloyd, Roy W. Lewicki, and Arnold M. Katz. 1966. "Temporal Orientation and Perceived Control as Determinants of Risk Taking." *Journal of Experimental Social Psychology* 2:143-51.
- Strotz, Robert H. 1955-56. "Myopia and Inconsistency in Dynamic Utility Maximization." *Review of Economic Studies* 23:165-80.
- Svenson, O. 1978. "Risks of Road Transportation in a Psychological Perspective." *Accident Analysis and Prevention* 10:267-80.
- Thaler, Richard H. 1980. "Toward a Positive Theory of Consumer Choice." *Journal of Economic Behavior and Organization* 1:39-60.
- Thaler, Richard H., and H. M. Shefrin. 1981. "An Economic Theory of Self-Control." *Journal of Political Economy* 89:392-406.
- Tversky, Amos, and Daniel Kahneman. 1973. "Availability: A Heuristic for Judging Frequency and Probability." *Cognitive Psychology* 5:207-32.
- Tversky, Amos, and Daniel Kahneman. 1981. "The Framing of Decisions and the Psychology of Choice." *Science* 211:453-58.
- Van Raaij, Fred W. 1985. "Attribution of Causality to Economic Actions and Events." *Kyklos* 38:3-19.
- Weck-Hannemann, Hannelore, Werner W. Pommerehne, and Bruno S. Frey. 1984. *Schattenwirtschaft*. Munich: Vahlen.
- Weinstein, Neil D. 1979. "Seeking Reassuring or Threatening Information about Environmental Cancer." *Journal of Behavioral Medicine* 16:220-24.
- Weinstein, Neil D. 1980. "Unrealistic Optimism about Future Life Events." *Journal of Personality and Social Psychology* 39:806-20.
- Winston, Gordon C. 1980. "Addiction and Backsliding: A Theory of Compulsive Consumption." *Journal of Economic Behavior and Organization* 1:295-324.