

# IPSATIVE AND OBJECTIVE LIMITS TO HUMAN BEHAVIOR

Bruno S. Frey\*  
University of Zurich

## INTRODUCTION

Human beings are not automatons but weak and fallible, without being irrational. Under some conditions they systematically tend to overestimate what is objectively possible; under other conditions they systematically underestimate what is objectively possible. The ipsative possibility set describing what an individual considers personally possible may overextend or underextend the objective possibility set either unconsciously due to human nature, or consciously by design. The ipsative theory of behavior endeavors to explain anomalies found by psychologists. It partly yields results incompatible with the spirit (although not with the formalism) of neoclassics. In some cases the law of demand is not effective.

## I. ORTHODOX ECONOMICS CHALLENGED

The microeconomic and behavioral bases of orthodox neoclassical economics have been seriously challenged by experimental results derived (mostly) by psychologists over the last few years. The findings that individual behavior systematically violates rationality have caught the attention of many social scientists, among them many economists. The anomalies were first presented to the economic audience by Kahneman and Tversky (1979) in *Econometrics*; the most important essays are collected in Kahneman, Slovic, and Tversky (1982).

At this time, a large number of anomalies of individual behavior are known, some of which have reached the status of "effects": certainty effect, sunk cost effect, endowment effect, and framing effect (see Frey, 1983). A good deal of attention has been given, especially by economists, to the preference-reversal phenomenon, whereas the choice heuristics of availability, representativeness, anchoring or adjustment have in comparison been rather neglected by economists.

---

\*Direct all correspondence to: Professor Bruno S. Frey, Institute for Empirical Economic Research, Kleinstr. 15, CH-8008 Zurich, Switzerland.

It is not necessary to present and discuss those anomalies here. Suffice it to say that they have not only been found and investigated by behavioral psychologists such as Kahneman, Tversky, Slovic, and Lichtenstein, but also by economists such as Thaler (1980, 1985), Grether and Plott (1979) and Kunreuther (with Ginsberg, Miller, et al., 1978; with Slovic, 1978). Indeed, paradoxical counterevidence against Savage's (1954) axioms of rational behavior under uncertainty had been found much earlier; for example, by Allais (1953) and Ellsberg (1961). Excellent surveys exist on the topic: by Slovic, Fischhoff, and Lichtenstein (1977), and Payne (1982) from the point of view of psychology; by Schoemaker (1980, ch. 2, 1982) who analyzes the consequences of these paradoxes for expected utility maximization (which is based on the von Neumann-Morgenstern [1947] axioms and is therefore generally considered to define rationality under uncertainty); or more recently by Shapira (1986) in a more descriptive, and by Machina (1987) in a more formal way.

This article focuses on one such behavioral anomaly of great importance to economics: The systematic overestimation of positively valued events, and the systematic underestimation of negatively valued events. This bias has been empirically shown to hold, for example, in the following areas:

1. *Diseases.* Even if people are well aware of the probability of getting cancer, they still tend to assume that it afflicts others, not themselves. More generally, most people believe that they are more likely than average to live past 80 years of age (Weinstein, 1979). That this is objectively impossible does not induce individuals to think otherwise.

2. *Car, sport, and work accidents.* The great majority of individuals consider themselves to be better-than-average drivers (Svenson, 1978). Each one of them experiences having made 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.

3. *Natural disasters.* People are aware of the fact that floods and earthquakes may happen, but assume they will be less affected than others.

4. *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. 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 shortly thereafter.

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

These examples suggest that individuals do not take the alternatives available to them as binding. Some alternatives are considered that are objectively impossible, other possible alternatives are disregarded. The possibility set that a *particular* individual takes to be relevant for *himself/herself*—called 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 further discussed here). An important feature of the difference between the IPS and the OPS is that there is no tendency over time for the difference to narrow down; rather, the difference can be maintained over long periods of time, and there are circumstances in which it will even increase.

The systematic overextension and underextension 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 of 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 expounded by Stigler and Becker (1977). It is argued that the differences are relevant for attempts to influence human behavior through economic policy. There are even identifiable instances in which an orthodox economic policy via the control of relative prices yields a counterproductive outcome.

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

In both the case of an overextension and an underextension of the IPS two situations will be distinguished. A deviation between the two possibility sets may be due to (1) the not consciously perceived effect due to human psychological traits, and (2) conscious strategic design. As will be seen, our approach is related to Leibenstein's (e.g., 1976, 1984, 1987) effort to introduce new elements into economic theory more consonant with the observable behavior of individuals. In particular, the *ipsative theory of human behavior* allows for the fact that individuals do not always undertake everything that is possible for them. In our theory this is—unlike Leibenstein (e.g., 1985)—not directly attributed to nonmaximizing behavior. Moreover, the theory here suggested also allows for the persistent existence of inert areas, which to a large extent are unaffected by changes in relative prices.

The ipsative limits to human behavior are discussed in Section II. Section III treats the case of an overextension of the ipsative possibility set beyond what is objectively possible. The final Section IV puts the theory in a wider perspective.

## II. IPSATIVE LIMITS TO HUMAN BEHAVIOR

Under many circumstances individuals' actions are not constrained effectively by the objective conditions (objective possibility set OPS) but rather by the set of possibilities that they consider relevant for themselves, that is, by the ipsative possibility set (IPS).

In the simplified case of the two activities or goods  $X$  and  $Y$ , an underextension is graphically shown in Figure 1. The individual considered is objectively able to reach utility  $U^*$  at point  $P^*$  on the boundary of the objective possibility set OPS but does not

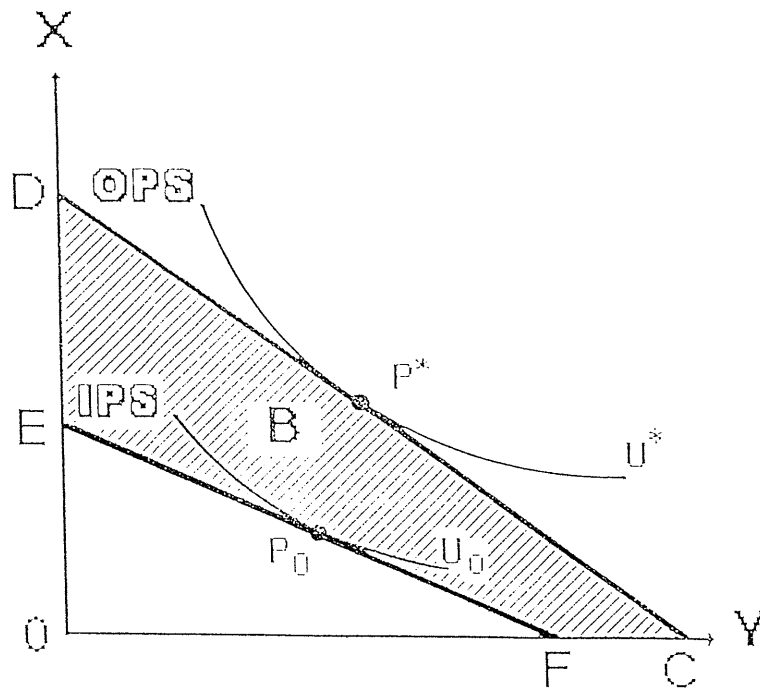


Figure 1. The Ipsative is Smaller than the Objective Possibility Set

consider the shaded area *B*. His or her ipsative possibility set IPS 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 or her own consideration. Empirical evidence exists (Thaler, 1980) that opportunity costs are indeed treated by people quite differently than actual cost.

The underextension 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 moving along a trodden path, and that obvious possibilities for improving the situation are disregarded. This aspect of human behavior has been mentioned by Leibenstein in several of his writings. An underestimation of the ipsative set may happen (A) due to human nature, and (B) due to design.

#### A. Underextension Due to Human Nature

The observation that individuals sometimes disregard obvious possibilities for improving their situation is empirically well founded. 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." Schmoeders (1978, p. 21) found that only half of industrial corporations in Northrhine-Westphalia took more than one location into consideration, one-fourth made a choice between two locations. A similar result appeared in an extensive survey of managerial perspectives on risk and risk taking by March and Shapira (1987, p. 1412). Managers focus on very few aspects, and sequentially consider a relatively small number of alternatives (i.e., there is satisficing, Simon [1955], March and Simon [1958]), and sometimes only one single critical focal value commands all attention. Even managers acting under more or less competitive conditions consider only part of the whole objective possibility set, and may therefore stay at a point judged by outside observers to be suboptimal.

Another example relates to the amount of information gathered by individuals:

[P]resent research and examples drawn from everyday life show that some kinds of information that the scientists regard highly pertinent and logically compelling are habitually ignored by people (Nisbett, Borgida, Crandall, and Reed, 1982, p. 116).

Why is there not a movement from the position of lower utility to a feasible one of higher utility, that is, an extension of the ipsative set toward the objective possibility set? Consider Figure 2 where it is assumed that the quantity  $O\bar{X}$  of activity or good *X* is under consideration, but all quantities  $X > \bar{X}$  are beyond consideration. An example may be an individual who does not consider drinking more than one bottle of wine per evening.

An author such as Becker (1962, in particular) would argue that an 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  $O\bar{X}P_0C$  is reached) toward  $P^*$ . It is argued here, however that 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, pp. 397-398) 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, 1981). Normally economists simply assert that learning takes place, so that one psychologist even sees

... the area of learning [as] 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

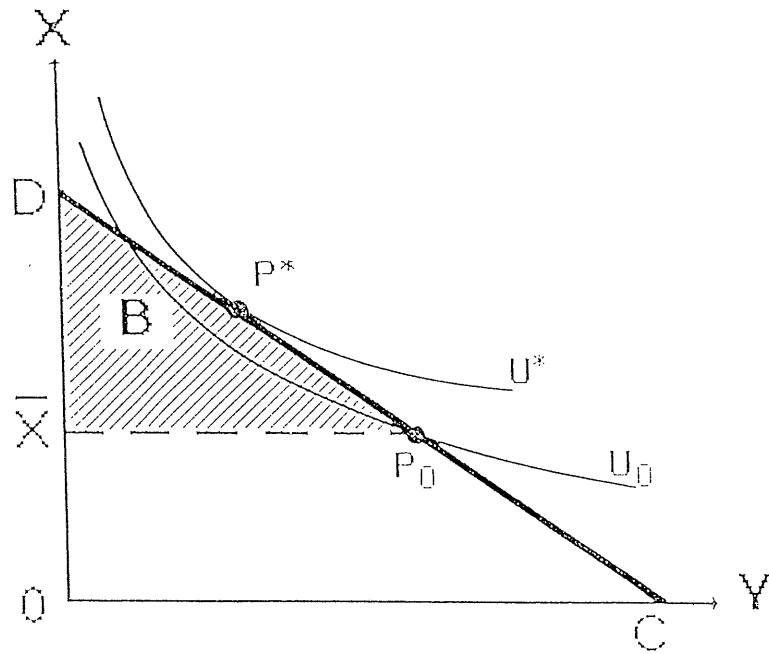


Figure 2. A Position of Higher Utility ( $U^*$ ) is Beyond Consideration

environment. Vague assertions about equilibrium, efficiency and evolutionary concepts are advanced to bolster this argument (Einhorn, 1982, p. 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 which, at least, point out the great importance of limiting cases:

1. The relative price effect or the law of demand does not work. When the relative price of activities or goods  $X$  and  $Y$  is changed (as in Figure 3, when the relative price changes from  $OD/OC$  to  $OD'/OC'$  and to  $OD''/OC''$ ), the individuals maintain their consumption at  $P_0$  (while  $P^*$  changes to  $P^{**}$  and to  $P^{***}$ ). The reason for this "inert area" (Leibenstein) is, of course, that  $P_0$  is a corner solution. The fact that behavior is immune to changes in relative prices is not incompatible with neoclassical theory but it is certainly not in its "spirit." The idea that changing relative prices do affect demand is a major element of neoclassical thinking. Attending cultural events such as the opera, concerts of classical music, or museums is an example. Some people do not even consider 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 ex-

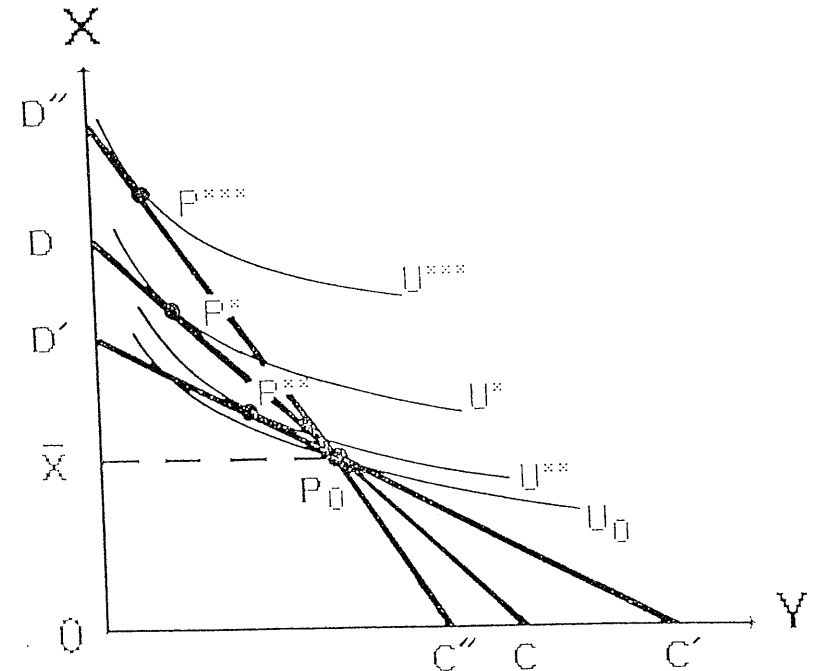


Figure 3. Relative Price Changes Do Not Affect Behavior

ample, 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, p. 106). If pricing is used as an instrument for opening the 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 seem to be an issue not open to marginal evaluation but rather an issue of principle among taxpayers. Some of them do not even think of actively finding ways and means to cheat on taxes, while others with a low-tax morality go as far as possible, taking into account the punishment to be expected if and when detected. In Switzerland, most citizens seem to belong to the first group, in Germany to the second. A change in the relative cost of cheating on taxes versus being honest only affects 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 do likewise. 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:

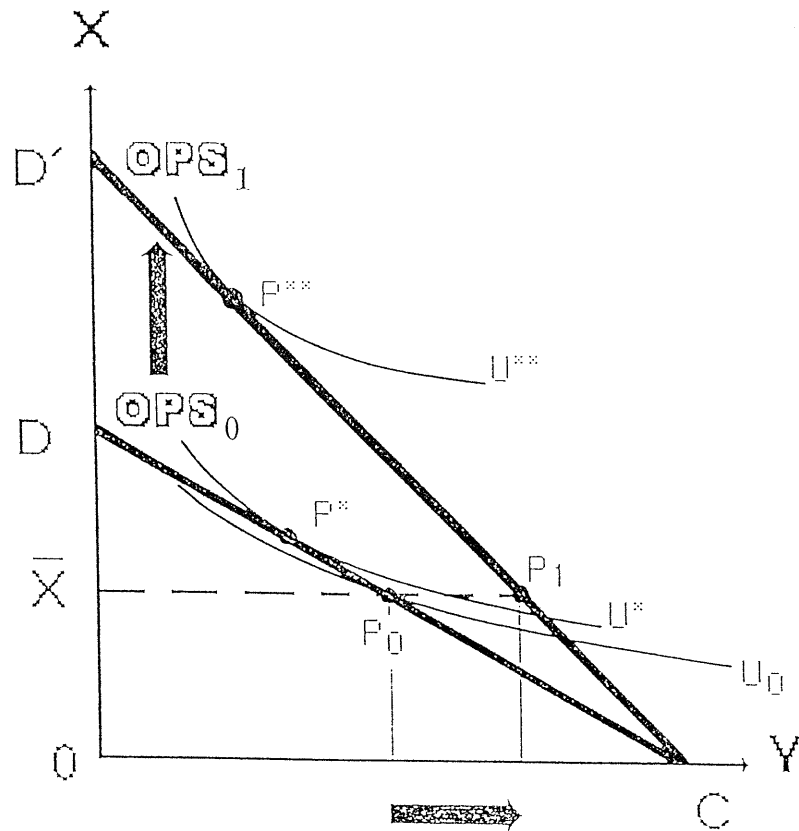


Figure 4. A "Perverse" Effect of a Relative Price Change

2. A relative price change may result in a perverse change in behavior. Consider Figure 4. 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  $Y/X$ , which is, strictly speaking, not incompatible with neoclassics because the increased demand for the good or activity which becomes relatively more expensive is due to the income effect. However, this constellation is certainly not in the "spirit" of what traditional neoclassics would assume when a relative price change occurs.

## B. Underextension Due to Design

A rather large number of processes exist that an individual knows to be beyond his or her control. 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 (*L'amour fou*) and hatred (à la Michael Kolhaas or Ahab) may go so far as to lead to the self-destruction of an individual. Equally friendship and often family bonds (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 it 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 into do not allow free choice to the individuals involved. The same is true of prostitution and crime where an exit is difficult, and sometimes not at all possible.

Coercive processes cannot be directly controlled by the individual in question; they are beyond his or her power. They can indirectly be controlled only by moving to another decision-making level where an individual sets for himself or herself *rules* or *constraints*. A most famous example is Ulysses who asked his companions to bind him to the mast in order not to fall prey to the enchanting Sirens. Such behavior has been discussed as "strategic precommitment" (Elster, 1977, 1982, 1986), "egonomics" (Schelling, 1978, 1980), and "welfare-improving constraints" (Maital, 1986), as well as in other terms (Hirschman, 1982; in philosophy Frankfurt, 1971; in psychology Ainslie, 1975). Neoclassical economics has so far dealt with this type of behavior in terms of preferences: Strotz (1955-1956) envisages preferences 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 5, 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  $\bar{X}$  (although  $P^*$  yields higher utility than  $U_0$ ), because the final consumption at  $P^c$  yields a lower utility  $U^c$  than at  $U_0$ . The choice of an ipsative possibility space with  $X \leq \bar{X}$  is preferable to the objectively possible set even though at  $P_0$  there is marginal disequilibrium. The analysis thus 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.



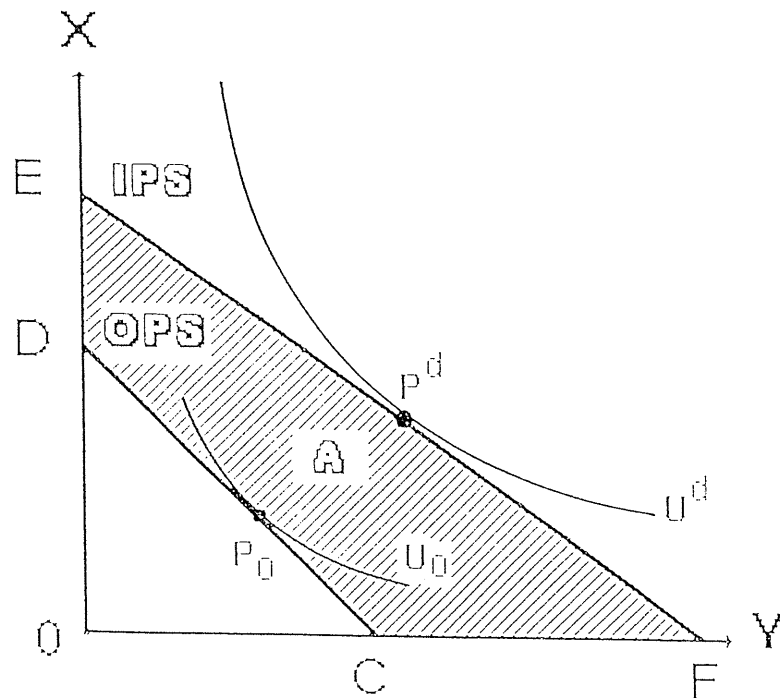


Figure 7. The Ipsative is Larger than the Objective Possibility Set

$P_0$ , but the individual concerned believes that utility  $U^d$  can be reached at  $P^d$ . The shaded area A indicates the overextension area. Again, the two instances of overextension due to human nature (A), and to design (B) are discussed.

#### A. Overextension Due to Human Nature

There is a tension or conflict between point  $P^d$ , which is desired but not objectively feasible, and  $P_0$ , which is feasible but not the most desirable. If such an incompatibility were typical for mentally ill persons only, or the result of an error due to disappear quickly, the incompatibility would not be of much relevance for economics. It is argued here, however, that such an overextension happens in many situations for perfectly normal, rational individuals, and that there is no tendency for the ipsative possibility set to converge to the objective set. Nonadjustment holds 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). That is, psychological factors may determine the relevant problem space (Newell and Simon, 1972; Schoemaker, 1980).

Overextension is particularly relevant to uncertainty. 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 his 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, people stubbornly refuse to learn. There is "a surprising ... failure of people to infer from lifelong experience" (Kahneman, Slovic, and Tversky, 1982, p. 18; see also Hogarth, 1975). Rather, there is a "judgemental bias: people [have a] predilection to view themselves as personally immune to hazards" (Fischhoff, Lichtenstein, Slovic, Derby, and Keeney, 1981, pp. 29-30). According to Weinstein's findings (1980, p. 806) individuals are subject to "unrealistic optimism." That is, they "tend to think they are invulnerable. They expect others to be the victim of misfortune, not themselves" (Kirscht, Haefner, Kagelas, and Rosenstock, 1966).

Table 1 reproduces empirical evidence, based on a survey, that the overextension of the ipsative set is a common feature in the areas discussed in Section I.

Table 1  
Unrealistic Optimism for Future Life Events  
(in Percent)

Event	Mean Comparative Judgment of Own Choice Versus Others' Chances <sup>a,b</sup>
1. Having a drinking problem	-58.3***
2. Attempting suicide	-55.9***
3. Divorced a few years after married	-48.7***
4. Heart attack before age 40	-38.4***
5. Contracting venereal disease	-37.4***
6. Getting lung cancer	-31.5***
7. Being sterile	-31.2***
8. Having a heart attack	-23.3***
9. Living past 80	12.5**
10. Tripping and breaking bone	-8.3*
11. Having your car stolen	-7.3
12. Victim of mugging	-5.8

Notes: <sup>a</sup>In making a comparative judgment, students estimated the difference in percent 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.

<sup>b</sup>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.

\* $p < 0.05$ .

\*\* $p < 0.01$ .

\*\*\* $p < 0.001$ .

Source: Weinstein (1980), p. 810.

Most of the events refer to diseases where 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. In all cases the underestimation of negative events, and the overestimation of positive events (in Table 1 “living past 80”) means that the ipsative is larger than the objective possibility set: 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 areas discussed above will be sketched and empirical evidence quoted:

1. *Diseases*. Individuals tend to have too few cancer tests (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.

2. *Accidents*. As may easily be tested by asking someone who takes part in a hazardous type of sport whether he or she considers it to be dangerous, there is a standard reply: the accidents occurring are to be attributed to insufficient training, to recklessness or to bad equipment. As a consequence, individuals tend to be careless. For example, they are generally reluctant to wear seatbelts in cars even when they admit that they are useful in case of an accident (Robertson, 1974), and they tend to insure too little (low-dollar amounts) (Robertson, 1977). Those in hazardous occupations systematically act as if their work was not risky and tend not to voluntarily use the safety equipment available (Akerlof and Dickens, 1982). People are under 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 applies to 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).

3. *Natural disasters*. There is convincing empirical evidence (Kunreuther, 1976; Kunreuther, Ginsberg, Miller, et al., 1978) that even if extremely attractive flood and earthquake insurance is available (the federal government subsidizes it up to 90%), the large majority does not make use of it (not even those who do *not* speculate on the help by government in the case of a disaster). The fundamental bias discussed thus induces behavior that an outside observer would have to evaluate to be contrary to subjective utility maximization.

4. *Divorce*. Today more than ever marriage is entered into almost unprepared. Few make an appropriate marriage contract or early preparations for a possible divorce (because such acts are interpreted as evidence of lack of love). When somebody experiences a divorce he or she often remarries, with the result that “divorced persons remarrying are likely to divorce again.” No learning effect takes place but rather the contrary. Whereas first marriage rates have shown a steady decline, divorce rates and remarriage rates have climbed (Bianchi and Spain, 1986, pp. 38–39).

5. *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. 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 stipulates a marriage contract because individuals tend to refrain from making one themselves.

According to the view proposed here, Becker’s (1976, p. 167) statement “Even irrational decision units must accept reality and could not, for example, maintain a choice that was no longer within their opportunity set” turns out to be only partly true. The second part of the sentence is obviously true (almost by definition), whereas 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.

#### B. Overextension 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 come forth. Similar to Leibenstein (1976, 1978) or Hirschman (1958), but contrary to orthodox neoclassics, work intensity is not given but can be influenced by appropriate personal strategies. An example of such behavior has already been given by the scholars who regularly overestimate their work capacity. Although 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.

#### IV. TOWARD A LARGER PERSPECTIVE

It is high time that economic theory accepts that human beings are not perfectly functioning automatons who maximize utility as seen and predicted by an outside observer. Humans are weak and fallible. This does not mean that they act irrationally; rather they take into account that they are not perfect and grope for ways to mitigate the damaging effects that may result from their weakness and fallibility.

In this article an attempt has been made to explicitly model one important aspect of the imperfections of human beings. Traditional neoclassical microtheory has been extended by differentiating two possibility sets for human action. In addition to the objective possibility set (the only one included in neoclassics<sup>1</sup>) there is quite another set of possibilities that the individual considers relevant for his or her person only. This set has been called “ipsative” in order to emphasize that it is relevant only for a particular person for his or her own point of view. The two possibility sets differ in four major respects:

1. The objective possibility set is *marginal*. Small changes can meaningfully be evaluated in terms of benefits and costs. The ipsative possibility set is nonmarginal or *absolute*. Alternatives are either considered in full or not at all.



2. OPS is *symmetric*. An increase or decrease in relative prices have in principle the same effect (with a negative sign). IPS is *asymmetric*. Alternatives that are outside the ipsative set are beyond consideration irrespective of how relative prices change. Once alternatives are 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 himself/herself. IPS is *personal*. The environment is looked at from a point of view only relevant for the particular individual. Consequently a (benevolent) outside observer would often suggest different actions from the ones undertaken by the individual concerned.

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

The ipsative theory of human behavior strongly relies on psychological evidence. Similar to writers such as Herbert Simon, Harvey Leibenstein, or Tibor Scitovsky, an effort has been made toward an integration of economics and psychology. Unlike some of these writers (in particular Leibenstein) behavioral anomalies are analyzed here within the context of utility maximization. The "perverse" (non-neoclassical results in spirit) have been reached by more carefully constructing an individual's set of possibilities.

It has become clear that the explanations offered do not in a strict sense contradict orthodox economic theory. Standard neoclassics is flexible enough to describe "all observed human behaviour as optimal, provided it is modeled in the appropriate manner" (Schoemaker, 1982, p. 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 of them is more parsimonious, conforms better to common sense, and can more easily be reconciled with empirical observations (without having to add auxiliary assumptions).

The ipsative model developed here is only a first step; many aspects are only tentative and have to be explored further. In particular, the conditions under which individuals do not undertake all that is objectively possible (the ipsative is a subset of the objective possibility set), and under which the ipsative set is extended beyond the objective set have to be more fully analyzed. For the case of an under- or overextension by design these conditions have (at least partly) been identified here, but the conditions for an under- or overextension due to human nature have yet to be explored. Are they solely dependent on personality traits, or are they also context dependent? This author tends to believe that it is possible to identify structural conditions in which human beings systematically underextend, and other structural conditions in which they systematically overextend, their ipsative set. Once these structural conditions are known it will be possible to empirically test the ipsative model by direct observation.

## ACKNOWLEDGMENTS

The basic ideas pertaining to the ipsative theory of behavior discussed here have been developed jointly with Klaus Foppa, professor of psychology at the University of Bern. Other aspects than those dealt with here are presented in Frey and Foppa (1986) and Foppa (1987). This author is solely responsible for this particular article. Preliminary versions have been presented at the Internal Seminar of the chair for economic policy at the University of Zurich, at the Rencontre de Kirchberg (February 1988), and at the Bellagio Conference on "Efficiency, Internal Organization and Comparative Management: A Critical Appraisal of the X-Efficiency Paradigm" (May 1988). I am grateful for helpful suggestions received at these occasions, and in particular to the specific comments made by Oded Stark and Reiner Eichenberger.

## NOTE

1. Within neoclassics, a subjective possibility set may also exist. It refers to what an individual subjectively perceives to be the objective possibility set. Due to accumulating information and competition processes this subjective set tends to merge into the objective set. The subjective possibility set differs fundamentally from the ipsative possibility set.

## REFERENCES

- Adler, Stanley. "Risk Making Management." *Business Horizons* 23 (1980): 11-14.
- Allais, Maurice. "Le Comportement de L'Homme Rationnel Devant Le Risque: Critique des Postulats et Axiomes de L'Ecole Américaine." *Econometrica* 21 (October 1953): 503-546.
- Ainslie, George. "Specious Reward: A Behavioral Theory of Impulsiveness and Control." *Psychological Bulletin* 82 (July 1975): 463-496.
- Akerlof, George A., and William T. Dickens. "The Economic Consequences of Cognitive Dissonance." *American Economic Review* 72 (June 1982): 302-319.
- Alderfer, Clayton P., and Harold Bierman. "Choices with Risk: Beyond the Mean and Variance." *Journal of Business* 43 (1970): 341-353.
- American Cancer Society. *A Study of Motivational and Environmental Deterrents to the Taking of Physical Examinations that Include Cancer Tests*. New York, 1966.
- Becker, Gary S. "Irrational Behavior and Economic Theory." *Journal of Political Economy* 70 (February 1962): 1-13.
- Becker, Gary S. *The Economic Approach to Human Behavior*. Chicago: Chicago University Press, 1976.
- Bianchi, Suzanne M., and Daphne Spain. *American Women in Transition*. New York: Sage, 1986.
- Brehmer, B. "In One Word: Not from Experience." *Acta Psychologica* 45 (1980): 223-241.
- de Finetti, Bruno. "Probability: Interpretations." Pp. 496-504 in *International Encyclopedia of the Social Sciences* (Vol. 12), edited by D.E. Sills. New York: Macmillan, 1968.
- Einhorn, Hillel J. "Learning from Experience and Suboptimal Rules in Decision Making." Pp. 1-20 in *Cognitive Processes in Choice and Decision Behavior*, edited by Thomas S. Wallsten. Hillsdale, NJ: Erlbaum, 1980.
- . "Learning from Experience and Suboptimal Rules in Decision Making." Pp. 268-283 in *Judgement Under Uncertainty: Heuristics and Biases*, edited by P. Kahneman, P. Slovic, and A. Tversky. Cambridge: Cambridge University Press, 1982.
- Einhorn, Hillel J., and Robin M. Hogarth. "Confidence in Judgement: Persistence of the Illusion of Validity." *Psychological Review* 85 (1978): 395-416.
- . "Behavioral Decision Theory: Processes of Judgement and Choice." *Annual Review of*

- Psychology* 32(1981): 53-88.
- Ellsberg, Daniel. "Risk, Ambiguity and the Savage Axioms." *Quarterly Journal of Economics* 75 (November 1961): 643-669.
- Elster, Jon. "Ulysses and the Sirens: A Theory of Imperfect Rationality." *Social Science Information* 16 (1977): 469-526.
- Elster, Jon. "Sour Grapes—Utilitarianism and the Genesis of Wants." Pp. 219-238 in *Utilitarianism and Beyond*, edited by Amartya K. Sen and Bernard Williams. Cambridge: Cambridge University Press, 1982.
- Elster, Jon (Ed.). *The Multiple Self*. Cambridge: Cambridge University Press, 1986.
- Fischhoff, Baruch, Sarah Lichtenstein, Paul Slovic, Stephen L. Derby, and Ralph L. Keeney. *Acceptable Risk*. Cambridge: Cambridge University Press, 1981.
- Foppa, Klaus. "Individual Resources, Objective Constraints, and the Ipsative Theory of Behavior." (Mimeo.) Psychological Institute of the University of Bern, December 1987.
- Frankfurt, Harry G. "Freedom of the Will and the Concept of a Person." *Journal of Philosophy* 68 (January 1971): 5-20.
- Frey, Bruno S. "The Economic Model of Behaviour: Shortcomings and Fruitful Developments." *Discussion Paper*, Institute for Empirical Economic Research, University of Zurich, June 1983.
- Frey, Bruno S., and Klaus Foppa. "Human Behavior: Possibilities Explain Action." *Journal of Economic Psychology* 7 (1986): 137-160.
- Goudriaan, René, and Gerrit Jan van t'Eind. "To Fee or Not to Fee: Some Effects of Introducing Admission Fees in Four Museums in Rotterdam." Pp. 103-109 in *Managerial Economics of the Arts*, edited by V.L. Owen and W.S. Hendon. Akron, Ohio: Association for Cultural Economics, 1985.
- Grether, David M., and Charles R. Plott. "Economic Theory of Choice and the Preference Reversal Phenomenon." *American Economic Review* 69 (September 1979): 623-638.
- Hirschman, Albert O. *The Strategy of Economic Development*. New Haven: Yale University Press, 1958.
- \_\_\_\_\_. *Shifting Involvements: Private Interests and Public Action*. Oxford: Martin Robertson, 1982.
- Hogarth, Robin M. "Cognitive Processes and the Assessment of Subjective Probability Distributions." *Journal of the American Statistical Association* 70 (June 1975): 271-294.
- Kahneman, Daniel, Paul Slovic, and Amos Tversky (Eds.). *Judgement Under Uncertainty: Heuristics and Biases*. Cambridge: Cambridge University Press, 1982.
- Kahneman, Daniel, and Amos Tversky. "Prospect Theory: An Analysis of Decision Under Risk." *Econometrica* 47 (March 1979): 263-291.
- Keyes, Ralph. *Changing It*. Boston: Little, Brown, 1985.
- Kirscht, J.P., D.P. Haefner, S.S. Kagelas, and I.M. Rosenstock. "A National Study of Health Beliefs." *Journal of Health and Human Behavior* 7 (1966): 248-254.
- Kunreuther, Howard. "Limited Knowledge and Insurance Protection." *Public Policy* 24 (1976): 227-261.
- Kunreuther, Howard, Ralph Ginsberg, Louis Miller, et al. *Disaster Insurance Protection: Public Policy Lessons*. New York: Wiley, 1978.
- Kunreuther, Howard, and Paul Slovic. "Economic Psychology and Protective Behaviour." *American Economic Review, Papers and Proceedings* 68 (May 1978): 64-69.
- Langer, Ellen J. "The Illusion of Control." Pp. 231-238 in *Judgement Under Uncertainty: Heuristics and Biases*, edited by D. Kahneman, P. Slovic, and A. Tversky. Cambridge: Cambridge University Press, 1982.
- Leibenstein, Harvey. *Beyond Economic Man*. Cambridge, MA: Cambridge University Press, 1976.
- \_\_\_\_\_. "On the Basic Proposition of X-Efficiency Theory." *American Economic Review* 68 (May 1978): 328-332.
- \_\_\_\_\_. "On the Economics of Conventions and Institutions: An Exploratory Essay." *Journal of Institutional and Theoretical Economics* 140 (May 1984): 74-89.
- \_\_\_\_\_. "On Relaxing the Maximization Postulate." *Journal of Behavioral Economics* (Winter 1985): 5-20.
- \_\_\_\_\_. "Entrepreneurship, Entrepreneurial Training and X-Efficiency Theory." *Journal of Economic Behaviour and Organization* 8, 2 (1987): 191-205.
- Machina, Mark J. "Choice Under Uncertainty: Problems Solved and Unsolved." *Journal of Economic Perspectives* 1, 1 (1987): 121-154.
- Maital, Shlomo. "Prometheus Rebound: On Welfare-Improving Constraints." *Eastern Economic Journal* 12 (July-September 1986): 337-343.
- March, James G., and Zur Shapira. "Managerial Perspectives on Risk and Risk Taking." *Management Science* 33 (November 1987): 1404-1418.
- March, James G., and Herbert A. Simon. *Organizations*. New York: Wiley, 1958.
- Margolis, Howard. *Selfishness, Altruism and Rationality. A Theory of Social Choice*. Cambridge: Cambridge University Press, 1982.
- Newell, A., and Herbert A. Simon. *Human Problem Solving*. Englewood Cliffs, NJ: Prentice-Hall, 1972.
- Nisbett, Richard E., Eugene Borgida, Rick Crandall, and Harvey Reed. "Popular Induction: Information Is Not Necessarily Informative." Pp. 101-116 in *Judgement Under Uncertainty: Heuristics and Biases*, edited by D. Kahneman, P. Slovic, and A. Tversky. Cambridge: Cambridge University Press.
- Payne, John W. "Contingent Decision Behavior." *Psychological Bulletin* 92, 2 (1982): 382-402.
- Rethans, A. *An Investigation of Consumer Perceptions of Product Hazards*. Ph.D. dissertation, University of Oregon, 1979.
- Robertson, L.S. *Urban Area Safety Belt Use in Automobiles*. Washington, DC: Insurance Institute for Highway Safety, 1974.
- \_\_\_\_\_. "Car Crashes: Perceived Vulnerability and Willingness to Pay for Crash Protection." *Journal of Community Health* 3 (1977): 136-141.
- Savage, Leonard J. *The Foundations of Statistics*. New York: Wiley, 1954.
- Schelling, Thomas C. "Egonomics, or the Art of Self-Management." *American Economic Review, Papers and Proceedings* 68 (May 1978): 290-294.
- \_\_\_\_\_. "The Intimate Contest for Self-Command." *Public Interest* 60 (Summer 1980): 94-118.
- Schmoelders, Guenther. *Verhaltensforschung im Wirtschaftsleben. Theorie und Wirklichkeit*. Hamburg: Rowohlt, 1978.
- Schoemaker, Paul J. *Experiments in Decisions Under Risk: The Expected Utility Hypothesis*. Boston, MA: Nijhoff, 1980.
- \_\_\_\_\_. "The Expected Utility Model: Its Variants, Purposes, Evidence and Limitations." *Journal of Economic Literature* 20 (June 1982): 529-563.
- Sen, Amartya K. "Choice, Orderings and Morality." Pp. 54-67 in *Practical Reason*, edited by S. Koerner. Oxford: Oxford University Press, 1974.
- Sen, Amartya K. "Rational Fools: A Critique of the Behavioural Foundations of Economic Theory." Pp. 84-107 in *Philosophy and Economic Theory*, edited by F. Hahn and M. Hollis. Oxford: Oxford University Press, 1979.
- Shapira, Zur. *Risk in Managerial Decision Making*. Unpublished manuscript. Hebrew University, 1986.
- Simon, Herbert A. "A Behavioral Model of Rational Choice." *Quarterly Journal of Economics* 69

- (1955): 99-118.
- Slovic, Paul, Baruch Fischhoff, and Sarah Lichtenstein. "Behavioral Decision Theory." *Annual Review of Psychology* 28 (1977): 1-39.
- Stigler, George, and Gary S. Becker. "De Gustibus Non Est Disputandum." *American Economic Review* 67 (March 1977): 76-90.
- Strickland, Lloyd, Roy W. Lewicki, and Arnold M. Katz. "Temporal Orientation and Perceived Control as Determinants of Risk Taking." *Journal of Experimental Social Psychology* 2 (1966): 143-151.
- Strotz, Robert H. "Myopia and Inconsistency in Dynamic Utility Maximization." *Review of Economic Studies* 23 (1955-1956): 165-180.
- Svenson, O. "Risks of Road Transportation to a Psychological Perspective." *Accident Analysis and Prevention* 10 (1978): 267-280.
- Thaler, Richard H. "Toward a Positive Theory of Consumer Choice." *Journal of Economic Behavior and Organization* 1 (March 1980): 39-60.
- . "Mental Accounting and Consumer Choice." *Marketing Science* 4 (Summer 1985): 199-214.
- Thaler, Richard H., and H.M. Shefrin. "An Economic Theory of Self-Control." *Journal of Political Economy* 89 (April 1981): 392-406.
- Tversky, Amos, and Daniel Kahneman. "Availability: A Heuristic for Judging Frequency and Probability." *Cognitive Psychology* 5 (1973): 207-232.
- Tversky, Amos, and Daniel Kahneman. "The Framing of Decisions and the Psychology of Choice." *Science* 211 (1981): 453-458.
- van Raaij, Fred W. "Attribution of Causality to Economic Actions and Events." *Kyklos* 38 (1985): 3-19.
- von Neumann, John, and Oskar Morgenstern. *Theory of Games and Economic Behavior* (2d ed.). Princeton, NJ: Princeton University Press, 1947.
- Weck-Hannemann, Hannelore, Werner W. Pommerehne, and Bruno S. Frey. *Schattenwirtschaft*. Munich: Vahlen, 1984.
- Weinstein, Neil D. "Seeking Reassuring or Threatening Information about Environmental Cancer." *Journal of Behavioral Medicine* 16 (1979): 220-224.
- . "Unrealistic Optimism about Future Life Events." *Journal of Personality and Social Psychology* 39 (1980): 806-820.
- Winston, Gordon C. "Addiction and Backsliding: A Theory of Compulsive Consumption." *Journal of Economic Behavior and Organization* 1 (1980): 295-324.