



# Alternatives, Frames, and Relative Prices: A Broader View of Rational Choice Theory

Siegwart Lindenberg<sup>1</sup> and Bruno S. Frey<sup>2</sup>

<sup>1</sup>*Department of Sociology, University of Groningen*

<sup>2</sup>*Department of Economics, University of Zürich*

One important consequence of the increasing convergence between sociology and economics is that sociologists make increasingly more use of rational choice theories for the explanation of social action. This shift opens up the possibility that sociologists make use of what must be considered to be the most powerful regularity in the social sciences: the relative price effect, which states that behavior depends directly on relative prices (or relative scarcities). This effect is also known as the law of demand: as one good becomes more costly in comparison to others, a person will purchase less of that good. It turns out that crucial sociological questions (for instance the relation of gain-oriented behavior to moral behavior) make it necessary that we know something about the size of the relative price effect. Surprisingly, there is virtually no theory in economics on this point and thus rational choice theory is badly in need of being extended in this direction. In this paper, two such extensions are suggested. First, a theory of alternatives consisting of (a) a theory of social production functions, (b) a theory of non-given alternatives and (c) a theory of 'ipsative' sets of alternatives. Second, a theory of framing is presented which links the relative price effect to the definition of the situation which in turn is theoretically linked to the theory of alternatives. It is argued that these extensions make rational choice theory much more relevant for sociological applications than the neo-classical model in which alternatives are exogenously given and the definition of the situation is implicitly locked to a standard trading situation.

*Siegwart Lindenberg, ICS/Department of Sociology, University of Groningen, Grote Rozenstraat 31, 9712 TG Groningen, The Netherlands*

## 1. The importance of looking at relative prices

Sociologists are, almost by definition of the field, interested in phenomena on the collective level. In the last fifteen to twenty years, however, it became increasingly clear that interest in social phenomena, involving interaction, rules, rates, etc., should not dictate the level of basic theory one uses to explain them. The reason seemed simple and compelling: all social phenomena are the product of human action and therefore the basic theory used to explain social phenomena should be one of human action. The use of neo-classical

price theory for this purpose seemed a strange choice at first, because sociologists had for so long maintained that price theory could only be applied to the market. Yet work like Downs' (1957) analysis of political parties, Olson's (1965) model of collective action, Buchanan & Tullock's (1962) approach to institutional design, and Becker's treatise on the family (1981) showed that price theory could also be applied to virtually every collective phenomenon outside the market place.<sup>2</sup> The label used to identify work in sociology that made use of price theory in one form or the other is 'rational choice'. Both words contrast with learning theory in which there is little rationality and no choice assumed. Learning theory, in turn, had been the

### 3. Economics and alternatives

If we are interested in the size of the relative price effect, we first have to answer the seemingly trivial question: the relative prices of what goods? There are so many goods that it is by no means trivial to know what prices are relevant. The question about the size of the relative price effect is thus tied to a theory of alternatives.

In standard consumer theory a distinction is made between preferences and constraints. Preferences order bundles of certain goods (the virtual set of alternatives) and constraints define the set of these bundles from which a person can choose (the feasible set of alternatives). Standard assumption is that preferences are constant so that change in choice behavior is explained by change in constraints. Constraints, in turn, consist of resources and prices. The standard resources in neo-classical economics are money and time.

It is quite standard in economics to assume a utility function in which every good is represented:  $U = U(x_1, x_2, \dots, x_n)$ . The background assumption is that the consumer has perfect information on the existence, nature and quality of all goods and their prevailing prices. The virtual set of alternatives consists of all possible combinations of quantities of these goods. Prices and income constraints determine together which alternatives in the virtual set are feasible. The individual has ordered preferences over the alternatives in the virtual set and chooses the best alternative of the feasible set.

Thus, in principle, the consumer keeps track of all goods and their prevailing prices, and all combinations of goods are meaningful. In any particular analysis, the researcher cannot work with all these alternatives. In fact he or she has to make a selection on the basis of practical or *ad hoc* considerations. If one is interested in the consumption of, say, motor boats, one would only look at some utility arguments, probably close substitutes and possibly time.

In the social sciences, applications of microeconomic analyses often involve only *one* explicit utility argument and thus the alternatives are different quantities of one

good. This kind of analysis is based on a particular form of the relative price effect: the individual chooses the quantity for which marginal costs and benefits (say, both measured in dollars) are identical. For the sake of convenience it is often assumed that the marginal cost curve (analogous to the supply curve) slopes upward and the marginal benefit curve (analogous to the demand curve) slopes downward with increasing quantity. For example, let the good in question be 'number of crimes committed'. The analysis consists of relating social events to changes in the position of the curves. Thus, if judges become more lenient, this lowers the marginal costs of committing a crime and the supply curve will move down and to the right, which pushes the intersection with the demand curve to the right: the predicted number of crimes committed increases. McKenzie & Tullock (1985:119) provide such an analysis and they compare it favorably to the work of sociologists who are said to maintain that punishment does not deter crime.<sup>8</sup>

It is obvious that this kind of analysis does not take us very far. It brings us right back to the old dichotomy: do relative prices have an effect, yes or no? Economic analysis would have to show that the answer is 'yes'. And since there is no guidance for the selection of utility arguments, it seems perfectly legitimate to assume in the abstract that the individual keeps track of all prevailing prices while the researcher deals concretely only with one (ordinal) price change and one sort of alternatives.

The important question should be (but isn't): *how large* is the relative price effect of a certain event and is it offset by other relative price effects not included in the analysis? For example, if the punishment meted out by judges becomes harsher for robbery, the cost of committing a robbery will increase and, due to the relative price effect, the number of crimes committed should decrease. So far so good for the standard assumption and a clear policy recommendation. But things don't seem to be that straightforward (see Blumstein et al. 1978). We do not know what part of the cost of committing a crime comes from anticipated punishment and what part from other sources, such as the loss of social

approval when caught, power difference with the victim (say, whether people move about alone or in groups), observability (say, the presence of street lights), whether potential victims carry a purse, etc. (see Gottfredson & Hirschi 1990:28 ff.). The size of the relative price effect of harsher punishments may vary widely owing to differences in these other sources of costs. Without knowing anything about the size of the effect, it will be very difficult to counterbalance harsher punishment with other of its possible price effects. What are the individual's alternatives to committing a robbery?<sup>9</sup> Some might shift to other kinds of gainful crime which are more difficult to detect<sup>10</sup> or in which it is difficult to be identified. Others might commit even larger robberies because punishment for these crimes now becomes relatively more lenient.<sup>11</sup> In the process, they will now have a higher incentive to silence their victims. In addition, those who have had the harsher punishment might be more likely to commit a big and risky robbery again.<sup>12</sup> What would be the *net* result of a harsher punishment for robbery? Which increase in harshness would have what kind of effect on robberies committed?<sup>13</sup>

Understandably, since the analysis with an *ad hoc* selection of alternatives does not lend itself to answering these kinds of questions, McKenzie and Tullock would be satisfied to find that with 'crime rate' being the dependent variable, the regression coefficient of some indicator of severeness of punishment is negative (see McKenzie & Tullock 1985:138). As Friedman (1971) has aptly observed, economists are quick to accept empirical evidence as long as it shows the semblance of a relative price effect.

#### 4. Toward a theory of alternatives

There is no theory of alternatives. However, there are a number of interesting, separate developments that bear on the question: Where do alternatives come from? In the recent literature, we find three answers to this question: first, they come from hierarchical instrumental connections; second, they come from active pro-

duction; and third, they come from biases. Let us take these up in order.

##### 4.1. Instrumental goals

The distinction between goals and means is vital to the very heart of rational choice. The implicit theory of alternatives of microeconomics equates preferences with goals and constraints with means. This leaves goals outside the theory. Yet, Becker has thought of an ingenious way of getting them at least partially endogenized without bringing in a psychology of taste.

The theory of instrumental goals rests on the assumption of two kinds of preferences (see Stigler & Becker 1977): *universal* preferences (goals) that are identical to all human beings and therefore need no explanation, and *instrumental* preferences for the means that lead to the ultimate goals which are in fact constraints and can thus be explained in a constant-driven approach. Technically speaking, there is only one utility function for all mankind but there are systematically different production functions for different kinds of people.<sup>14</sup> Buying a particular good is now not an act of consumption but the purchase of a means of production, such as a record for the production of music pleasure.

Yet, Becker's solution had one drawback: the universal preferences are not specified. This opens again the door to *ad hoc* theorizing. If one cannot explain a preference as instrumental, one can simply call it universal. For this reason, Becker's approach did not bring about the hoped for grasp on alternatives. In recent years, Becker's approach was further developed into what may be called the 'theory of social production functions' (see Lindenberg 1986, 1991).

First of all, two general goals are identified. The first is the major goal assumed in economics: physical well-being. It is this goal that drives the acquisition of most consumer goods. By a silent assumption that effort brings about a reduction in physical well-being, economists introduce effort as costs, an important assumption, not just for labor market theory. There are good reasons to assume that this identification of effort as costs is too restrictive. Human beings seem to prefer a certain level of

situation in the social setting, including their resourceful behavior.<sup>18</sup>

*Fundamental uncertainty.* Imagine it is going badly with your company and you need to find a solution. Then, if you know what to look for, you can start your search. But if you don't know what to look for in order to solve your problem, what will you do? In this respect, you find yourself in a situation of 'fundamental uncertainty' where probabilities of outcomes are of no help (see Knight 1921). This corresponds to the situation of an entrepreneur who endeavors to make an innovation in order to survive but who does not know at all in which direction to look for this unknown invention.

This kind of problem of non-given alternatives in fundamental uncertainty gets us right to a frontier of theory development that is wide open to suggestions from other disciplines, including psychology and philosophy. Relative price signals play no or only a very small role here because neither are characteristics, nor prices nor distributions known. Without a theory of entrepreneurs it is difficult to explain economic growth, but without solving this aspect of non-given alternatives, it is difficult to come up with a theory of entrepreneurs. This problem has been central to the so-called 'Austrian' economists (see Kirzner 1985) and it drives evolutionary economics (see Witt 1987). At the open end towards psychology and philosophy, we find interesting work on custom (Schlicht 1993) and on communication (Siegenthaler 1989).<sup>19</sup> In short, the work on non-given alternatives stretches all the way from search processes and network effects to the creative process of open discourse. But in all cases, the individual is engaged in the production of alternatives, which suggests that we should include this aspect in the reconstruction of social production functions. Future developments will certainly find rich opportunities in this field of enquiry.

*Self-command.* The described developments on non-given alternatives arose from the introduction of imperfect information into the neo-classical model. Another, related effort to deal with non-given alternatives has come from the introduction

of the weakness of the will into that model. There is a short-term and a longer-term rationality. An individual may not trust himself to follow the longer-term rationality in his choice and may thus *reduce* his alternatives so that the longer-term rationality will prevail. There is a problem of self-command. This is the story of burning your bridges behind you, or of requesting a ten-month salary to be paid out in twelve months, or of taking little cash and no credit card along when you go out, so you won't spend much money. This aspect of non-given alternatives is more than just a curiosity.<sup>20</sup> Individuals may fail to reduce their alternatives in which case the relative price changes relating to short-term goals will overshadow those relating to longer term goals. For example, an employee may postpone making an important phonecall about a late shipment because he is embarrassed to admit a mistake. The damage to the firm that follows from this postponement (which may even cost him the job) may not at *this point in time* make him pick up the phone and call. Clearly, the governance structures of organizations have to accommodate these kinds of self-command effects (see Lindenberg 1993a). Theoretical solutions to these problems of procrastination, impatience and addiction within a rational choice framework are still in flux, but one possibly could be the theory of framing, presented in section 5 below.

#### 4.3. Ipsative constraints

So far, limited information and self-command problems have set up the individual to interfere actively in the production of alternatives. There is yet another factor that affects alternatives, but the process is almost the opposite: the individual influences alternatives but not as an active production which is itself subject to the relative price effect. Consider the individual who believes that probabilities only hold for others while he is immune to risk. Such an individual has seemingly alternatives others do not have (say, he can cross the street without looking and still not be killed by traffic no matter how often he does it), and at the same time, he is quite immune from registering changes in relative prices in these alternatives, because such changes

would be mainly relevant for other. Such an individual has 'made' the extra alternatives but he has not produced them in the sense described above. Frey (1988) has called this the ipsative possibility set (from the Latin 'ipse', self). Learning plays a very limited role: it is only important for the feasible set assumed for representative others, not for the ipsative set. The ipsative set of alternatives is maintained over long periods of time (see Frey 1988). As Ellickson (1991:157) observed in his study of cattle trespassing conflicts, 'in some contexts a person's perceptions seem to be distorted not by lack of cognitive capacity but rather by cracks in his lens'. Take the most frequent case in which the ipsative set is larger than the representative (fairly 'objective') one. If the 'wrong' extension of the set were typical for unintelligent persons only, or the result of an error due to lack of information, it would disappear quickly and the incompatibility between the ipsative and the representative sets would not be of much relevance. However, such an overextension happens in many situations for perfectly normal, rational individuals. Managers or scholars, who regularly overload their business agenda may serve as a common example.

The lack of learning is due to systematic biases that enter the definition of the situation (i.e. the construction of reality). Individuals tend to underestimate the possibility of negative events and to overestimate the possibility of positive events for themselves. They also have a 'judgemental bias: they (have a) predilection to view themselves as personally immune to hazards' (Fischhoff et al. 1981:29 f.), and they 'tend to think they are invulnerable. They expect others to be the victim of misfortune, not themselves' (Kirscht et al. 1966). Weinstein (1980:810) presented empirical evidence based on a survey, showing that the overextension of the ipsative set is a common feature in many areas. Most of the events he lists refer to diseases or accidents where people have a strong tendency to exclude themselves from the base they assumed for the representative others. They put themselves in another category.<sup>21</sup> As a consequence, the relative price effect may be muffled due to lack of learning. For the

study of transmissible diseases, such as aids, these suspensions of the relative price effect are particularly relevant.

## 5. Framing

Neo-classical price theory assumed that alternatives are given. This implies that choice situations are given, and therefore there was also never any attempt to study the process by which a choice situation is structured. However, this structuring process itself may exert a considerable influence on the size of the relative price effect because selective attention may govern it.

Sociologists have always insisted that social analysis acknowledges the fact that people define their action situation and that this definition thoroughly influences what they will be doing. In fact, this is the core idea behind 'the social construction of reality'. But because sociologists have traditionally not worked with choice theory, this insight had never been incorporated into a choice context. With a little reflection, it becomes obvious that if this 'definition of the situation' idea is right, then there would be large differences in the size of the relative price effect, depending on whether a good is inside or outside the definition of the situation or 'framing' as it came to be called.

Recent developments allow us to trace these consequences in some more detail. Kahneman & Tversky (1979) have shown that framing a situation as a gain or a loss situation makes a large difference to relative price effects.

Lindenberg has elaborated a framing theory in the early 1980s, called the discrimination model, that went one step further. He showed how goods (aspects) that are outside the frame can still influence behavior, although in a much weaker way than aspects that are inside the frame. For reasons of space, it is only possible to present the bare outline of this model here (for a recent formulation, see Lindenberg 1993b).

The basic idea is that people have various potential goals in any action situation and that one goal wins out to structure (i.e. to 'frame') the situation, by providing the criteria for selecting and ordering the

be supposed to decide to go or not to go to a protest march on abortion. He weighs the alternatives by evaluating the outcomes for going and not going and chooses the option with the highest net utility. There is no easy way in which the fact that the law has changed the day before, allowing a referendum even on abortion, would find its way into the analysis. Possibly, the imputed evaluation of outcomes is also not differentiated according to the various opportunity costs of different actors, etc. In short, by using SEU theory, the rational choice sociologist may unnecessarily neglect much of the potential of the relative price effect in his or her analysis. Close attention to social production functions and non-given alternatives should alert the researcher to relative price effects even when using SEU.

Received April 1993

Final version accepted June 1993

## Notes

<sup>1</sup> We are grateful for helpful remarks by Jacques Siegers and James Coleman. Support from the NWO (Netherlands Organization for Scientific Research) for an extended stay of Bruno Frey at the ICS in The Netherlands and travel funds from the Richard Büchner-Stiftung are gratefully acknowledged.

<sup>2</sup> See Albert (1977) for a description of the 'economic' research program and see Frey (1992a) for additional examples of the applications of this program outside the market.

<sup>3</sup> At least among economists there is considerable consensus on this point. McKenzie and Tullock (1985) speak of 'the strongest predictive statement a social scientist can make with regard to human behavior' (p. 17). Of course, there are limitations to this effect, and we will discuss some of them later on.

<sup>4</sup> This does not mean that learning effects are ruled out. All it means is that learning effects should be introduced in order to conditionalize relative price effects, rather than the other way around (see Lindenberg 1989).

<sup>5</sup> Psychologists have criticized the assumption of price theory that individuals have preferences over all alternatives, whereas in fact individuals often do not know what they want (see for example Muchinsky 1977). Yet, their interest focuses mainly on finding out why people are confused (see, for example, Fischhoff et al. 1980) and on devising methods for helping people get to know what they want (see, for example, Beach

& Beach 1982) rather than on conditionalizing the relative price effect.

<sup>6</sup> Etzioni's work (1988) and the recent work of Elster (1989) are typical of this stance.

<sup>7</sup> Etzioni downrightly discourages such rethinking by claiming that if one does that it just shows that one is busy with 'within-the-fold adaptations' (see Etzioni 1988: 38 f.).

<sup>8</sup> They go even so far as to blame the sociologists' reserve concerning the effect of punishment for the recent increases in crime (*ibid.*, p. 135).

<sup>9</sup> As we will discuss later on there is no heuristics in standard micro-economics for answering this question. Yet, for relative price effects, it would make a big difference what goals we are able to identify for burglary.

<sup>10</sup> Notice that this would contribute to a spurious relative price effect of punishment.

<sup>11</sup> 'Now I know if I's gonna rob somethin' it ought to be big, because I'm gonna get the same time.' McKenzie & Tullock (1985:132) quote this statement of a young criminal without drawing any conclusion from it.

<sup>12</sup> 'A person who may be depressed and care very little about living can hardly be expected to divert many resources to avoid being killed' say McKenzie & Tullock (1985:129), but they do not apply this insight to their own analysis of the side effects of punishment.

<sup>13</sup> Even more sophisticated economic analyses of crime (such as Ehrlich 1973 and Becker 1976: ch. 4) generally do not ask these questions.

<sup>14</sup> And again, for people with identical production functions, relative prices may differ.

<sup>15</sup> This analysis is worked out in more detail in Lindenberg (1991).

<sup>16</sup> See the studies of Flap & De Graaf (1986); De Graaf & Flap (1988); Lindenberg (1988); Flap & Tazelaar (1989); Weesie & Flap (1991); Broese van Groenou et al. (1990); Boxman et al. (1991); Sprengers (1992); Burt (1992).

<sup>17</sup> See on this point also White (1993). White's theory of markets assigns a much larger role to non-given alternatives than conventional theories.

<sup>18</sup> For example, the gut reaction of managers when faced with a risky decision situation is to make every effort to reduce the risk, i.e. to make the alternative to be chosen as secure as possible. For this purpose they muster a multitude of means, for example collecting additional information, insurance, but above all changing the project at hand (see e.g. March & Shapira 1987:1404; MacCrimmon & Wehrung 1985, 1986).

<sup>19</sup> Habermas's (1981) discourse process may also be relevant here, although it would need closer analysis in terms of non-given alternatives (see Osterloh 1993).

<sup>20</sup> There is much research on this topic lately. See Elster (1979), Schelling (1980) and Buchanan (1990) for some general discussions. To this category also belong problems of intertemporal choice in economics (see Akerlof 1991).

<sup>21</sup> An empirically important case of over-optimism relates to the entry into professions (for further evidence see Frey & Heggli 1989).

<sup>22</sup> This can also be seen as a sunk cost effect. In economics, sunk cost should play no role although all experimental evidence on this point indicates that sunk costs do play a role. There is no room here to elaborate why the sheer sunk cost effect leads to predictions that are worse than the prediction of the discrimination model (see Braspenning (1992) for a detailed discussion of this point).

<sup>23</sup> See Frey (1992b and 1993) and the literature cited on this point in these two articles.

<sup>24</sup> Recently, the discrimination model has been tested extensively, also in comparison to Kahneman and Tversky's prospect theory. The experimental evidence strongly corroborates the discrimination model and suggest that some elements of the prospect theory (like the asymmetric utility function for losses and gains) work better when integrated into the discrimination model (see Braspenning 1992).

<sup>25</sup> As we have seen above, within sociology there is renewed interest in these stabilizing habits but it is seen as an alternative to purposeful action rather than part of a theory of purposeful action: 'the neoinstitutionalist rejection of intentionality is founded on an alternative theory of individual action, which stresses the unreflective, routine, taken-for-granted nature of most human behavior and views interests and actors as themselves constituted by institutions' (Powell & DiMaggio 1991:14). Thus, the sociological neoinstitutionalists see themselves confronted with the choice of either dropping the routine aspects or the relative piece aspects and deciding for the latter. Framing theory was designed to make this unfortunate trade-off unnecessary.

## References

- Akerlof, G. A. 1991. Procrastination and Obedience. *American Economic Association Papers and Proceedings*, May, 1-19.
- Albert, H. 1977. Individuelles Handeln und soziale Steuerung: die ökonomische Tradition und ihr Erkenntnisprogramm. In H. Lenk (Hrsg.), *Handlungsprobleme - interdisziplinär*, S. 177-225, Band 4, München.
- Beach, B. & Beach, L. R. 1982. Expectancy-based Decision Schemes: Sidesteps Toward Applications. In N. T. Feather (ed.), *Expectations and Actions. Expectancy-Value Models*

- in *Psychology*, pp. 365-394. Hillsdale, NJ: Lawrence Erlbaum.
- Becker, G. S. 1976. *The Economic Approach to Human Behavior*. Chicago: Chicago University Press.
- Becker, G. S. 1981. *A Treatise on the Family*, Cambridge, MA: Harvard University Press.
- Blumstein, A., Cohen, J. & Nagin, D. 1978. *Deterrence and Incapacitation: Estimating the Effects of Sanctions on the Crime Rate*. Washington, DC: National Academy Press.
- Boxman, E. A. W., de Graaf, P. M. & Flap, H. D. 1991. The Impact of Social and Human Capital on the Income Attainment of Dutch Managers. *Social Networks* 13, 51-73.
- Braspenning, J. 1992. *Framing: de prospecttheorie en het discriminatiemodel*, Groningen.
- Broeve van Groenou, M. I., Flap, H. D. & Tjihuis, M. 1990. Changes in Social Networks After Divorce: An Investment Theory. In J. Weesie & H. D. Flap (eds), *Social Networks Through Time*, pp. 31-44. Utrecht, ISOR-reeks.
- Buchanan, J. 1990. The Domain of Constitutional Economics. *Constitutional Political Economy* 1, 1-18.
- Buchanan, J. & Tullock, G. 1962. *The Calculus of Consent. Logical Foundations of Constitutional Democracy*. Ann Arbor: University of Michigan Press.
- Burt, R. S. 1992. *Structural Holes, The Social Structure of Competition*. Cambridge, MA: Harvard University Press.
- De Graaf, N. D. & Flap, H. D. 1988. With a Little Help from my Friends. Social Resources as an Explanation of Occupational Status and Income in the Netherlands, the United States and West Germany. *Social Forces* 67, 43-72.
- Devine, T. J. & Kiefer, N. (eds) 1991. *Empirical Labor Economics: The Search Approach*. New York/Oxford: Oxford University Press.
- Downs, A. 1957. *An Economic Theory of Democracy*. New York: Harper and Row.
- Ehrlich, I. 1973. Participation in Illegitimate Activities: a Theoretical and Empirical Investigation. *Journal of Political Economy* 81.
- Ellikson, R. C. 1991. *Order, Without Law, How Neighbors Settle Disputes*. Cambridge, MA: Harvard University Press.
- Elster, J. 1979. *Ulysses and the Sirenes*. Cambridge: Cambridge University Press.
- Elster, J. 1989. *The Cement of Society. A Study of Social Order*. Cambridge: Cambridge University Press.
- Etzioni, A. 1988. *The Moral Dimension. Toward a New Economics*. New York: Free Press.
- Fischhoff, B., Slovic, P. & Lichtenstein, S. 1980. Knowing What You Want: Measuring Labile Values. In T. Wallsten (ed.), *Cognitive Pro-*