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Edited by
JAMES S. COLEMAN
THOMAS J. FARARO

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Chapter 1

THE METHOD OF DECREASING ABSTRACTION

SIEGWART LINDENBERG
ICS, the University of Groningen

RATIONAL CHOICE SOCIOLOGY IS, among other things, an attempt to combine the advantages of theory-guided research, as found in economics, with the strong empirical tradition of sociology. In order to succeed in this endeavor where previous attempts did not, it is necessary to find new methodological tools. In order to find an adequate solution, it is first necessary to find out why a combination of these advantages did not succeed in the past. It is then necessary to bring to bear the methodological developments in the recent past, especially the following points: First, the disaggregation of utility theory into a fixed core of assumptions on human nature and a variable belt of bridge assumptions that can be subjected to the method of decreasing abstraction (or increasing closeness to reality); and second, the heuristics needed to reduce the uncertainty about appropriate bridge assumptions when using the method of decreasing abstraction. These heuristics include the theory of social production functions, the theory of framing, and the heuristic of a dual structure of explanation. With the aid of these tools, it is possible to work out models that are clearly theory-guided in their earlier versions, while their realism can be adapted in later versions. Insights from neoclassical economics and from traditional sociology are then essential in the entire process of model development.
INTRODUCTION

Recently the method of decreasing abstraction has been elaborated as a means to integrate economic, sociological, and psychological lines of research without losing the analytical power of the economic approach or the descriptive advantages of the sociological and psychological approaches. As it turns out, this method also allows for a stronger integration of model building with empirical research in general. What does the method look like? In a variety of different papers (Lindenberg 1985, 1990), I have worked out this method, and in this overview its main points will be summarized.¹

Theories are subject to conflicting claims. First, the more empirically accurate a theory in prediction and explanation, the better. Second, the more diverse the fields within which a theory can be applied, the greater the analytical power of the theory and the more theory-driven the analyses can be. In order to have theory-driven analyses, one has to simplify the description of phenomena severely; that is, one has to abstract from many features of reality. Thus the theory is rendered empirically less accurate. In order to make the theory empirically more accurate, one has to make it more complex and more tailored to the phenomena in question, thus losing analytical power (see also Coleman 1990, p. 19). For most economists since Adam Smith, analytical power has been the most important point about theorizing, and for many sociologists, the descriptive closeness to social reality has been the important goal, be it in the form of the Durkheimian causal analysis or in the form of the Weberian casuistic analysis. Economists thus generally are unwilling to forego their highly simplified (and therefore often very unrealistic) models in favor of more realistic but analytically less powerful models, and sociologists generally are unwilling to forego descriptive richness. As so often, the truth does not seem to lie in the middle, in doing a bit of both. Adding such "sociological" variables as norms and community to economic models is not a satisfactory solution because this addition does not integrate the presumed behavioral mechanisms involved in rational choice and norm-following behavior. The same holds true for sociological explanations enriched with such "economic" variables as cost and utility. For more than 100 years, another possibility to integrate both desiderata has been discussed: a method whereby one would begin with a very simple model and gradually make it more realistic. For example, Lange (1875) calls this the method of successive approximation to the truth. Later the term method of decreasing abstraction became more widely accepted. Still this method was not elaborated, and economists never got very far with it. To my knowledge, the most advanced attempt in the past to reconstruct this method is Haller's Typus und Gesetz in der Nationalökonome (Type and Law in Economics) [1950]. Inspired by Weber and Sombart, Haller took the assumption of the ubiquity of rational action itself to be a simplification, and he introduced other behavioral principles (e.g., traditionalism) for certain groups (e.g., peasants) in order to make economic models more realistic. But there is a clear difference from Weber's ideal typical method: Haller uses the more "realistic" behavioral assumptions in the original model, coming to new predictions on the macro level. While this attempt was an advance on what had been done before, it ran aground by the fact that, by using different behavioral principles, Haller lost the ability to model the influence of constraints. For this reason, the models turned out to be driven by given behavioral tendencies rather than by social circumstances, a result that ran counter to the very intentions for using the method of decreasing abstraction in the first place. These intentions were after all focused on bringing to bear on economic models sociological insights on the importance of group structure and institutions.

After Haller, the method of decreasing abstraction was not taken up again for the integration of economics and sociology until very recently. Instead the sociologists and psychologists focused on the irreality of economics. For example, the sociologist Daniel Bell wrote that "economic theory is a convenient fiction... but it is not a model of reality. But even as a fictional ideal, it is inherently problematical" (Bell 1981, p. 70). The psychologists Kahneman and Tversky state that the theory of rational choice as used by economists is a normative theory and that "the deviations of actual behavior from the normative model... are too fundamental to be accommodated by relaxing the normative system" (Tversky and Kahneman 1987, p. 68). This discussion underlined the abstractness and irreality of economic models, but it completely ignored the issue of analytical power. Not surprisingly, economists were very reluctant to pick up the suggestions. In this chapter, I present
the bare bones of a method of decreasing abstraction that will allow analytical power and descriptive accuracy. It thereby also pleads for a different understanding of model building. A model should be a collection of different versions, such that the highly simplified versions offer analytical power and the later versions offer more descriptive accuracy.

SOME CORE DISTINCTIONS

Model building has been linked mainly to the achievement of analytical power. The requirement is “keep it as simple as possible.” In order to increase the model's empirical accuracy, one has to add the requirement “make it as complex as necessary.” The method of decreasing abstraction (i.e., decreasing simplification) attempts to achieve theory-driven analyses and empirical accuracy by taking model building to be a sequence of versions of theory in which empirical accuracy is stepwise approached, while the early versions of the theory provide analytical power. In order to achieve this—that is, in order to avoid the pitfalls of earlier attempts—it is essential to observe some methodological distinctions that often have been ignored in the past.

Core Theory and Bridge Assumptions. A core theory consists of a number of guiding ideas that can be made more specific by auxiliary assumptions that bridge the gap between the core and a more or less simplified reality. These auxiliary assumptions therefore are called bridge assumptions. This distinction is to be contrasted with bastard theories, in which core and bridge assumptions are combined into one package. For example, if rational behavior is by definition meant to include gain maximization, then rationality (as a core theory) is inextricably intertwined with gain maximization into one bastard theory. Given such a package, it is not possible to make the assumption about gain maximization more complex (say, by stating the conditions under which it may or may not occur) without simultaneously letting go of the core theory of rationality. Because this is a very unattractive option for theory development, bastard theories should be avoided and bridge assumptions should be kept separate from the (quite empty) core.

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Individual Theories. The second important distinction pertains to differences in the goals of a discipline. Those goals profoundly affect the requirements concerning the individualistic theories used in an explanation (see Lindenberg 1985). The main task of sociology (and economics) is to analyze social systems. Coleman states this as follows: “The focus must be on the social system whose behavior is to be explained. This may be as small as a dyad or as large as a society or even a world system, but the essential requirement is that the explanatory focus be on the system as a unit, not on the individuals or other components which make it up” (Coleman 1990, p. 2). The analytic primacy thus lies at the aggregate level. Yet the explanation of social systems is based on explaining the mechanisms that go on in the system and that produce the system effects. In sociology, all such mechanisms involve purposive action of human beings. For this reason, the theoretical (or explanatory) primacy lies on the individual level. For easy identification, I have called this individualistic level individual. A different situation can be found for psychology. Here both the analytical and the theoretical primacies lie on the individual level; that is, psychologists are interested in analyzing phenomena of individuals, and for this purpose they use theories pertaining to the individual level. The explanatory task of the individualistic theories in psychology (individual) is thus different from that of individualistic theories in economics and sociology (individual). Individual theories are used to provide explanations for phenomena on the aggregate level, and individual theories cannot be expected to do the job even though they often may be the more realistic theories.

Individual theory must meet a variety of requirements, and I will mention here the three most important ones (see Lindenberg 1985).

1. The more a theory allows fruitful application without much information about each individual to whom it is applied, the better it can function in an individual context. Individual theories are mostly quite greedy with regard to information about each individual. For learning theories, it would be most appropriate to have the reinforcement schedules; for cognitive theories, it would be most appropriate to have information on schemas and biases; for psychodynamic theories, one would require information about individual traumas and so on.
HEURISTICS I: THE LOGIC OF THE SITUATION

A core theory that satisfies these three requirements for an individual theory more than others is a model of man that seems to emerge more and more as a common core of the social sciences (see Lindenberg 1990): RREEMM (an acronym for Restricted, Resourceful, Expecting, Evaluating, Maximizing Man). This core theory of action is as simple as the bridge assumptions that are made for each element. For example, with regard to “evaluating,” a simple linear utility function may be assumed, and in a later version of the model a nonlinear function (say, with decreasing marginal utility) may replace the simple assumption of the first model. A still more complex (and possibly more realistic) assumption would be that utility depends on the way the situation is cognitively framed by the actor. Thus psychological assumptions can enter as bridge assumptions without replacing the individual core theory. From this example, it can be seen also that the increasing complexity of bridge assumptions makes the model more realistic but also renders it analytically less powerful because it greatly increases the information that is needed per situation and per individual. For this very reason, the bridge assumptions should at first be as simple as possible and then be stepwise adapted to make the model as complex as necessary. Making bridge assumptions of a cognitive kind more realistic means that the action theory is moved more in the direction of an individual theory. For this reason, a definite order of priority exists: Make the structural bridge assumptions more realistic first and only then withdraw the simplified cognitive assumptions, if necessary. Thus one should work first on making the restrictions more realistic and then the goals and only then the expectations.

Not every core theory allows this stepwise development as well as any other. For example, as we have seen in Haller’s case, if one uses as a core theory the idea that people are either rational or traditional, then one cannot go very far with the development of bridge assumptions. By contrast, RREEMM offers an immediate guide to bridge assumptions: an analysis of the action situation (the “logic of the situation,” as Popper would say). Notice that the questions generated by this heuristic are constraint-driven. What are the restrictions? What are the goals? What are the expectations in the action situation? In order to make this heuristic work—that is, in order to be able to bring sociological insights into model building—two other heuristics are essential.

HEURISTICS II: SOCIAL PRODUCTION FUNCTIONS AND FRAMING

Due to role-playing man, sociologists had approached preferences not from the standpoint of choice under constraints but from the standpoint of social control. Two sociological messages are involved in the traditional sociological treatment of preferences. One is the idea that because of socialization effects on internalization, one does not have to bother about choice. How is behavior socially determined? By socializing an individual in such a way that he or she will want to do what he or she is socially expected to do. Thus “wanting” was removed from choosing. The other message is that preferences are products of social processes. The trouble is that both messages are linked: If socialization is successful, the desired
(preference) is socially engineered to coincide with the desirable (value) and the individual will act according to his or her preferences. Through this link, it has proven difficult to use the second message without endorsing the first. The first message, however, is incompatible with a constraint-driven heuristic (a logic of the situation). What is needed is a way to use the important sociological insight on the social origin of preferences without thereby throwing choice out of the analysis.

Recent developments do offer a likely solution. They center around a change in economics that has come about as a response to nonmarket applications and can be summarized by a shift from man the consumer to man the producer. What is so important about this shift is that it allows preferences to appear entirely in an instrumental context whereby they would have to be explained as part of the social structure and thus as part of the given constraints.

This feat is accomplished by the assumption of two kinds of preferences (see Stigler and Becker 1977): universal preferences (goals) that are identical for 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 thus can be explained in a constraint-driven approach. Technically speaking, only one utility function exists for all humankind, but systematically different production functions exist for different kinds of people. Buying a particular good is now not an act of consumption but the purchase of a means of production, such as a compact disc for the production of music pleasure.

This approach fits nicely into the bridge-assumption methodology outlined above because the specification of production functions can be seen as providing bridge assumptions about instrumental preferences. So far so good. But without a specification of what the ultimate goals are, the old danger of ad hoc theorizing looms large and little has been gained. For this reason, Becker’s approach was further developed into what may be called the social production function approach (see Lindenberg 1986, 1991). In the social sciences, two general human goals have emerged time and again. In economics, physical well-being has played an important role as general goal, making any form of effort costly, rendering an increase of leisure a benefit, and focusing attention on consumption of goods and services. In sociology, social approval has always been considered to be a crucial general human goal. Thus status, behavioral confirmation, reputation, prestige, respect, deference, dignity, and so on are various forms of one general goal. Adam Smith had worked with these two goals already in the Theory of Moral Sentiments, and he included the craving to get approval from your own self, which observes your actions. These goals are central to anybody and everybody, and therefore the means people have to reach these goals are of utmost importance to them—so important that a systematic threat to these means may cause a revolution (see Lindenberg 1989a). These means vary with social position and are called social production functions. They work like standard operating procedures for the production of one or both of the general goals. The more clearly role expectations are formulated and sanctioned, the clearer the social production functions are. When the positive and/or negative sanctions connected to the expected behavior decline, then the individual will look for alternative means of getting physical well-being or social approval. And because the individual is assumed to be resourceful, he or she will look actively for alternatives rather than follow the role expectations until somebody else tries to resocialize him or her.

Let us take an example (see Lindenberg 1991). In a traditional industrial social structure with segregated gender roles, the man has his job and his life-style as sources of social approval, and the woman has the making of a home and the raising of the children as sources of social approval. When making a home and raising children yield less and less social approval, women will seek to adapt their social production functions, for example by entering the labor market if they have not done so already for the sake of money (physical well-being). Here the difference between the old and the new situation is quite apparent. In sociology, it has been known for a long time that social approval is an important reward connected to holding a job (see for example Morse and Weiss 1955), but due to “role-playing man,” this insight could not be theoretically worked into a theory of labor market participation until “the logic of the situation” replaced “automatic control of human action by internalization” as a guiding heuristic. Notice that effects of norms on behavior are entirely compatible with a social production function approach. Norms heavily influence social production functions.

The social origin of preferences was only one important stabilizer of the internalization heuristics in sociology. The other was
the important insight that the definition of the situation matters. Again this insight was linked to the idea that the individual is steered automatically by internalized norms. Because men would be socialized into defining situations in the “appropriate” way, one could assume safely that they are steered automatically by norms. When one introduces choice under constraints, one has to find a way to incorporate the impact of the definition of the situation. Up to now, this has not been done satisfactorily. The introduction of subjective probabilities in the SEU (Subjectively Expected Utility) theory was a step in the right direction, but it did not incorporate the structuring of the situation, including the selection of alternatives. Various other suggestions (such as Simon 1957, and Kahneman and Tversky 1979) offered improvements, but they were individual; theories and therefore did not fit the distinction between core theory and bridge assumptions, a distinction that is crucial for the method of decreasing abstraction. Goffman wrote Frame Analysis (1974), which offers an elaborate analysis of framing in everyday life. Giving many examples, Goffman shows how vulnerable the organization of experience is to joke, dream, accident, mistake, misunderstanding, deception, etc., and how we use all sorts of stories and scenarios to stabilize the frames. While Goffman’s work clearly shows the importance of social processes for framing, it does not offer a behavioral theory that combines rational choice and framing.

Learning from all three approaches, I elaborated a framing theory, called discrimination model, in the early 1980s. For reasons of space, it is not possible to present this model here in great detail (for a recent formulation, see Lindenberg 1989b).

The basic idea is that people have various competing potential goals in any action situation and that one goal wins out. It will then structure (i.e., “frame”) the situation by providing the criteria for selecting and ordering the alternatives. The winning goal is the one that discriminates best; that is, the one that provides the most structure by creating the largest difference between the alternatives. This difference translates itself directly into choice probabilities with which the alternatives are chosen.

For example, you bought a theater ticket for $100 and, before you leave for the theater, it begins to rain heavily; you know that you will get quite wet even with an umbrella. Three obvious candidates for goals exist in this short scenario: the anticipated enjoyment of the show, the wish to avoid getting wet, and the wish to avoid throwing away $100 by not going. Due to a part of the theory on the motivating power of loss (not presented here), the prediction is that unless unusual circumstances arise about which we were not told (for example, you are meeting your childhood sweetheart at the show or you just won big in a lottery), loss avoidance will be the frame for this situation. One hundred dollars for a ticket is quite a lot, and if you stayed at home in order not to get wet, this amount of money would be lost without compensation. This loss would bother you so much that the utility difference between going and not going (in terms of loss) is larger (i.e., the choice probabilities of the alternatives are farther apart) than the difference between going and not going in terms of enjoyment of the show or of not getting wet.

Although one goal won out, the other two goals do not simply vanish from the situation. The effect of the given utility difference between alternatives on choice probabilities is enhanced or lowered with changes in the salience of the frame, that is, with changes in the other potential goals that influence this salience. In our case, the enjoyment of the show increases the salience of the loss frame because it favors going (as does the loss frame), and the prospect of getting wet will lower it because it favors staying. Background goals thus influence behavior by affecting the salience of the frame.

Frames can and will change. Frame switches allow seemingly irrational (inconsistent) behavior across situations. They also explain apparent preference changes without the assumption of unstable preference structures. For example, when the power of the present frame to discriminate between alternatives is reduced greatly (when the choice probabilities approach an even distribution over the alternatives), then the frame is likely to switch and the goal that potentially discriminates best between alternatives will become the new frame. Such a reduction in the ability to structure the situation can come about either through changes in the expected outcome of each alternative or through a reduction in salience. In the example, imagine that before you leave for the show your spouse hands you $90 of the $100 you had originally given to him or her to pick up the ticket for you; a mixup had occurred, and the ticket really cost only $10. In that case, the potential loss would be so small that the probability of “not going”
approaches the probability of "going," which renders the situation virtually unstructured. As a result, a new frame will emerge from the background (in this case, probably the wish not to get wet). So hearing the news of the price of the ticket is likely to make you stay at home.

The important difference with the SEU theory is this: In the SEU theory, the weight of each outcome is independent of the structuring of the situation; in the framing theory, the weight of a goal (utility argument) does not depend just on the expected utility of the outcome but also on the position of this goal (either as frame or as background). Thus changes in outcomes that affect only the salience of the frame have a relatively much smaller effect on behavior than do changes in outcomes directly relating to the frame. For example, in light of the loss frame, hearing just before you leave for the theater that the show has gotten bad reviews will have only a relatively small effect, while hearing that the ticket was less expensive than you thought will have a relatively large effect. Had the frame been "enjoyment of the show," you would have been much more sensitive to hearing about bad reviews and much less sensitive to hearing news about the price of the ticket.

In other words, if I can influence the way you structure the situation, I can thereby also influence your sensitivity to various factors.

The need to bring in this framing theory as a complex bridge assumption will not arise in every model. In early versions of model development, it is quite appropriate for the researcher to ignore the distinction between background and frame and to decide on the basis of knowledge of the action situation which of the utility arguments (goals) are operative. The researcher thereby abstracts from the fact that a situational influence exists on the weight of the utility arguments, just as he or she might abstract from the fact that the actor is not well informed. At this point, the need for the framing theory arises because we need to know how the simplifying assumptions can be made more concrete. The advantage of postponing the introduction of framing effects is that thereby the emphasis on structural constraints is stronger. Investigate social structural conditions before you introduce indirect social effects that are operative only via framing. But when we have reached the point at which we want to introduce framing, we need a framing theory that allows us to expand the previous (structurally oriented) model rather than to replace it with a psychological one. This is only possible with an individual model framing theory. The other two alternatives are very unattractive: Either we follow Hailer's procedure by working with behavioral "tendencies" (say, maximizing vs. satisficing), or we follow Kahneman and Tversky's suggestion of replacing the behavioral theory with a more complex cognitive theory. In the first case, we make it very difficult to introduce constraints. In the second case, we introduce a theory that does not satisfy the three crucial requirements for a behavioral theory geared toward explanation on the aggregate level: (a) fruitful application without much information about each individual to whom it is applied, (b) minimal distance between the individual and the collective level, and (c) explicit bridge assumptions that can vary in concreteness. Thus the important point is to be able to introduce cognitive complexity in such a way that we retain the ability for model building. The framing theory described above was designed for that purpose.

OTHER ASSUMPTIONS

The method of decreasing abstraction is not restricted to bridge assumptions. All assumptions that are made in model building are subject to the method. And thus a heuristic should exist for the other assumptions as well. What kind of assumptions are they?

The combination of the analytical primacy of society (or the collective level) with the theoretical (or explanatory) primacy of the individual necessitates a dual structure of explanation (see Lindenberg, 1977). The first step explains individual effects in the social context; the second step explains how the individual effects are "transformed" into a collective effect. For this reason, one also needs actor assumptions and transformation assumptions. And because the model has to be tested, one also needs measurement assumptions. Let me briefly take up each of these kinds of assumptions.

Before one can make bridge assumptions on restrictions, goals, and expectations for actors, one first has to decide on the kind and number of actors to be considered. Because of the requirement of model building to be "as simple as possible," one should begin with as few actors as possible. But because of the analytical primacy of
The collective, the minimum number of actors should be two rather than one. Yet this seemingly simple requirement could introduce a high degree of complexity of strategic behavior even in the early stages of model development. In order to avoid dealing with strategic behavior at this stage, one can leave the actors implicit altogether by combining only variables on the aggregate level, such as "the tighter the labor market, the lower the rate of reemployment." The implicit actors are minimally the people looking for jobs and the employers, but because they are not made explicit, no bridge assumptions are to be made about them. And because it remains entirely on the collective level, no transformation assumptions are to be made. Only the measurement assumptions concerning both variables can be improved from "quick and dirty" measures to complex and detailed ones. When, in the next step, actors are explicitly introduced, one can begin with one central actor and introduce the other actor only via restrictions on this central actor. In the next step, one can model both actors as central actors, each restricting the other. Thus one should have specific reasons for beginning with strategic interaction (for instance in [undecomposed] game theoretic models).

The heuristics for assumptions for the transformation step are not well worked out. In contrast to bridge assumptions, the transformation assumptions are not guided by the heuristics of situational analysis. For this reason, I have suggested first the (partial) definition of the dependent variable in terms of interdependencies or aggregates. Second, I have suggested the use of background knowledge on the subject matter under investigation in order to locate relevant conditions for the transformation. In the simplest case, this will lead to a relative unproblematic aggregation; in a more complex stage, one will look for aspects that differentially influence the individual effects, that is, aspects that create interaction effects. Thereby a distribution of individual effects more complex than linear aggregation can be explained. Depending on the dependent variable, still other kinds of transformation are possible, but I will not discuss them here (see Lindenberg 1977).

The reason that measurement assumptions are also subject to the method of decreasing abstraction is that some inverse relationship exists between simplification and cost. This relationship can be quite imperfect and still exert an important influence on the method of decreasing abstraction. So far, no explicitly worked out heuristic exists for measurement assumptions, other than the maxim that the measurement assumptions should be made on the basis of substantive theory. Of course, here as for the other assumptions, the general maxim is: Choose among the many possible assumptions the one that leaves least uncertainty about the further development of assumptions. By including measurement assumptions explicitly in the method of decreasing abstraction, the modeling part of an analysis is also explicitly extended to the testing part. For example, important variables often are measured only by a rough proxy. Take "labor market opportunity" measured by the number of unfilled vacancies. This measure is very rough indeed because it ignores the fact that labor is heterogeneous, that local segments exist, and that labor supply (and thus competition) in a particular category may still be high even if many vacancies exist. When the empirical results are disappointing, then applying the method of decreasing abstraction at this point to the measurement assumptions would be preferable to applying it to bridge assumptions or to the actor assumptions.

Where to Stop. The last point about the method of decreasing abstraction is the question of where to stop. It is difficult to provide a definite criterion, but I suggest the pragmatic stance that if the added satisfaction of the last step of model development does not outweigh the extra trouble one has taken for this last step, one should not only stop but actually go back one step. In addition, I suggest that one attempt to find the threshold for different subgroups. For one group, the most complex version of the model may be needed, but for another group (for example, one that is much less restricted in its action), a far simpler version of the model can be used without much loss of (relative) descriptive and explanatory power.

SUMMARY

By way of summary, the major principles leading to the importance of the method are the following:
THEMES OF ADVOCACY

• Model building means that an explanation is as simple as possible and as complex as necessary.
• Highly simplified models often have the advantage of great analytical power; highly complex models often have the advantage of realistic descriptiveness.
• Theories should allow high analytical power and a high degree of realistic descriptiveness. In order to achieve this, they should be constructed according to the method of decreasing abstraction.

The major principles of the method are the following:

• Theories should be considered as sequences of models in which the first model is highly simplified and each subsequent model is more realistic.
• Most theories in sociology should explain phenomena on the collective level, and these explanations should be grounded in theories on the individual level.
• The theories on the individual level should not be psychological theories but combinations of a general model of man (the core theory) and bridge assumptions.
• The bridge assumptions should be developed in such a way that they are simple in the beginning models and more complex in the later models.
• Bridge assumptions should be made on the basis of an analysis of the action situation and on the basis of the heuristics of social production functions and of framing.
• Structural bridge assumptions should be made more realistic before one begins to do the same to cognitive bridge assumptions.
• Not just bridge assumptions, but also actor, transformation, and measurement assumptions should be subject to the method of decreasing abstraction.
• Aside from the possibility of beginning with an implicit actor model as a baseline model for later development, actor assumptions should be made in such a way that one begins with one central actor constrained by other actor(s). Strategic behavior should be introduced only in later versions of the theory, if at all.
• Transformation assumptions should begin with simple aggregation and move on to interdependencies, at first concentrating on interaction effects.

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• Measurement assumptions should be made more complex on the basis of substantive theory.
• For all kinds of assumptions subject to the method of decreasing abstraction, the maxim holds: Choose among the many possible assumptions the one that leaves least uncertainty about the further development of assumptions.
• Stop the theory development when the additional complexity does not yield worthwhile results, and then go back one step for the final model.
• See which models of your theory can be applied to which subgroups of the population under investigation. No presumption exists that every subgroup should be explained with a model of equal complexity.

NOTES

1. A more elaborate paper is presently being prepared, with a more extensive overview of modeling preferences and difficulties in economics and the possibilities of improving this modeling through sociological insights without losing the advantages of modeling.
2. Sometimes psychologists even use theories below the level of individuals, such as physiological theories. But psychological theories of behavior refer by and large to the individual as the central unit.
3. Man refers to humans throughout the chapter.
4. See Popper 1960, pp. 147ff.
5. Frank (1990, p. 54) observed that economists are quick to defer to psychologists, sociologists, and philosophers when asked what people really care about. "As a practical matter, however, economists . . . are content to assume the consumer's overriding objective is the consumption of goods, services, and leisure—in short, the pursuit of material self-interest."
6. The general utility function is the one that links physical well-being and social approval to utility. All lower level goals are specified in production functions, which are not idiosyncratic but socially determined.
7. Coleman says that he prefers to keep the behavioral theory simple in order to be able to introduce complexity in the other parts of the model and still keep the model manageable. "I have chosen to trade off as much psychological complexity as possible in order to allow introduction of greater amounts of complexity in . . . the 'social organizational' components" (Coleman 1990, p. 19). This clearly indicates the emphasis on direct social constraints. Because Coleman does not distinguish between core theory and bridge assumptions, however, it is not quite clear when this trade-off takes place and whether he would consider varying the trade-off in different elaborations of a model.
REFERENCES


