

Contributors

RAYMOND BOUDON is Professor of Sociology at the University of Paris-Sorbonne (Paris IV).

TYLER COWEN is Professor of Economics at George Mason University.

JON ELSTER is Robert K. Merton Professor in the Social Sciences at Columbia University.

DIEGO GAMBETTA is Professor of Sociology at Oxford University.

PETER HEDSTRÖM is Professor of Sociology at Stockholm University.

GUDMUND HERNES is Minister of Health in Norway.

TIMUR KURAN is Professor of Economics and Faisal Professor of Islamic Thought and Culture at the University of Southern California in Los Angeles.

THOMAS C. SCHELLING is Professor of Economics at the University of Maryland at College Park.

AAGE B. SØRENSEN is Professor of Sociology at Harvard University.

ARTHUR L. STINCHCOMBE is Professor of Sociology at Northwestern University.

RICHARD SWEDBERG is Professor of Sociology at Stockholm University.

AXEL VAN DEN BERG is Professor of Sociology at McGill University.

1. Social mechanisms: An introductory essay

PETER HEDSTRÖM AND RICHARD SWEDBERG

Introduction

The main message of this book is that the advancement of social theory calls for an analytical approach that systematically seeks to explicate the social mechanisms that generate and explain observed associations between events. It might appear obvious that every social theory, worthy of its name, should be explanatory. But upon closer examination, it turns out that what often goes under the rubric of social theory, should more properly be viewed as conceptual or sensitizing schemes, and not as explanatory theory proper.¹ Much of modern social theory has a tendency – just like the Parsonianism of yesterday – to label, relabel, and to describe rather than to explain.² In the case of sociological theory, our main concern in this essay, a sustained focus on explanatory social mechanisms would allow sociological theory to reconnect with what we consider to be its most promising and productive era – namely, middle-range sociology of the kind that Robert Merton and Paul Lazarsfeld tried to develop at Columbia University after World War II.³

This essay is an extended and revised version of Hedström and Swedberg (1996b). We wish to thank Mario Bunge, Mark Granovetter, Barbara Hobson, Ole-Jørgen Skog, Arthur Stinchcombe, Cecilia Swedberg, Michael Tählin, and Lars Udehn for their useful comments. We owe special thanks to Carl-Gunnar Janson for his detailed written comments, and to Alejandro Gil-Villegas and Aage Sørensen for the valuable background information they provided.

¹ In an insightful article by someone who has devoted most of his academic career to general social theory, Göran Therborn (1991:178) notes: "Absent in or marginal to currently prevailing general sociological theorizing is any ambition to explain." See also Jeffrey Alexander's plea in the *Handbook of Sociology* that more attention should be given to "discourse" and less to "explanation" (Alexander 1988:78–81).

² That Parsons had a similar problem to explain, rather than to describe and relabel, is clear. See, for example, George Homans's statement from the early 1960s, with explicit address to Parsons, Shils, and Smelser, that "much modern sociological theory seems to me to possess every virtue except that of explaining anything" (Homans 1961:7).

³ The two best introductions to middle-range sociology are, in our opinion, Robert Mer-

The mechanisms-based approach to social theory should not be confused with a purely descriptive approach that seeks to account for the unique chain of events that lead from one situation or event to another. All proper explanations explain the particular by the general, and as will be demonstrated later, there are general types of mechanisms, found in a range of different social settings, that operate according to the same logical principles. Our vision of an explanatory sociology contains an ensemble of such fundamental mechanisms that can be used for explanatory purposes in a wide range of social situations.

In this chapter, we will describe how the concept of mechanism has been used in the social sciences, especially sociology. We will discuss the explanatory status and importance of social mechanisms, the characteristics of analytical sociology, and the relationship between variable-based and mechanism-based approaches. Thereafter we will illustrate our notion of a general social mechanism with reference to the work of Robert Merton, James Coleman, and Mark Granovetter. The essay ends with a typology of such social mechanisms and a brief guide to the other chapters of the book.

On the use of the concept of mechanisms in the social sciences

An interesting aspect of the mechanism approach is its interdisciplinarity. As an example of this, we refer to contemporary biology.⁴ According to

ton's essay "On Sociological Theories of the Middle Range" and Raymond Boudon's short article "What Middle-Range Theories Are" (Merton 1967; Boudon 1991).

⁴ In modern physics, the term "mechanism" is not used, but many of the explanations are mechanism based. The reason for not using the term itself is of a historical or accidental nature and has to do with the fact that in physics the word "mechanism" is connected to the scientific world view of the 17th century (e.g., Dijksterhuis 1986). It should also be remembered that in the 19th century, thermodynamics popularized the notion of a system, which is broader than that of "mechanism/machine" and allows the analyst to choose the environment of the system according to the purpose of the study. The attempt to conceptualize all phenomena according to the elementary laws of mechanics became impossible after the emergence of field physics in the middle of the 19th century. The 17th-century notion of mechanism spread from physics and astronomy to a number of sciences – such as chemistry and biology – where the term "mechanism" is still used, though with different meanings. The Cartesian notion that organisms can be conceptualized as machines turned out to be very useful, and it became central to a new biological philosophy called "mechanism," which is usually contrasted to that of "vitalism" or the doctrine that life cannot be reduced to mechanics (e.g., Beckner 1967). In the 19th century, the term "mechanism" was

Francis Crick, who shared the Nobel Prize in 1962 for his discovery of the molecular structure of DNA, 20th century biologists prefer to think in terms of "mechanisms" and not "laws." The reason for this is that the notion of "laws" is generally reserved for physics, which is the only science that can produce explanations based upon powerful and often counterintuitive laws with no significant exceptions. "What is found in biology is *mechanisms*, mechanisms built with chemical components and that are often modified by other, later, mechanisms added to the earlier ones" (Crick 1989:138).

In the social sciences, the prevalence of explicitly stated mechanism-based explanations vary widely between the disciplines. These types of explanations are rarely used (explicitly) in history, sometimes in sociology, and quite frequently in economics and psychology. Particularly in cognitive psychology, the notion of mechanism plays a key role. To cite a well-known work, "The information-processing approach [in cognitive psychology] assumes that perception and learning can be analyzed into a series of stages during which particular components ('mechanisms') perform certain transformations or recoding of the information coming into them" (Bower 1975:33).

Economists often see themselves as thinking in terms of mechanisms, as opposed to sociologists and historians, who are believed to be more interested in social institutions. Schumpeter, for example, writes that "by economics – or, if you prefer, 'economics proper' – we denote the interpretive description of economic mechanisms that play within any given state of those institutions [studied by economic sociology], such as market mechanisms" (Schumpeter 1989:293). The one mechanism that economists relate most of their analyses to – their master mechanism, so to speak – is the market. That the market can be seen as a "mechanism" goes back to the 18th century, when economics (via, e.g., Adam Smith) became influenced by the Newtonian–Cartesian worldview, and it has become so self-evident to contemporary economists that the market is a mechanism, that they often use the terms "market" and "market mechanism" synonymously.

Much of neoclassical economics in the 20th century can be understood as an attempt to explain ever more aspects of the economic process

disconnected from the metaphor of the machine and instead became linked to that of the system.

through the mechanism of the market: production as well as consumption and distribution. The notion of mechanism is furthermore implicit in the idea of equilibrium, as Tyler Cowen points out in his survey of the use of mechanisms in economics (Chapter 6). It is worth noting that economists' talents for thinking in terms of mechanisms often only becomes clear to non-economists when they go beyond the traditional boundaries of their discipline. Examples of this can be found in Albert Hirschman's *Exit, Voice, and Loyalty* (1970) and even more so in Thomas Schelling's *Micromotives and Macrobehavior* (1978).⁵

As economists gradually have expanded the boundaries of their discipline to include a range of topics traditionally considered the domain of sociologists, such as the family and organizations, the difference between the disciplines to an increasing extent have come to concern the types of theories being used. One such difference, but by no means the only one, centers exactly on the importance attributed to explanatory mechanisms. Comparing labor market sociology with labor economics, Aage Sørensen (1990) has noted that most labor market sociologists think of theory

as having to do with which variables should be included in the equations and how these variables relate to other variables – and not as something which is about which mechanisms produce the observed associations in the variables. This is where there is a huge difference between sociological research and economic research in this area; and the difference is very much to the disadvantage of the sociologist. (308)

The use of mechanisms in sociology

Sociology, as we noted earlier, lags behind economics and many other sciences when it comes to explicitly formulated mechanism-based theories. The term "mechanism" is quite common in sociological works and has a long history, but it is nearly always used in a casual everyday sense. As an illustration of this tendency, we cite what is in all likelihood its earliest

⁵ The problem that Hirschman addresses has to do with what happens when an organization (including a firm) begins to decline. According to Hirschman, two "mechanisms of recuperation" are usually triggered off in this situation, one that is discussed primarily in economics ("exit") and one that is focused on primarily by political scientists ("voice"). Schelling's *Micromotives and Macrobehavior* is the classic in the area of social mechanisms. The essay on segregation ("Sorting and Mixing: Race and Sex") is the most famous, but we also would like to draw attention to Schelling's attempt to produce a catalogue of social mechanisms in "Thermostats, Lemons, and Other Families of Models."

use in sociology. In 1905 Albion Small published a textbook in sociological theory, *General Sociology*, in which he had included a list of the most important sociological concepts. Among Small's examples were "society," "social structure," "social status," and "social mechanism" (Small 1905:401–2). Nowhere in the text of his work, however, does Small explicate the concept of social mechanism in a serious manner.

Small's concept of a social mechanism is, as in today's sociology, used in a casual everydayish way. Robert Merton's term for this type of use is "proto-concept," and he explains its meaning in the following manner: "a proto-concept is an early, rudimentary, particularized, and largely unexplicated idea . . . ; a concept [on the other hand] is a general idea which once having been defined, tagged, substantially generalized, and explicated can effectively guide inquiry into seemingly diverse phenomena" (Merton 1984:267).

Among the sociological classics, the term "mechanism" is rarely used, even if the idea itself is present.⁶ Among the best-known examples is the mechanism that *The Protestant Ethic* is centered around, more precisely the way that ascetic Protestantism at one point in history led to changes in people's economic behavior. Thanks to a believer's conversion to ascetic Protestantism, to recapitulate Weber's argument, he or she began to set a religious premium on a certain type of behavior, the unintended consequence of which was a novel norm for how to act in economic questions.⁷ The works of Simmel and Durkheim similarly contain a number of important mechanisms. Simmel's use of *tertius gaudens* is one example of this, as is Durkheim's analysis of the way that the balance between individual and group affects the suicide rate.

An explicit use of the concept of "mechanism" does not seem to have emerged in sociology until after World War II. In our opinion the most suggestive discussion of the concept is to be found in the writings of Robert Merton, who brought together the idea of mechanism with that of

⁶ Weber, for example, rarely used the term "mechanism" ("Mechanismus") except in his analysis of bureaucracy, where it is more or less synonymous with "machine" (Weber [1921–2] 1978:961, 967, 988; Weber as cited in Marianne Weber 1975:416–17). In *Zwischenbetrachtung*, Weber makes the following statement, which sums up the situation brought about by Descartes and Newton: "The tension between religion and intellectual knowledge definitely comes to the fore wherever rational, empirical knowledge has consistently worked through to the disenchantment of the world and its transformation into a causal mechanism [kausalen Mechanismus]" (Weber 1946:350; emphasis added).

⁷ For a discussion of this and many other mechanisms in Weber's work, see Richard

middle-range theorizing (Merton 1967).⁸ Merton firmly rejected all attempts to develop general systems of sociological theory and advocated instead that sociological theory should deal with "social mechanisms." The point is to locate a middle ground between social laws and description, Merton said, and "mechanisms" constitute such a middle ground.

In *Social Theory and Social Structure*, Merton defines social mechanisms as "social processes having designated consequences for designated parts of the social structure" and argues that it constitutes the main task of sociology to "identify" mechanisms and to establish under which conditions they "come into being," "fail to operate," and so on (Merton 1968:43–44). Merton briefly discusses concrete mechanisms that determine reference groups, create dissonance, and articulate role-sets.⁹ In our opinion the most important contribution of his essay, however, is the view of mechanisms as elementary building blocks of middle-range theories.

After the demise of the Columbia School, there has been little serious discussion in sociology of mechanism-based theorizing. There exists only one exception, as far as we know, when it comes to a general meta-theoretical discussion within sociology, and that is a recent article by Arthur Stinchcombe: "The Conditions of Fruitfulness of Theorizing about Mechanisms in Social Science" (1991, revised version 1993). In this article, Stinchcombe correctly observes that "we do not have a sufficiently supple armory of mechanisms for making social science theory" (Stinchcombe 1993:24). He defined the concept of mechanism in the following way:

Mechanisms in a theory are defined here as bits of theory about entities at a different level (e.g., individuals) than the main entities being the-

Swedberg, *Max Weber and the Idea of Economic Sociology* (forthcoming, Princeton University Press).

⁸ Merton's work on middle-range theory goes back to his critique of Parsons at the 1947 meeting of the American Sociological Association (see Merton, 1948). Also, Parsons discussed the concept of mechanism, especially in his work from the early 1950s (see, e.g., Parsons 1951:201–325, Parsons and Shils 1951:125–49). Parsons's view, however, was marred by his functionalism as well as by his attempts at grand theory, and the function of social mechanisms was basically reduced to that of maintaining the social system when this was threatened in some manner. As Lars Udehn has pointed out to us, George Lundberg also uses the concept of social mechanisms in *Foundations of Sociology* (1939). Lundberg argued for a common-sense approach to the notion of mechanism, often with functionalist overtones.

⁹ To this can be added a few other more general mechanisms that were to emerge from Merton's own work as well as from Columbia Sociology in general: the two-step model of communication, the self-fulfilling prophecy, the Matthew Effect, and the diffusion mechanism of *Medical Innovation* (Coleman, Katz, and Menzel 1966).

orized about (e.g., groups), which serve to make the higher-level theory more supple, more accurate, or more general. (Stinchcombe 1991:367)

The examples that Stinchcombe uses to illustrate his definition include maximizing individuals (on the lower level) who create a market through their actions (on the higher level) and molecules (on the lower level) that under certain conditions turn into gas (on the higher level).

What Stinchcombe is talking about are indeed important types of mechanisms, but there also exist other types of mechanisms, as we will suggest below. A much broader, as well as more differentiated, concept can be found in the work of Jon Elster, who has clearly done more than anybody else to advance mechanism-based theorizing in the 1980s and 1990s.¹⁰

The explanatory importance of social mechanisms

The core argument of this chapter is that the identification and analysis of social mechanisms is of crucial importance for the progress of social science theory and research. But what exactly is a mechanism, and why should we focus on mechanisms rather than on statistical associations or other forms of relationships between the entities of interest?

It is far from trivial to provide a precise yet sufficiently general definition of a social mechanism that captures the essence of the concept. As suggested by Harré (1970), one key defining characteristic of an explanatory mechanism is the function it performs in an explanatory account. Assume that we have observed a systematic relationship between two entities, say *I* and *O*. In order to explain the relationship between them we search for a mechanism, *M*, which is such that on the occurrence of the cause or input, *I*, it generates the effect or outcome, *O*. The search for mechanisms means that we are not satisfied with merely establishing systematic covariation between variables or events; a satisfactory explanation requires that we are also able to specify the social "cogs and wheels" (Elster 1989:3) that have brought the relationship into existence. As Schelling emphasizes in Chapter 2, a mechanism can be seen as a systematic set of statements that provide a plausible account of how *I* and *O* are linked to one another.

¹⁰ Many of Elster's ideas are distinctly summarized in the chapter entitled "Mechanisms" in *Nuts and Bolts for the Social Sciences* (1989:3–10), but the reader is also referred to the more detailed discussion in many other works (see, e.g., Elster 1989, 1991, 1992, 1993).

This view of causal explanations differs in important respects from the classic covering-law model as advocated by Carl Hempel and his followers (see Hempel 1942, 1962). According to Hempel, an explanation of an event entails subsuming the event under a general law. A satisfactory explanation therefore must specify the general covering law and the conditions that make the law applicable in the specific case.¹¹ According to Hempel, deterministic laws are quite unlikely in the social and the historical sciences. The "laws" that can be invoked in the social sciences are instead of a probabilistic nature (i.e., they state that the occurrence of a particular event will come about with such and such probability if certain specified conditions are at hand).

Since this form of explanation simply entails applying a general law to a specific situation, the insights offered by the exercise are directly proportional to the depth and robustness of the "probabilistic law." If this law is only a statistical association, which is the norm in the social and historical sciences according to Hempel, the specific explanation will offer no more insights than the law itself and will usually only suggest *that* a relationship is likely to exist, but it will give no clue as to *why* this is likely to be the case. For these reasons, we are inclined to agree with von Wright's position that it is better "not to say that the inductive-probabilistic model [of Hempel] explains what happens, but to say only that it justifies certain expectations and predictions" (von Wright 1971: 14).

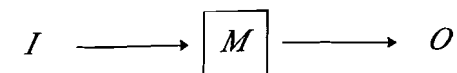
The covering-law model provides justification for the use of "black-box" explanations in the social sciences because it does not stipulate that the mechanism linking *explanans* and *explanandum* must be specified in order for an acceptable explanation to be at hand. This omission has given leeway for sloppy scholarship, and a major advantage of the mechanism-based approach is that it provides (or encourages) deeper, more direct, and more fine-grained explanations. The search for generative mechanisms consequently helps us distinguish between genuine causality and coinci-

¹¹ Hempel (1942) uses the example of an automobile radiator cracking during a cold night to illustrate the logic of his proposal. The general laws cited in the explanation would need to refer to how the pressure of water changes with changes in temperature and volume, and the specific circumstances referred to would be conditions such as the temperature during the night and the bursting pressure of the radiator. A proper explanation has been proposed if, and only if, the proposition about cracking of the radiator can be logically deduced from the sentences stating the laws and the specific circumstances.

dental association, and it increases the understanding of why we observe what we observe.

The role that the search for mechanisms plays in distinguishing between spurious and real associations can be illustrated by the recent controversy surrounding possible health effects of electromagnetic fields. Some epidemiological studies have found an empirical association between exposure to electromagnetic fields and childhood leukemia (see Feychting and Ahlbom 1993). However, the weight of these empirical results are severely reduced by the fact that there exists no known biological mechanism that can explain how low-frequency magnetic fields could possibly induce cancer (ORAU 1992). According to Bennett (1994), it is furthermore extremely unlikely that a mechanism will ever be found, because such a mechanism would have to violate well-established physical principles. The lack of a plausible mechanism increases the likelihood that the weak and rather unsystematic empirical evidence reported in this epidemiological literature, simply reflects unmeasured confounding factors rather than a genuine causal relationship (Hedström 1994a).

The distinction between black-box explanations and mechanism-based explanations can be illustrated in more general terms with the following example, which is adopted from the work of Bunge (1967). Assume that we have observed a systematic (nonrandom) relationship between two types of events or variables, *I* and *O*. The way in which the two sets of events or variables are linked to one another is expressed with the mechanism, *M*:



What characterizes a black-box explanation is that the link between input and output, or between *explanans* and *explanandum*, is assumed to be devoid of structure, or, at least, whatever structure there may be is considered to be of no inherent interest (perhaps because it cannot be observed or because *O* can be predicted even though the mechanisms linking *I* and *O* are unknown).

In sociology the most systematized form of black-box explanation can be found in the so-called causal modeling approach (see Duncan 1975), which will be discussed more fully later. In the causal-modeling tradition, the explanatory "mechanism" simply is a regression coefficient linking *I* and *O*, and this regression coefficient (if the model includes all relevant

variables) is supposed to describe the causal influence of *I* upon *O*. The approach advocated here does not rest with describing the strength and the form of the relationship between the entities of interest but addresses a further and deeper problem: how (i.e., through what process) was the relationship brought about?¹²

Consider the example of poisoning. It would be possible to estimate the parameters of an equation describing the relationship between the intake of, say, strychnine and the risk of dying. If the model had the correct functional form, we might even have established a "covering law" of the dose-response relationship, which could be used for predicting the likely outcomes of other occurrences of strychnine intake. But as long as we have not specified the mechanisms that link strychnine intake to morbidity and mortality, the explanation is clearly wanting. By pointing to how strychnine inhibits the respiratory centers of the brain and to the biochemical processes responsible for this paralysis, we provide a mechanism that allows us not only to describe what is likely to happen but also to explain why it is likely to happen (see Bunge 1967).

It is important to note that the mechanisms referred to in the foregoing discussion are mechanisms of some generality, and it is this generality that gives them their explanatory power. Simply making up an ad hoc story tailored to a specific case does not constitute an acceptable explanation. Even moderately talented journalists are able to make up these sorts of ad hoc stories, and, as Arthur Stinchcombe once noted, "a student [of sociology] who has difficulty thinking of at least three sensible explanations for any correlation that he is really interested in should probably choose another profession" (Stinchcombe 1968:13). Serious, noncommonsensical explanations require mechanisms of some generality.

One line of sociological research that illustrates the shortcomings of black-box explanations is research on class and its individual correlates. In empirically oriented sociology, individuals' class belonging has become a popular explanation for various individual-level phenomena such as income (e.g., Kalleberg and Berg 1987) and health (e.g., Townsend and

¹² It should be emphasized that the distinction between "black boxes" and "mechanisms" to some extent is time-bound. In the words of Patrick Suppes (1970:91): "From the standpoint of either scientific investigation or philosophical analysis it can fairly be said that one man's mechanism is another man's black box. I mean by this that the mechanisms postulated and used by one generation are mechanisms that are to be explained and understood themselves in terms of more primitive mechanisms by the next generation."

Davidson 1990). The concept of class might be useful for descriptive purposes where it serves as a shorthand for various aspects of individuals' socioeconomic living conditions, and research in this tradition has produced informative empirical research describing the living conditions of different "classes." Whether the empirical exercise of relating variables describing class and income or class and health also has an explanatory value – in the deeper sense of saying something about why we observe what we observe – is much more doubtful since it does not explicate the causal mechanisms that generated the relationship.

Despite the common sociological rhetoric of describing class as a "determinant" of various individual traits and behaviors, class in and of itself obviously cannot influence an individual's income or health. A "class" cannot be a causal agent because it is nothing but a constructed aggregation of occupational titles. A statistical association between "class" and income, or "class" and health, tells us that individuals from certain "classes" have lower incomes or worse health than others, but it says nothing about why this is the case. To answer such questions, it is necessary to introduce and explicate the generative mechanisms that might have produced the observed differences in average income or health between the occupational groups that the researchers have assigned to different "classes." A statistical "effect" of a class variable in contexts like these is essentially an indicator of our inability to specify properly the underlying explanatory mechanisms. The worse we do in specifying and incorporating the actual generative mechanisms into the statistical model, the stronger the "effect" of the class variable will appear to be.

Methodological individualism

Mechanism-based explanations usually invoke some form of "causal agent" (Bhaskar 1978) that is assumed to have generated the relationship between the entities being observed. It is by explicitly referring to these causal agents that the relationship is made intelligible. In the natural sciences, causal agents come in a variety of forms such as organic reactions in chemistry and natural selection in biology. In the social sciences, however, the elementary "causal agents" are always individual actors, and intelligible social science explanations should always include explicit ref-

erences to the causes and consequences of their actions.¹³ This principle of methodological individualism is intimately linked with the core idea of the mechanism approach: Understanding is enhanced by making explicit the underlying generative mechanisms that link one state or event to another, and in the social sciences, actions constitute this link.

It is useful to distinguish between a strong and a weak version of methodological individualism. The strong version of the doctrine only accepts ‘‘rock-bottom’’ explanations (i.e., explanations that include no references to aggregate social phenomena in the *explanans*). The weak version of methodological individualism takes the same ontological position as the strong version but accepts for the sake of realism nonexplained social phenomena as part of the explanation (see Udehn 1987).

Although the search for rock-bottom explanations usually is intellectually challenging and intriguing, the strategy often is likely to be of limited use when it comes to explaining concrete social phenomena. The reason for this has been aptly described by David Lewis:

Any particular event that we might wish to explain stands at the end of a long and complicated causal history. We might imagine a world where causal histories are short and simple; but in the world as we know it, the only question is whether they are infinite or merely enormous. (1986:214)

Since many essential elements of sociological explanations – such as legal rules, social institutions, and productive capacities – are the results of long and intricate historical processes, these sorts of elements must either be ignored and a world of short and simple causal histories be assumed, which to us seems unacceptable as a general rule, or they must be endogenized, which seems unrealistic given the current state of social theory. In contrast to areas such as moral philosophy and normative economic theory, where the strong individualistic program is essential, for an empirical science like sociology, state-of-nature stories appear to be of restricted use.

The weak version of methodological individualism agrees with the strong version in assuming that all social institutions in principle can be explained by only the intended and unintended consequences of individuals’ actions. But faced with a world consisting of causal histories of

¹³ For the sake of clarity, it should be noted that we also include ‘‘intentions’’ among the possible ‘‘causes’’ of individual action.

nearly infinite length, in practice we can only hope to provide information on their most recent history.¹⁴ The weak version of methodological individualism, therefore, is more apt in our view for the construction of explanatory theory. By taking certain macro-level states as given and incorporating them into the explanation, the realism and the precision of the proposed explanation is greatly improved. From what we have just said, it is also clear that the use of methodological individualism in sociology differs in one respect from the way in which it normally is used in, say, economics and psychology: The action being analyzed is always action by individuals that is oriented to the behavior of others.¹⁵

The primacy of the analytical

It also is important to recognize that mechanisms, in the natural as well as in the social sciences, usually are unobserved analytical constructs. Weinberg (1993) emphasizes the important role that unobserved analytical entities have played in physics. For example, the existence of both the electron and the neutrino were conjectured and their role in various physical processes were usefully theorized, long before they actually were observed. Similarly, the social sciences routinely postulate the existence of unobserved explanatory mechanisms. Assumptions of intentions, discounting, and preferences have proven to be extremely useful analytical devices even though they never have been observed. Mechanisms, as Gudmund Hernes so forcefully argues in Chapter 4, are analytical constructs that provide hypothetical links between observable events.

The key characteristic of an analytical approach is that it proceeds by first constructing an analytical model of the situation to be analyzed (an ‘‘ideal type’’). This theoretical model is in principle constructed in such a way that it includes only those elements believed to be essential for the problem at hand. The target of the theoretical analysis, then, is this model

¹⁴ Alfred Marshall ([1920] 1986:644), when discussing the use of abstract reasoning in economics, advanced a similar argument regarding the necessity of short chains of deductive reasoning.

¹⁵ See Weber’s well-known definition of sociology: ‘‘Sociology . . . is a science concerning itself with the interpretive understanding of social action and thereby with a causal explanation of its course and consequences. . . . Action is ‘social’ insofar as its subjective meaning takes account of the behavior of others and is thereby oriented in its course’’ (p. 4 in *Economy and Society: An Outline in Interpretive Sociology*. Trans. Ephraim Fischoff et al. Berkeley: University of California Press [1921–22] 1978).

and not the reality that the model is intended to explain. However, to the extent that the theoretical model has been constructed in such a way that it incorporates the essential elements of the concrete situation, the results of the theoretical analysis will also shed light on the real-world situation that the model is intended to explain. Or, as Schumpeter (1908:527-8) once put it, when the tailor is good, the coat will fit.

Much of current sociological theorizing appears to be guided by a disbelief in the value of analytical abstractions and by a corresponding belief in the possibility of providing theoretical accounts of what happens as it actually happens. No one would dispute the attractiveness of this position if it were possible to realize, but accounting for something "as it actually happens" is always problematic and is reminiscent of Ranke's by now outdated and naive historicist position that history always should be analyzed "wie es eigentlich gewesen" (Ranke [1824] 1885:vi). Simply describing all the events, microscopic and macroscopic, that take place in a room during one second would – if it were technically possible – take centuries, and this very fact is the main reason for the necessity of an analytical approach. Even in the most trivial description of a social situation, we are forced to be highly selective about which events to include and which events to exclude from the description; this choice, implicitly or explicitly, is guided by our prior belief about the essential elements of the situation. Thus even the most detailed descriptive accounts are always "models" of concrete social situations, and these descriptive models will always distort reality by accentuating certain aspects of the situation and by ignoring others. An important implication of this, as Hernes emphasizes in his chapter, is that the alternative to a specific model never can be no model at all but is always an alternative model. Or in Hernes's colorful language, "models are to social science what metaphors are to poetry – the very heart of the matter" (Hernes 1979:20).

The distinction between a complex social reality and an intentionally simplified analytical model of this reality seems to have been lost in many sociological discussions of social theory. The standard sociological critique of analytical theory focuses on the realism of its assumptions. Criticism of this sort – which basically entails pointing out that theories intentionally built upon empirically inaccurate or incomplete assumptions indeed are built upon empirically inaccurate or incomplete assumptions – appears somewhat redundant. Criticizing an analytical model for lack of realism is a common instance of the logical fallacy, which consists of

mistaking the abstract for the concrete – what Whitehead ([1925] 1948: 52) called "The Fallacy of Misplaced Concreteness." The choice between the infinitely many analytical models that can be used for describing and analyzing a given social situation can never be guided by their truth value, because all models by their very nature distort the reality they are intended to describe. The choice must instead be guided by how useful the various analytical models are likely to be for the purpose at hand.

The belief in explanations that provide accounts of what happens as it actually happens has pervaded the sociological literature for decades and has produced an abundance of detailed descriptive narratives but few explanatory mechanisms of any generality. It is through abstractions and analytical accentuation, however, that general mechanisms are made visible. But these abstractions also distort by their very nature the descriptive account of what actually happened, by accentuating certain aspects of the situation and by ignoring others. Francis Crick's characterization of the process through which good biological theories are arrived at is in our opinion equally valid for the social sciences: "To produce a really good biological theory one must try to see through the clutter produced by evolution to the basic mechanisms lying beneath them" (Crick 1989:138).

Variables versus social mechanisms

The widespread use and knowledge of survey analysis and the statistical techniques needed for analyzing such data have clearly improved the ability of sociologists to describe social conditions and to test sociological theories. But, as emphasized by Sørensen in Chapter 10, the increasing use of these techniques has also fostered the development of a variable-centered type of theorizing that only pays scant attention to explanatory mechanisms. Coleman (1986) aptly described this type of sociology as a form of "individualistic behaviorism." The guiding principle behind this type of theorizing – usually referred to as "causal-modeling" – is the notion that individual behavior can and should be explained by various individual and environmental "determinants," and the purpose of the analysis is to estimate the causal influence of the various variables representing these determinants.¹⁶

¹⁶ The affinity between behaviorism and structural equation modeling was also noted by O. D. Duncan himself: "In [structural equation] models that purport to explain the behavior of individual persons, the coefficients [of the structural equation] could well take the form

According to Coleman, this emphasis on “causal” explanations of behavior represented a considerable change from the type of explanatory account used in the earlier tradition of community studies: “One way of describing this change is to say that statistical association between variables has largely replaced meaningful connection between events as the basic tool of description and analysis” (Coleman 1986:1327–8). In the causal-modeling tradition, variables and not actors do the acting (Abbott 1992).¹⁷

The tension between a variable-centered causal approach to sociological theorizing and a generative view emphasizing the importance of social mechanisms came to the fore in an exchange between Robert Hauser and Raymond Boudon in the mid-1970s. The context of this exchange was a review by Hauser of Boudon’s (1974) book on education and inequality. In this book, Boudon developed a theoretical model that he hoped would make intelligible a number of apparent paradoxes reported by empirical research on social mobility. Hauser suggested numerous changes to Boudon’s model, but the main message of his article was a strong disbelief in the very idea that had motivated Boudon to write the book (i.e., that an important distinction should be made between statistical and theoretical models, and that theoretical models are needed to explain the results of an empirical analysis):

Boudon dismisses several standard representations of the mobility process as being “basically statistical.” I can only guess what this means – perhaps that they are rich in formal properties or that sampling distributions of their parameters are known. Neither of these properties strikes me as undesirable, and these models do have coherent and intuitively meaningful interpretations relative to the mobility process. (Hauser 1976:923)

of units of response per unit of stimulus strength; the structural equation is, in effect, a stimulus–response law” (Duncan 1975:162–3).

¹⁷ Throughout his career, Coleman was a strong proponent of a generative view of causality, and he often expressed serious doubts about the usefulness of the type of causal analysis referred to previously. In *Introduction to Mathematical Sociology*, he wrote: “Note, however, that there is nowhere the proposal simply to engage in curve fitting, without an underlying model which expresses a social process. If the data happen to fit a simple curve, this may provide an economical statement of the data, in terms of the one or two parameters of the distribution curve. But if there is no underlying model with a reasonable substantive interpretation, little has been gained by such curve fitting” (Coleman 1964:518).

Boudon responded by noting that descriptive models of the sort advocated by Hauser are undoubtedly useful for many purposes but that their usefulness for causal analysis is considerably more restricted than assumed by Hauser. According to Boudon, understanding normally is achieved not by the means of descriptive statistical models but through theoretical models that show the abstract *logic* of the process being analyzed. In order to understand this logic, Boudon argued, “we must go beyond the statistical relationships to explore the generative mechanism responsible for them” (Boudon 1976:117). As he expressed it in a different context,

Causal analysis does not explain the [statistical] chart. It simply summarizes it. *Understanding* a statistical structure means in many cases building a generating theory or model . . . that includes the observed empirical structure as one of its consequences. (Boudon 1979:51–2)

So where does this leave us? We do not wish to suggest that quantitative empirical research is of minor importance for the sociological enterprise. Quite the contrary: Quantitative research is essential both for descriptive purposes and for testing sociological theories. We do, however, believe that many sociologists have had all too much faith in statistical analysis as a tool for *generating* theories, and that the belief in an isomorphism between statistical and theoretical models, which appears to be an integral feature of the causal-modeling approach, has hampered the development of sociological theories built upon concrete explanatory mechanisms.

Over the last few years, one can discern a movement away from the “hard-core” position represented by Hauser. Nevertheless, the way in which quantitative sociologists still allocate their time and intellectual energy between statistical and theoretical modeling reveals a strong preference for description and testing of hypotheses formulated by others, and they rarely show any serious intellectual commitment to developing the theoretical foundation of the discipline themselves. As suggested by Stinchcombe (1993:27–8), sociologists in the multivariate modeling tradition still “make only rhetorical use of the language of mechanisms.”

Social mechanisms: Some selected examples

In order to concretize the idea of a general social mechanism underlying a range of different social phenomena, we will briefly examine three well-

known theories in sociology – the self-fulfilling prophecy (Robert Merton), network diffusion (James Coleman), and threshold-based behavior (Mark Granovetter) – and we will suggest that they all are founded upon the same basic *belief-formation mechanism*.

The self-fulfilling prophecy is one of the most famous of all mechanisms-based theories in sociology and was formulated in 1948 by Robert Merton in a seminal article (Merton [1948] 1968). The basic idea is that an initially false definition of a situation evokes behavior that eventually makes the false conception come true (Schelling discusses numerous examples of such processes in Chapter 2). The key example that Merton uses to illustrate his argument is a run on a bank. If a rumor of insolvency somehow gets started, some depositors will withdraw their savings. Their withdrawal will strengthen the belief in the rumor, partly because the withdrawals actually may hurt the financial standing of the bank, but more importantly because the act of withdrawal in itself signals to others that something indeed might be wrong with the bank. This produces even more withdrawals, which further reduces the trust in the bank, and so on. Because of the operation of this mechanism, even an initially sound bank may go bankrupt if enough depositors withdraw their money in the (initially) false belief that the bank is insolvent.

The study of network diffusion processes currently is a vigorous area of sociological research (cf. Burt 1987; Marsden and Podolny 1990; Strang and Tuma 1993; Hedström 1994b). To a considerable extent, this line of research has been inspired by Coleman, Katz, and Menzel's classic study of the diffusion of a new drug (see Coleman, Katz, and Menzel 1957 1966). Their main finding was that physicians' positions in various professional networks influenced the diffusion process, particularly during the period immediately after the new drug had been introduced on the market. Their explanation for this finding is reminiscent of Merton's argument about the self-fulfilling prophecy:

Why should these sociometric ties to colleagues who have used the drug be influential during the first months of the drug's availability, but not later? One possible answer lies in the greater uncertainty about the drug that must have prevailed when it was new. . . . We know from work in the tradition of Sherif that it is precisely in situations which are objectively unclear that social validation of judgments becomes most important. More generally, this explanation implies that a doctor will be

influenced more by what his colleagues say and do in uncertain situations, whenever and wherever they may occur, than in clear-cut situations. (Coleman, Katz, and Menzel 1957: 268–9)

The core of their argument is consequently that networks are important because information about innovations, in this case a new drug, diffuse through them, and that an individual's propensity to adopt the innovation is influenced by what others do, particularly when there is a great deal of uncertainty about the true value of the innovation.

Our final example is Granovetter's threshold theory of collective behavior (see Granovetter 1978; Granovetter and Soong 1983). Granovetter argued that an individual's decision whether or not to participate in collective behavior often depends in part on how many other actors already have decided to participate. He further argued that actors differ in terms of the number of other actors who already must participate before they decide to the same, and he introduced the concept of an individual's "threshold" to describe this individual heterogeneity. An actor's threshold denotes the proportion of the group which must have joined before the actor in question is willing to do so, and an important qualitative result of Granovetter's analysis was that even slight differences in thresholds can produce vastly different collective outcomes (see also Schelling 1978, for a similar analysis).

Granovetter gives a range of examples of threshold-based behavior, but the following example illustrates particularly well the logic behind this sort of conditional behavior:

Suppose you are in an unfamiliar town and enter an unknown restaurant on Saturday evening at seven o'clock. Whether or not you decide to take a meal there will depend in part on how many others have also decided to do so. If the place is nearly empty, it is probably a bad sign – without some minimal number of diners, one would probably try another place. (Granovetter 1978:1438–9)

The reason that the number of visitors at the restaurant is likely to influence an individual's choice of restaurant is that in situations of uncertainty, the number of diners constitute a signal about the likely quality of the restaurant, and this signal may be decisive for the individual's choice of action.

In order to more clearly see the logical structure of the arguments ad-

vanced by Merton, Coleman, and Granovetter, it is useful to adopt a slightly more formalized language. Let

P_{it} = propensity of individual i to perform the act being analyzed at time t (e.g., withdrawing savings from the bank, adopting a new drug, visiting a restaurant, or joining an organization for collective action), and

b_{it} = the strength of individual i 's belief in the value or necessity of performing the act in question at time t .

Merton, Coleman, and Granovetter all assume that individuals are goal directed and that an individual's propensity to perform the act being analyzed is an increasing function f of the individual's belief in the value of performing the act: $P_{it} = f(b_{it})$. However, the core mechanism that gives Merton's, Coleman's, and Granovetter's analyses their counterintuitive appeal, concerns the ways in which they assume that individuals' beliefs are being formed. More specifically, their proposed mechanism states that individual i 's belief in the value or necessity of performing the act is a function of the number of other individuals who performed the act at time $t - 1$. Merton's bank customers based their judgments about the solvency of the bank on the number of other customers withdrawing their savings from the bank; Coleman's physicians based their evaluations of the possible effect of the new drug on the doings of their colleagues; and Granovetter's restaurant visitor based his/her decision on the number of diners already in the restaurant. That is, they all assumed that

$$b_{it} = g(n_{t-1})$$

where n_{t-1} = number of individuals performing the act time $t - 1$, and g is an increasing function.

Inserting this expression into the former one, we arrive at $P_{it} = f[g(n_{t-1})]$, which suggests that an individual's propensity of withdrawing savings from the bank, adopting a new drug, visiting a restaurant, or joining an organization for collective action is an increasing function of the number of other individuals who already have performed the same act.

The main difference between the three theories considered here centers on the function g , which provides the fine-grained details of the link between b_{it} and n_{t-1} , and the details of this link will influence the aggregate

dynamics of the system.¹⁸ But the core characteristic of these theories that gives them their nonobvious character and appeal is the general *belief-formation mechanism* which states that the number of individuals who perform a certain act signal to others the likely value or necessity of the act, and this signal will influence other individuals' choice of action. It is this belief-formation mechanism that is at the heart of the self-fulfilling prophecies of Merton, the network effects of Coleman, and the bandwagon effects of Granovetter. On the fundamental level of mechanisms, the run on the bank, the prescription of the drug, and the emergence of the collective movement, all are analogous.¹⁹

Social mechanisms: A typology

As several authors in this book point out, explanations of most concrete social events or states require resort to several elementary mechanisms; one is not enough. Sometimes these mechanisms counteract one another, and sometimes they work together. In any case, the multiplicity of mechanisms makes it important to introduce some kind of typology that sorts them in a meaningful way. The one we shall present here takes its departure from James Coleman's (1986) well-known model for how to conceptualize collective social action, the so-called macro-micro-macro model. The three different types of social mechanisms in our typology are summarized in Figure 1.1.

The general thrust of this model is that proper explanations of change and variation at the macro level entails showing how macro states at one point in time influence the behavior of individual actors, and how these actions generate new macro states at a later time. That is, instead of analyzing relationships between phenomena exclusively on the macro level, one should always try to establish how macro-level events or conditions affect the individual (Step 1), how the individual assimilates the impact

¹⁸ Coleman assumed that g was a function of the sociometric ties, Granovetter assumed that it was a function of individual thresholds, and Merton left the functional form unspecified. When mechanisms are expressed in mathematical language, they appear as functions transforming variables. These functions can be distinguished from one another on the basis of their functional form and their parameter values. See Hernes (1976).

¹⁹ In addition to this belief-formation mechanism, there are, of course, other action and transformation mechanisms that are involved in Merton's, Coleman's, and Granovetter's analyses, but these mechanisms are commonplace and tangential to the core processes they analyze. See Hedström's Chapter 12 in this volume for a more detailed analysis of this type of mechanism.

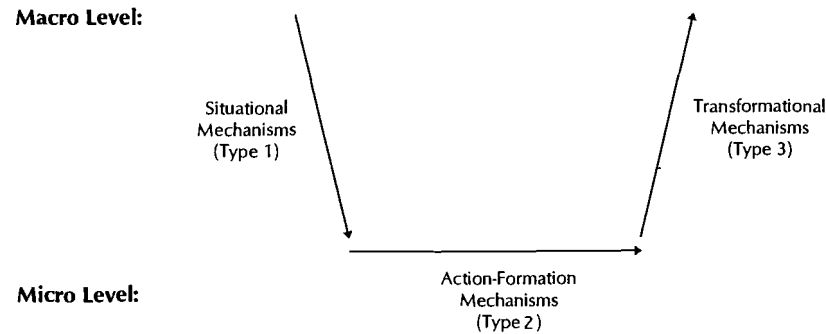


Figure 1.1. A typology of social mechanisms.

of these macro-level events (Step 2), and how a number of individuals, through their actions and interactions, generate macro-level outcomes (Step 3). This way of conceptualizing social action lends itself in a very natural way to a typology of mechanisms: macro-micro mechanisms, micro-micro mechanisms, and micro-macro mechanisms – and a few words will be said about each of these.²⁰

The actor in the first two types of situations is a single individual, and the mechanism is internal (and in this sense “psychological” or “social-psychological”); in the third type, there are a number of actors, and the mechanism is typically external (and “social”). The following description of what a mechanism is (by Diego Gambetta in Chapter 5 of this book) captures the essence of the first two types of mechanisms, which focus on single pieces of behavior: “[Mechanisms are] hypothetical causal models which make sense of *individual* behavior [and] have the form ‘given certain conditions *K*, an agent will do *x* because of [mechanism] *M* with probability *p*.’” Stinchcombe’s earlier cited definition of mechanisms as mediating between lower and higher levels, however, focuses more directly on social interaction and on the consequences of social action. This is also true for Thomas Schelling’s definition (in Chapter 2): “A social

²⁰ The logic of Coleman’s argument also suggests that any kind of continuous social action can be conceptualized as a long chain of successive macro-micro-macro transformations, where, in many cases, only the peaks, so to speak (“macro-macro”), are visible to the researcher – but where the analytical point is precisely to explain this cumulative social action as a result of a large number of macro-micro-macro transitions.

mechanism is a plausible hypothesis, or set of plausible hypotheses, that could be the explanation of some social phenomena, the explanation being in terms of interactions between individuals, or individuals and some social aggregate.”

The first of the three types of mechanisms covers the macro-to-micro transition, in Coleman’s terminology, and following a suggestion of Stinchcombe (1993), we shall call it a *situational mechanism*. The individual actor is exposed to a specific social situation, and this situation will affect him or her in a particular way. Erving Goffman’s (1963) work on behavior in public places and Karl Popper’s form of situational analysis (cf. Popper, 1994) have these sorts of mechanisms at their core. The belief-formation mechanism discussed previously, opportunity-generating mechanisms such as White’s (1970) vacancy chains, and preference-formation mechanisms such as those expressed in the idea of reference groups (see Merton and Rossi 1968; Boudon 1988) are prototypical examples of general social mechanisms that in a systematic and reasonably precise way link a social structure or other macro-sociological event or states to the beliefs, desires, and opportunities of some individual actor.

The second type of mechanism is to be located at the micro level, and we refer to it as an *action-formation mechanism*. This type of mechanism shows how a specific combination of individual desires, beliefs, and action opportunities generate a specific action. A plurality of psychological and social-psychological mechanisms operate at this level. General decision theories as well as more specific theories such as Leon Festinger’s (1957) theory of cognitive dissonance and George Ainslie’s (1992) on discounting illustrate different types of action mechanisms.

The third type of mechanism covers the micro-to-macro transition, and we propose to call it a *transformational mechanism*. Here a number of individuals interact with one another, and the specific mechanism (which differs depending on the nature of the interaction) shows how these individual actions are transformed into some kind of collective outcome, be it intended or unintended. Several of the theories mentioned elsewhere in this book – Schelling’s tipping model, standard game-theoretic models such as the tragedy of the commons, and neoclassical market models – are examples of transformational mechanisms.

Brief summary

We have argued that the notion of social mechanism is essential to social theory in general and to sociological theory in particular, and it is now time to conclude with a more formal definition of a social mechanism. The mechanism approach, as we see it, can be characterized by the following four core principles:

1. Action
2. Precision
3. Abstraction
4. Reduction

The first of these principles – explanations based on *actions* – means, among other things, that it is actors and not variables who do the acting. A mechanism-based explanation is not built upon mere associations between variables but always refers directly to causes and consequences of individual action oriented to the behavior of others. A corollary to this principle states that there exist no such things as “macro-level mechanisms”; macro-level entities or events are always linked to one another via combinations of situational mechanisms, action-formation mechanisms, and transformational mechanisms (i.e., all macro-level change should be conceptualized in terms of three separate transitions: macro-micro, micro-micro, and micro-macro).²¹

The second principle – explanatory *precision* – captures the essence of middle-range sociology and expresses the idea that sociology should not prematurely take on broad-sweeping and vague topics or try to establish universal social laws (which are unlikely to exist in any case). It should instead aim at explanations specifically tailored to a limited range of phenomena. This limited range is not synonymous with some small area of society; the same mechanism can often be found in many places in society.

The third principle – *abstraction* – expresses the idea that effective theorizing is not possible without a prompt elimination of irrelevant factors and a sharp focus on the central issue. Whereas this process is well un-

²¹ In addition to these basic characteristics of social mechanisms, the ideal mechanism, it seems to us, should also be simple and nonobvious.

derstood in economics, it is much less so in sociology. It is through abstraction and analytical accentuation that general social mechanisms are made visible.

The last of the four principles that characterize the mechanism approach – what we call *reduction* – is equivalent to the general reductionist strategy in science of opening up black boxes, and always striving for narrowing the gap or lag between input and output, cause and effect. A mechanism-based explanation seeks to provide a fine-grained as well as tight coupling between *explanans* and *explanandum*.

A general social mechanism can now be defined in the following way:

A social mechanism is an integral part of an explanation which (1) adheres to the four core principles stated previously, and (2) is such that on the occurrence of the cause or input, *I*, it generates the effect or outcome, *O*.

But even if definitions like this may be useful, it deserves to be pointed out that the essence of the mechanisms approach is to be found in a special *style of theorizing* rather than in any specific definition of what a social mechanism is. This style can be roughly characterized by a focus on middle-range puzzles or paradoxes for which precise, action-based, abstract, and fine-grained explanations are sought.

Brief overview of the book

The remaining chapters in this book roughly fall into three categories. First, a few general chapters discuss the defining characteristics and advantages of a mechanisms-based approach in the social sciences. Thomas Schelling explains with characteristic elegance and clarity how social mechanisms operate and how they can be used to explain different types of social dynamics (Chapter 2). The emphasis in the two following chapters in this section is somewhat different. Jon Elster notes that mechanisms abound in the works of Montaigne, Tocqueville, and in proverbs (Chapter 3). He also argues that social mechanisms are characterized by the fact that they are easily recognizable causal patterns that are triggered under generally unknown conditions. In this respect, they differ from laws, which state that given certain initial conditions, an event of one type (the cause) will always produce an event of another type (the effect). Gudmund Hernes addresses the same problematique as Elster but sug-

gests an alternative way of approaching it (Chapter 4). A social mechanism, according to Hernes, is perfectly general because mechanisms belong to the realm of the abstract. However, mechanisms can be of limited applicability, Hernes argues, if they describe few real-life processes realistically.

The second category essays are more specific in nature yet still of a general character. Diego Gambetta, for example, uses some empirical research to illustrate the point that social mechanisms often operate together in specific concatenations (Chapter 5). Tyler Cowen looks at economics and argues that it is a science of social mechanisms. He pays particular attention to the problem of indeterminacy that arises when multiple equilibria exist (Chapter 6). Timur Kuran, an economist as Cowen, discusses mechanisms involved in preference falsification and also points to a number of mechanisms that can come into play when an actor has contradictory values (Chapter 7). Raymond Boudon argues that in a rational-choice type of analysis, all black boxes can in principle be eliminated and all mechanisms laid bare – but only if the analysis is broadened to include normative beliefs (Chapter 8). One of the examples that Boudon uses to illustrate his argument comes from Tocqueville, one of the most explicitly mechanisms-oriented classics of the social sciences.

The third category essays are all written by sociologists and either deal with specific sociological problems or attempt to survey the current state of sociology. Axel van den Berg analyzes a number of so-called general theories – as can be found in the works of Jeffrey Alexander, Pierre Bourdieu, Anthony Giddens, and Jürgen Habermas – and argues that all of them are marred by their lack of precision and their unsystematic attention to the role of social mechanisms in explaining concrete social phenomena (Chapter 9). Aage Sørensen criticizes a different tendency in today's sociology – the obsession with statistical models and the neglect of the need to develop sociological models mirroring the social mechanisms and their role in social change (Chapter 10). Arthur Stinchcombe analyzes three different categories of actors – elite universities, enterprises, and nation states – and shows how they all exemplify the workings of one and the same mechanism: monopolistic competition (Chapter 11). Finally, Peter Hedström examines social mechanisms of imitative behavior, paying particular attention to the role of rational bases of imitative behavior (Chapter 12).

References

- Abbott, A. 1992. What Do Cases Do? Some Notes on Activity in Sociological Analysis. Pp. 53–82 in C. C. Ragin and H. S. Becker (eds.), *What is a Case? Exploring the Foundations of Social Inquiry*. Cambridge: Cambridge University Press.
- Ainslie, G. 1992. *Picoeconomics: The Strategic Interaction of Successive Motivational States within the Person*. Cambridge: Cambridge University Press.
- Alexander, J. C. 1988. The New Theoretical Movement. Pp. 77–102 in N. Smelser (ed.), *Handbook of Sociology*. London: SAGE.
- Beckner, M. O. 1967. Mechanism in Biology. Pp. 250–2 in Vol. 5 of P. Edwards (ed.), *The Encyclopaedia of Philosophy*. New York: Macmillan and The Free Press.
- Bennett, W. R. Jr. 1994. *Health and Low-Frequency Electromagnetic Fields*. New Haven: Yale University Press.
- Bhaskar, R. 1978. *A Realist Theory of Science*. Sussex: The Harvester Press.
- Boudon, R. 1974. *Education, Opportunity, and Social Inequality*. New York: Wiley.
- Boudon, R. 1976. Comment on Hauser's Review of *Education, Opportunity, and Social Inequality*. *American Journal of Sociology* 81: 1175–87.
- Boudon, R. 1979. Generating Models as a Research Strategy. Pp. 51–64 in R. K. Merton, J. S. Coleman, and P. H. Rossi (eds.), *Qualitative and Quantitative Social Research: Papers in Honor of Paul F. Lazarsfeld*. New York: The Free Press.
- Boudon, R. 1988. The Logic of Relative Frustration. Pp. 245–67 in M. Taylor (ed.), *Rationality and Revolution*. Cambridge: Cambridge University Press.
- Boudon, R. 1991. What Middle-Range Theories Are. *Contemporary Sociology* 20: 519–22.
- Bower, G. H. 1975. Cognitive Psychology: An Introduction. Pp. 25–80 in W. K. Estes (ed.), *Handbook of Learning and Cognitive Processes*. New York: Wiley.
- Bunge, M. 1967. *Scientific Research*. Volume 3 in *Studies of the Foundations, Methodology, and Philosophy of Science*. Berlin: Springer-Verlag.
- Burt, R. S. 1987. Social Contagion and Innovation: Cohesion versus Structural Equivalence. *American Journal of Sociology* 92:1287–1335.
- Coleman, J. S. 1964. *Introduction to Mathematical Sociology*. New York: The Free Press.
- Coleman, J. S. 1986. Social Theory, Social Research, and a Theory of Action. *American Journal of Sociology* 91:1309–35.
- Coleman, J. S. 1990. *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.
- Coleman, J. S., E. Katz, and H. Menzel. 1957. The Diffusion of an Innovation among Physicians. *Sociometry* XX:253–70.

- Coleman, J. S., Elihu Katz, and Herbert Menzel. 1966. *Medical Innovation*. Indianapolis: Bobbs-Merrill.
- Crick, F. 1989. *What Mad Pursuit: A Personal View of Scientific Discovery*. London: Penguin Books.
- Dijksterhuis, E. J. 1986. *The Mechanization of the World Picture: Pythagoras to Newton*. Princeton: Princeton University Press.
- Doll, R., and R. Peto. 1981. *The Causes of Cancer*. Oxford: Oxford University Press.
- Duncan, O. D. 1975. *Introduction to Structural Equation Models*. New York: Academic Press.
- Elster, J. 1983. *Explaining Technical Change: A Case Study in the Philosophy of Science*. Cambridge: Cambridge University Press.
- Elster, J. 1989. *Nuts and Bolts for the Social Sciences*. Cambridge: Cambridge University Press.
- Elster, J. 1991. Patterns of Causal Analysis in Tocqueville's *Democracy in America*. *Rationality and Society* 3(3):277-97.
- Elster, J. 1992. *Local Justice: How Institutions Allocate Scarce Goods and Necessary Burdens*. New York: Russell Sage Foundation.
- Elster, J. 1993. *Political Psychology*. Cambridge: Cambridge University Press.
- Festinger, L. 1957. *A Theory of Cognitive Dissonance*. Stanford: Stanford University Press.
- Feychting, M., and A. Ahlbom. 1993. Magnetic Fields and Cancer in Children Residing Near Swedish High-voltage Power Lines. *American Journal of Epidemiology* 138:467-81.
- Ghins, M. 1990. Mécanisme. Pp. 1582-3 in S. Aurox (ed.), *Les Notions Philosophiques - Dictionnaire*. Paris: Presses Universitaires de France.
- Giddens, A. 1987. *Social Theory and Modern Sociology*. Stanford: Stanford University Press.
- Gladwell, M. 1996. The Tipping Point. *New Yorker* June 3:32-8.
- Goffman, E. 1963. *Behavior in Public Places: Notes on the Organization of Gatherings*. New York: The Free Press.
- Goldthorpe, J. H. 1996. The Quantitative Analysis of Large-scale Data Sets and Rational Action Theory. *European Sociological Review* 12:109-26.
- Granovetter, M. 1978. Threshold Models of Collective Behavior. *American Journal of Sociology* 83:1420-43.
- Granovetter, M. 1982. Review of Christopher Jencks et al., *Who Gets Ahead? The Determinants of Economic Success in America*. *Theory and Society* 11:257-62.
- Granovetter, M., and R. Soong. 1983. Threshold Models of Diffusion and Collective Behavior. *Journal of Mathematical Sociology* 9:165-79.
- Hamlin, C. 1990. *A Science of Impurity: Water Analysis in Nineteenth Century Britain*. Bristol: Adam Hilger.
- Harré, R. 1970. *The Principles of Scientific Thinking*. Chicago: University of Chicago Press.
- Harré, R. 1984. *The Philosophies of Science*. 2nd ed. Oxford: Oxford University Press.
- Hauser, R. M. 1976. Review Essay: On Boudon's Model of Social Mobility. *American Journal of Sociology* 81:911-28.
- Hedström, P. 1994a. Magnetic Fields and Cancer Risks: Should Recent Epidemiological Results be a Cause of Concern? *Occasional Paper Series*. Department of Sociology, Stockholm University.
- Hedström, P. 1994b. Contagious Collectivities: On the Spatial Diffusion of Swedish Trade Unions, 1890-1940. *American Journal of Sociology* 99:1157-79.
- Hedström, P. Forthcoming. Rational Choice and Social Structure: On Rational-Choice Theorizing in Sociology. In B. Wittrock (ed.), *Social Theory and Human Agency*. London: Sage.
- Hedström, P., and R. Swedberg. 1996a. Rational Choice, Empirical Research, and the Sociological Tradition. *European Sociological Review* 12:127-46.
- Hedström, P., and R. Swedberg. 1996b. Social Mechanisms. *Acta Sociologica* 39:281-308.
- Hempel, C. G. 1942. The Function of General Laws in History. *Journal of Philosophy* 39: 35-48.
- Hempel, C. G. 1962. Explanation in Science and in History. Pp. 9-33 in R. G. Colodny (ed.), *Frontiers of Science and Philosophy*. Pittsburgh: University of Pittsburgh Press.
- Hernes, G. 1976. Structural Change in Social Processes. *American Journal of Sociology* 82:513-47.
- Hernes, G. 1979. Om bruk av Økonomiske Modeller i sosiologien. *Sosiologi i Dag* 4:19-39.
- Hirschman, A. O. 1970. *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*. Cambridge, MA: Harvard University Press.
- Homans, G. C. 1961. *Social Behaviour: Its Elementary Forms*. London: Routledge & Kegan Paul.
- Humphreys, P. 1991. Review of Jon Elster, *Nuts and Bolts for the Social Sciences*. *Philosophy of the Social Sciences*, 21(March):114-21.
- Kalleberg, A., and I. Berg. 1987. *Work and Industry: Structures, Markets, and Processes*. New York: Praeger.
- Karlsson, G. 1958. *Social Mechanisms: Studies in Sociological Theory*. Stockholm: Almqvist & Wicksell.
- Kiser, E., and M. Hechter. 1991. The Role of General Theory in Comparative-historical Sociology. *American Journal of Sociology* 97:1-30.
- Lazarsfeld, P., B. Berelson, and H. Gaudel. 1944. *The People's Choice*. New York: Columbia University Press.
- Lewis, D. 1986. *Philosophical Papers*, ii. Oxford: Oxford University Press.
- Liebertson, S. 1985. *Making it Count: The Improvement of Social Research and Theory*. Berkeley: University of California Press.
- Lundberg, G. A. 1939. *Foundations of Sociology*. New York: Macmillan.
- Marsden, P. V., and J. Podolny. 1990. Dynamic Analysis of Network Diffusion

- Processes. Pp. 197–214 in H. Flap and J. Weesie (eds.), *Social Networks through Time*. Utrecht: ISOR.
- Marshall, A. [1920] 1986. *Principles of Economics*. 8th ed. London: Macmillan.
- Merton, R. K. 1948. Discussion [of Talcott Parsons, "The Position of Sociological Theory"]. *American Sociological Review* 13:164–8.
- Merton, R. K. [1948] 1968. The Self-fulfilling Prophecy. Pp. 475–90 in *Social Theory and Social Structure*. New York: The Free Press.
- Merton, R. K. 1967. On Sociological Theories of the Middle Range. Pp. 39–72 in *On Theoretical Sociology*. New York: The Free Press.
- Merton, R. K. 1984. Socially Expected Durations: A Case Study of Concept Formation in Sociology. Pp. 262–83 in W. W. Powell and R. Robbins (eds.), *Conflict and Consensus*. New York: The Free Press.
- Merton, R. K., and A. S. Rossi. 1968. Contributions to the Theory of Reference Group Behavior. Pp. 279–334 in *Social Theory and Social Structure*. New York: The Free Press.
- ORAU. 1992. *Health Effects of Low-Frequency Electric and Magnetic Fields*. Oak Ridge Associated Universities Panel. Washington, D.C.: U.S. Government Printing Office.
- Oxford English Dictionary. 1989. Mechanism. Pp. 536–7 in vol. IX. Oxford: Clarendon Press.
- Parsons, T. 1951. *The Social System*. New York: The Free Press.
- Parsons, T., and E. Shils (eds.). 1951. *Toward A General Theory of Action*. Cambridge: Harvard University Press.
- Pawson, R. 1989. *A Measure for Measures: A Manifesto for Empirical Sociology*. London: Routledge.
- Popper, K. R. 1994. Models, Instruments, and Truth: The Status of the Rationality Principle in the Social Sciences. Pp. 154–84 in K. R. Popper, *The Myth of the Framework: In Defence of Science and Rationality*. London: Routledge.
- Ranke, von. L. [1824] 1855. *Geschichten der romanischen und germanischen Völker von 1494 bis 1514*. 3rd ed. Munich: Duncker & Humblot.
- Sayer, A. 1984. *Method in Social Science*. London: Hutchinson.
- Schelling, T. C. 1978. *Micromotives and Macrobehavior*. New York: W. W. Norton.
- Schumpeter, J. 1908. *Das Wesen und der Hauptinhalt der theoretischen Nationalökonomie*. Munich: Duncker & Humblot.
- Schumpeter, J. A. 1989. *Essays on Entrepreneurs, Innovations, Business Cycles, and the Evolution of Capitalism*. New Brunswick: Transaction Publishers.
- Small, A. 1905. *General Sociology: An Exposition of the Main Development in Sociological Theory from Spencer to Ratzenhofer*. Chicago: University of Chicago Press.
- Sørensen, A. B. 1990. Interview. Pp. 303–15 in R. Swedberg, *Economics and Sociology*. Princeton: Princeton University Press.
- Stinchcombe, A. L. 1968. *Constructing Social Theories*. Chicago: University of Chicago Press.

- Stinchcombe, A. L. 1991. The Conditions of Fruitfulness of Theorizing about Mechanisms in Social Science. *Philosophy of the Social Sciences* 21(3):367–88. (See also Stinchcombe 1993).
- Stinchcombe, A. L. 1993. The Conditions of Fruitfulness of Theorizing about Mechanisms in Social Science. Pp. 23–41 in A. Sørensen and S. Spilerman (eds.), *Social Theory and Social Policy: Essays in Honor of James S. Coleman*. Westport, CT: Praeger. (This paper is identical, save for a few items, to Stinchcombe 1991).
- Strang, D., and N. Brandon Tuma. 1993. Spatial and Temporal Heterogeneity in Diffusion. *American Journal of Sociology* 99:614–39.
- Suppes, P. 1970. *A Probabilistic Theory of Causality*. Acta Philosophica Fennica, Fasc. XXIV. Amsterdam: North-Holland.
- Swedberg, R. 1996. Analyzing the Economy: On the Contribution of James S. Coleman. Pp. 313–28 in J. Clark (ed.), *James S. Coleman*. London: The Falmer Press.
- Swedberg, R. Forthcoming. *Max Weber and the Idea of Economic Sociology*. Princeton: Princeton University Press.
- Therborn, G. 1991. Cultural Belonging, Structural Location and Human Action: Explanation in Sociology and in Social Science. *Acta Sociologica* 34:177–91.
- Townsend, P., and N. Davidson. 1982. *Inequalities in Health: The Black Report*. Baltimore: Penguin Books.
- Udehn, L. 1987. *Methodological Individualism*. Ph.D. diss. Uppsala: Dept. of Sociology, Uppsala University.
- von Wright, G. H. 1971. *Explanation and Understanding*. Ithaca: Cornell University Press.
- Weber, Marianne. 1975. *Max Weber: A Biography*. Trans. Harry Zohn. New York: Wiley.
- Weber, Max. [1921–2] 1978. *Economy and Society: An Outline of Interpretive Sociology*. Ed. G. Roth and C. Wittich. Trans. Ephraim Fischhoff et al. 2 vols. Berkeley: University of California Press.
- Weber, M. 1946. *From Max Weber: Essays in Sociology*. Trans. and ed. H. Gerth and C. Wright Mills. New York: Oxford University Press.
- Weber, Max. 1949. *The Methodology of the Social Sciences*. Trans. and ed. E. A. Shils and H. A. Finch. New York: The Free Press.
- Weinberg, S. 1993. *Dreams of a Final Theory: The Search for the Fundamental Laws of Nature*. London: Vintage.
- White, H. C. 1970. *Chains of Opportunity: System Models of Mobility in Organizations*. Cambridge: Harvard University Press.
- Whitehead, A. N. [1925] 1948. *Science and the Modern World: Lowell Lectures, 1925*. New York: New American Library.