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## **Micro-Macro Transitions in Rational Choice Explanations**

*Abstract:* The rational choice approach focuses on explaining macrosocial phenomena or relationships by applying a theory about the behavior of individual actors. This paper addresses James S. Coleman's account of micro-macro transitions involved in rational choice explanations. The starting point of this account is a macro-relationship. Its independent variable has a causal effect on the independent variable of a micro-relationship. The dependent variable of this relationship in turn influences the dependent variable of the macro-relationship (see Figure 1 of this paper). The paper extends this account by delineating other types of micro-macro explanations and discusses some of its problems.

A recurring problem of applying rational choice theory to explain collective phenomena like revolutions, economic growth and crime rates is the transition from the level of individual actors to the macro-level. Like many others before him, Coleman (1990, chapter 1 - all quotations refer to this chapter, unless indicated otherwise) addresses himself to this issue too.<sup>1</sup> In this paper I will first describe Coleman's account of micro-macro transitions in rational choice explanations. I will then extend Coleman's schema and discuss some of its problems.

### **1. The Methodology of 'Internal Analysis of Systems Behavior'**

Coleman claims that the focus of the social sciences be the social system, i.e., some aggregate of individual actors. A social system "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 individual or other components which make it up" (2). Coleman himself focuses on "processes internal to the system, involving its component parts, or units at a level below that of the system" (2).<sup>2</sup>

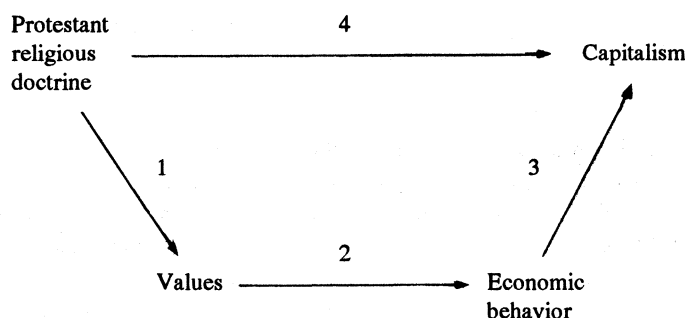
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<sup>1</sup> For the relationship between a micro-theory like the rational choice model and sociological hypotheses see, e.g., Hummell/Opp 1971; Opp 1979; 1988; Wippler/Lindenberg 1987. For a general discussion see Alexander et al. 1987.

<sup>2</sup> It is not clear how exactly Coleman demarcates statements referring to individuals and to social systems. According to his 1987 paper a statement about suicide rates -

To illustrate, in one of his examples Coleman reconstructs Max Weber's famous hypothesis claiming that the Protestant religious doctrine led to the advent of capitalist economic organization.<sup>3</sup> This hypothesis refers to the system level - see arrow 4 in figure 1 (adapted from p. 8), since a religious doctrine and a capitalist organization are properties of a social system and not of an individual actor. The next step in Weber's explanatory argument refers to the question of why this relationship holds. Weber examines the content of the Calvinist doctrine and finds that it imposes some moral prescriptions on its adherents like diligence in performing one's duty and anti-traditionalism (arrow 1 in figure 1). These moral values lead to specific kinds of economic behavior (arrow 2 in figure 1). This is a micro-level hypothesis since 'values' and 'economic behavior' characterize individual actors. 'Economic behavior' brings about a capitalist economic organization (arrow 3 in figure 1).

Figure 1  
Religious Doctrine and Economic Organization



Coleman's scheme provides an *explanation of a macro-relation*: The example addresses the question of why a Protestant religious doctrine led to a capitalist economic order. The variables of the macro-relation are causally linked to the

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Coleman refers to Durkheim's work - is about individuals. A real macrosocial property refers to "society as a whole" (155), "...the phenomenon to be explained involves social organization, not merely aggregated individual behavior" (157), "... the appropriate transition cannot involve the simple aggregation of individual behavior" (157). In some of his examples, however, properties constructed by 'simple aggregation' are regarded as macrosocial properties like 'run to exit' (micro-level) and 'panic' (macro-level): It seems that a 'panic' refers to a number of persons running to an exit. See also p. 165 where 'inequality of income' is treated as a macrosocial property. We neither see any need nor possibility for a clear distinction between properties resulting from 'simple aggregation' and 'real' macrosocial properties. We define any concept or statement referring to an aggregate of individual actors as 'macrosocial', including 'simple aggregation'.

<sup>3</sup> Coleman's book and Coleman 1987 include other examples. For another interesting example using Coleman's scheme see Podes 1991.

variables of a hypothesis referring to the micro-level. In Coleman's book as well as in the present paper the microsocial proposition is the rational actor model.

Coleman notes several problems of this example: (1) How does the economic behavior bring about a capitalist organization? (2) Whose economic behavior is relevant for the emergence of capitalism - "that of prospective workers in capitalist enterprise, that of prospective entrepreneurs, or that of both?" (3) Are values sufficient to create the economic behavior of each of those groups that brings about a capitalist order?

## 2. Extensions and Problems

Is the scheme depicted in figure 1 an appropriate account for all rational choice explanations? In this section I will discuss several modifications and problems of this scheme.

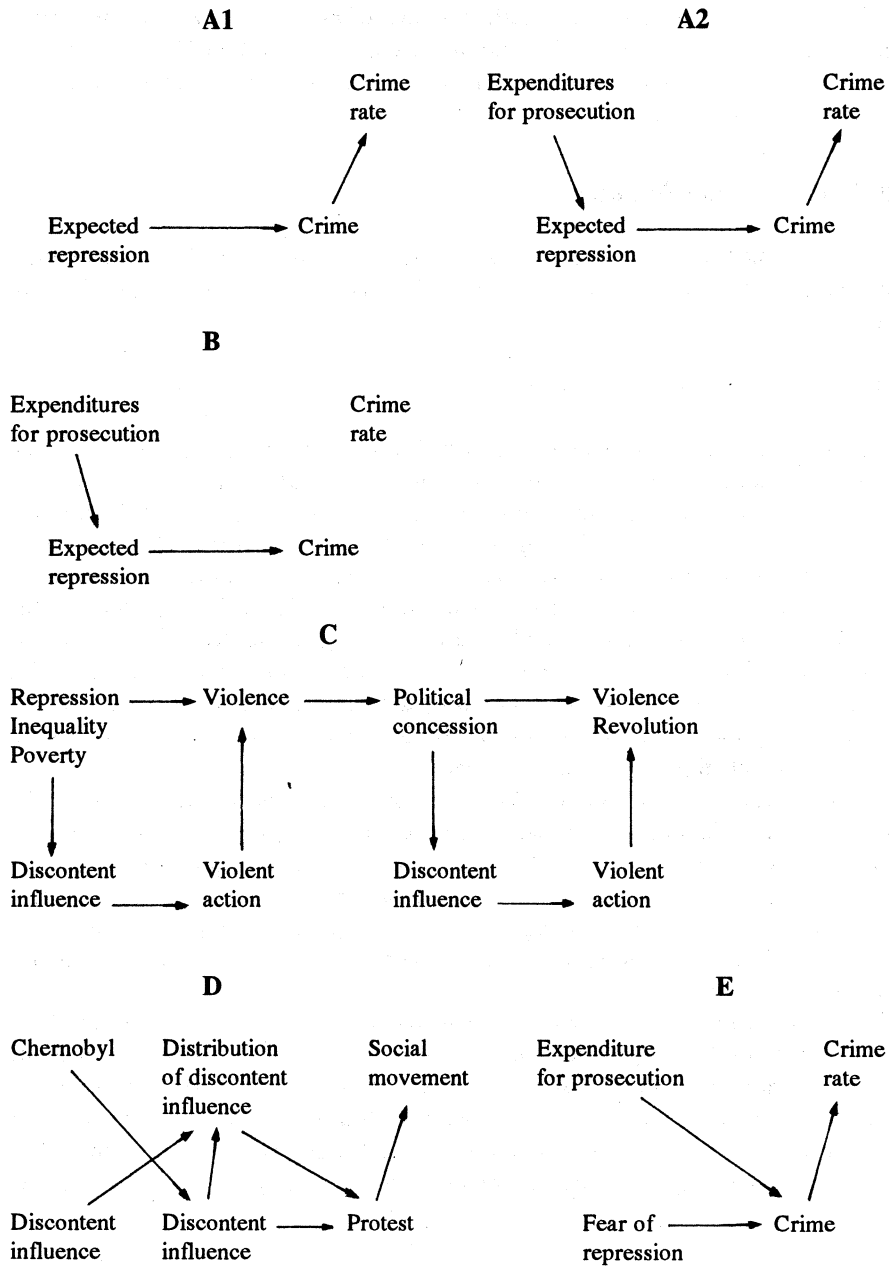
### A. Explaining Macro-Phenomena

Coleman himself mentions one "exception" to his schema: The problem is often not to explain a macro-*relation* but some macro-level *phenomenon* (20). Assume we want to explain why the crime rate of East Germany increased after the breakdown of the communist regime in 1989. Assume further that the major incentive of committing a crime is (the subjective probability and costs of) repression. This is a micro-relation like arrow 2 of figure 1. Accordingly, the rise of the crime rate may be explained by pointing to the decrease of expected repression after 1989 which prompted individuals to commit more crimes. The transition to the macro-level is achieved by a simple aggregation: The crime rate is defined by the number of crimes for 100.000 inhabitants. Panel A1 in figure 2 (p. 146) depicts this theoretical argument.

Coleman does not give any reason why an explanation of this sort should be ruled out as a legitimate rational choice explanation. First, explaining macro-phenomena by looking at the individual incentives is a formally correct explanation. Second, it is an informative explanation and relevant for practical purposes. For example, a researcher finding a response rate (a macro-property) in a survey of only 40% will want to know something about the reasons why individuals refused to be interviewed.

An explanation like A1 may be expanded by a macro-variable to meet Coleman's criterion and thus becomes a 'full-fledged' micro-macro explanation: Many social scientists may want to know why expected repression decreased. An answer to this question may be that the expenditures for prosecution have been drastically reduced (see panel A2 in figure 2): Actually East Germany came close to an anarchic state after the fall of the communist regime. To be sure, this

Figure 2  
Variants of Micro-Macro Transitions



explanation provides more information than A1, but if we would discard any explanation for which a more informative explanation exists, explanations like A2 must be dismissed too: Why, for example, were the expenditures for prosecution reduced? We therefore conclude that explanations of type A1 are a legitimate and useful type of rational choice explanations.

### *B. Explaining Individual Effects of Macro-Phenomena*

Will people commit fewer crimes if the expenditures for prosecuting crimes are increased? This question refers to the effects of a macro-variable: Expenditures are a property of a political actor like a department of justice or a police department. The effects refer to properties of individual actors.

How can such questions be answered? In rational choice explanations macro-variables have never direct, but only indirect effects on action. Macro-variables change action via incentives, as panel A2 in figure 2 illustrates.

An answer to the question might be that increasing expenditures for prosecuting crimes increase expected repression of individual actors which in turn deters people from committing crimes. This example requires another modification of the initial scheme of figure 1: Only the independent macro-variable is left which has an effect on the independent micro-variable - see panel B of figure 2. The aggregation from the micro- to the macro-level is omitted.

Coleman does not mention this type of explanation. But his general account of appropriate rational choice explanations rules this explanation out since transition 3 (figure 1) is lacking. However, questions on the effects of the behavior of collective actors on the behavior of individual actors are often asked by politicians as well as by social scientists. We do not see any reason to dismiss this explanation and therefore regard it as another type of legitimate and useful rational choice explanation.

### *C. Complex Causal Structures*

The previous examples are extremely simple in at least one respect: The macro-social propositions are made up of only one independent and one dependent variable. Causal models focusing on macro-variables involve much more complicated causal structures. Is the scheme developed by Coleman applicable to such complex situations?

Let us look at an example. A macro-proposition explaining the amount of political violence in a society may include inequality, regime repression, and level of economic development (poverty) as independent variables (see, e.g., Muller 1985). A multi-level causal macro-model may extend this proposition - see panel C of figure 2: The three independent variables at time 1 affect violence at time 2 which leads to concessions of the government at time 3. This in turn

instigates more violent political action and revolutionary changes (i.e. the overthrow of the incumbent regime and a change of the political and social order).

How could a rational choice explanation of this macro-model look like? The three independent macro-variables - repression, inequality, and poverty - could increase political discontent and perceived political influence. The latter may occur because a high level of the three macro-variables prompts people to think that the government could no longer refrain from introducing some political changes and that violent political actions could help to accelerate this process. An increasing rate of violent political action in the society might lead to concessions of the government which again increase political discontent (rising expectations) and perceived influence. These increasing incentives may further raise political violence which ultimately leads to revolutionary changes (for a similar argument see Muller/Weede 1990).

This example suggests that Coleman's basic scheme can be used even if rational choice explanations of macro-relations or macro-properties become quite complicated. The movements between the micro- and macro-level may occur several times and the micro-model becomes a multi-level causal model too.

#### *D. Distributions of Incentives*

Micro-level hypotheses refer to single actors and their preferences and constraints. However, in many rational choice explanations the respective actions are dependent on *distributions* of incentives. An example may illustrate this - see panel D of figure 2. Assume the nuclear accident in Chernobyl increased political discontent with nuclear energy and the perceived influence that now protests could help to change government policy regarding the utilization of nuclear energy. Assume further that discontent and perceived influence have a positive (interaction) effect on participation in protest actions. A third assumption refers to a ceiling effect: If your discontent was already very high before Chernobyl, its increase due to a critical accident like Chernobyl is only small.

Participation in protests against nuclear energy depends, among other things, on the distribution of discontent in a population. Assume the x-axis represents the amount of discontent, with 'high' discontent on the right-hand side of the x-axis. The y-axis symbolizes frequencies. A distribution resembling a J means that discontent of most citizens is very high. Due to the above assumptions a nuclear accident would lead to fewer protests if a distribution resembling a J obtains than, say, a distribution resembling a reversed J saying that most people were satisfied. In this latter situation discontent would rise tremendously (for details see Opp 1991) after a nuclear accident. This example suggests that in general the distribution of incentives is of pivotal importance for the behavior of individual actors.

A distribution cannot be ascribed to a single individual but only to a *group* of individual actors. Thus, distributions are macro-level properties which are con-

structed on the basis of properties of individual actors. Our example illustrates the extreme importance of distributions in rational choice explanations: The effects of macro-events depend on distributions of individual incentives in a social system. The literature on threshold effects further illustrates the importance of distributions of incentives. Therefore, it seems useful to include assumptions about distributions in rational choice explanation.

*E. Subjective and Objective Rational Actor Theory: Consequences for Micro-Macro-Transitions*

So far we applied a 'subjectivist' version of the rational actor theory contending that preferences and constraints as the actor perceives them are relevant for choosing the behavior which is - from the actor's perspective - best for him. From this 'subjectivist' perspective, 'objective' events may have a causal effect on perceptions or preferences. For example, assume a government lowers expenditures for police protection which diminishes the subjective probability of getting arrested - see panel A2 of figure 2. The subjective and not the objective probability is important because people's perceptions may be distorted.

An 'objectivist' version of rational choice theory which is often used in economics assumes that reality is not distorted by individual perceptions but that individual actors adapt to the real situation. In the previous example, an individual would experience the objective probability of being arrested after some time. In the 'objectivist' version, such macro-events like expenditures for prosecution are constraints, i.e. events that impede or promote individual goals. The researcher assumes that he knows these goals - one of them may be to avoid repression. In the above example the increasing objective probability would immediately affect individual action and, as a consequence, the crime rate (see panel E of figure 2).

These considerations suggest that micro-macro transitions depend on the kind of model applied. It seems that in 'objectivist' rational choice explanations the micro-macro transition from the independent macro- to the independent micro-variables is missing.

*F. Macro-Relations: Laws, Empirical Generalizations, or Spurious Correlations?*

Coleman assumes that there is a *causal* relation between macro-variables (see arrow 4 in figure 1). Is this a plausible assumption? It could be argued, e.g., that the correlation between protestant religious doctrine and capitalist organization developed because protestant religious doctrine includes certain values which influenced economic behavior. This behavior - and other circumstances not mentioned in Coleman's reconstruction - led to the development of capitalism. In this argument protestant religious doctrine has no direct, but only an indirect

effect on economic organization. The causal argument thus corresponds to panel A2 in figure 2.

Similar arguments can be made for our other examples. Take panel C of figure 2: Are repression, inequality and economic development causes for political violence? The model of panel C suggests that repression etc. lead to violence 'because' repression increases discontent and political influence which in turn raise violent action. Again, there seems to be an indirect effect of the independent macro-variable on the macro-outcome.

In general, it seems plausible that macro-relations are correlational and not lawful or causal statements, unless the dependent macro-variable is some aggregation of incentives. This statement reflects the state of macro-research: No macro-laws have yet been discovered.<sup>4</sup>

#### *Micro-Macro-Relations: Empirical or Analytic?*

Are the macro-micro transitions empirical hypotheses? This is certainly the case for the example in figure 1. It is not the case where individual properties are aggregated. Macrosocial variables like crime rate, voter turnout, income inequality, and cohesion (referring, e.g., to the number of dyads who like each other, divided by the number of all possible dyads of a group) are analytically related to the respective microsocial variables (criminal behavior, participation in an election etc.). Therefore, these micro-macro transitions cannot be subjected to empirical testing. Due to the importance of distinguishing between empirical and analytic macro-micro transitions graphical representations should take those differences into account. For example, analytic micro-macro relationship could be symbolized by lines and not by arrows.

#### *The Missing Links: Micro-Macro Theories*

Assume the micro-macro transitions are empirical hypotheses: What reasons speak in favor of their validity? Coleman points to this problem referring to relation 3 in figure 1. For example, what are the arguments for the validity of the hypothesis that political concessions increase discontent? There may be situations where people are highly satisfied with political reforms. The result will be that discontent *decreases*. As for the individual level, we need theories that can be applied to deduce empirical micro-macro relations. Up to now such theories are largely non-existent. Therefore, at present empirical micro-macro links are plausibility assumptions. We surmise that those assumptions only hold if certain

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<sup>4</sup> This statement is confirmed by the work of Lichbach 1989; 1990. He analyses the research tradition focusing on inequality and conflict. Among other things, he shows how the conflicting results reported in the literature can be explained by a rational actor approach.



conditions are given referring to distributions of incentives on the micro-level. Much research and theorizing has to be done to develop those theories.

### 3. Discussion

Many analysts are interested in tackling substantive explanatory problems. They regard methodological treatises as rather fruitless exercises of professional philosophers. Clarifying macro-micro transitions which is an important topic of the methodology of model building is not futile at all: It helps the analyst to avoid mistakes and gives him a heuristic tool that contributes to solve substantive explanatory problems.

The previous discussion does certainly not cover all possible cases of micro-macro relations. But the examples suggest that the basic scheme developed by Coleman is a fruitful basis for further developing the methodology of micro-macro transitions.

### Bibliography

- Alexander, Jeffrey C./Bernhard Giesen/Richard Münch/Neil J. Smelser (eds.) (1987), *The Micro-Macro Link*, Berkeley
- Coleman, James S. (1987), Microfoundations of Macrosocial Behavior, in: Alexander et al., 153-173
- (1990), *Foundations of Social Theory*, Cambridge/MA-London
- Hummell, Hans J./Karl-Dieter Opp (1971), *Die Reduzierbarkeit von Soziologie auf Psychologie. Eine These, ihr Test und ihre theoretische Bedeutung*, Braunschweig
- Lichbach, Mark (1989), An Evaluation of 'Does Economic Inequality Breed Political Conflict?' Studies, in: *World Politics* 41, 431-470
- (1990), Will Rational People Rebel against Inequality? Samson's Choice, in: *American Journal of Political Science* 34, 1049-1076
- Muller, Edward N. (1985), Income Inequality, Regime Repressiveness, and Political Violence, in: *American Sociological Review* 50, 47-61
- /Erich Weede (1990), Cross-National Variation in Political Violence. A Rational Action Approach, in: *Journal of Conflict Resolution* 34, 624-651
- Opp, Karl-Dieter (1979), *Individualistische Sozialwissenschaft. Arbeitsweise und Probleme individualistisch und kollektivistisch orientierter Sozialwissenschaften*, Stuttgart
- (1988), The Individualistic Research Program in Sociology, in: Gerard Radnitzky (ed.) *Centripetal Forces in the Sciences. Volume II*, New York, 208-224
- (1991), Processes of Collective Political Action: A Dynamic Model and the Results of a Computer Simulation, in: *Rationality and Society* 3, 215-251
- Podes, Stephan (1991), Polybius and his Theory of ANACYCLOSIS: Problems of not Just Ancient Political Theory, in: *History of Political Thought* 12, 577-587
- Wippler, Reinhard/Siegwart Lindenberg (1987), Collective Phenomena and Rational Choice, in: Alexander et al., 135-152