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## **Social Mechanisms as Special Cases of Explanatory Sociology: Notes toward Systemizing and Expanding Mechanism-based Explanation within Sociology\***

*Abstract:* The revival of action based explanations as well as their formal structuring have been two of the most important topics within explanatory sociology since the 1980s. The two newly developed approaches, being structural individualism and analytical sociology based on mechanism models, will be outlined in this article. The article is dedicated to a comparison of the aims and the formal structure of both approaches. It is shown that explanations within analytical sociology tend to be more realistic but also more complex. They do not differentiate between micro and macro levels in analytical terms and use micro mechanisms instead of an analytically strong action theory that makes it difficult to systemize mechanism models. On the other hand, structural individualistic explanations that use a general action law from which social interdependencies are to be interpreted as an opportunity structure can formulate a default-option from which models can be expanded and also worked out to mechanism types.

### **1. Introduction**

Sociology was not only diffused into many fields but largely lost its claim to be an explanatory science on a methodological basis after the Second World War.<sup>1</sup> Whereas the classics, specifically Max Weber and Emile Durkheim, emphasized sociology as an explanatory science sociologists today often work with ad hoc hypotheses and diagnoses of societies which do not refer to any theoretical knowledge. Different subjects and theoretical hypotheses change all too often, without any effects on sociological knowledge. Thus, it is not surprising that sociological theories and themes are short-lived and driven by random social events. Since the 1980s more sociologists have been working on the logic of multilevel explanation and reinforced the program of Methodological Individualism. Structural individualism in this sense means to explain all social phenomena with regard to individual properties. In other words, the causal factors are to be found on the micro-level. In this paper the structural individualistic approach as well as

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<sup>1</sup> Cf. Lindenberg et al. 1986; Boudon 1991; Esser 1996 and Mayntz 2004 generally.

analytical sociology or the mechanism approach are to be understood as specific variants of the general aim of an explanatory sociology and the logic of multi-level explanation (Hedström 2005; Coleman 1990). To this end, the basis and the requirements of the developing perspective of analytical sociology—that works with mechanism models in the sense of middle range theories—is presented regarding structural individualism as the older and more general approach that seeks to build up and improve general explanations (*section 3*).<sup>2</sup> Using the example of the competition mechanism it is then shown how mechanism models can be obtained and expanded using the methodological principles and tools of explanatory sociology in general and core ideas of structural individualism in particular (*section 4*). In a very short conclusion the idea of working with opportunity-mediated mechanisms as a default-option is outlined as a starting point within both approaches.

## 2. Mechanism-based Explanation in the Current Theoretical Debate

Mechanism-based explanations provide theses about why and how a constellation such as competition generates particular social forces and sets social processes in motion which in turn explain the rise of power structures and social inequality (Boudon 1998; Hedström 2005).<sup>3</sup> Norbert Elias (2000) and Heinrich Popitz (1992) are two of the few sociologists who have described processes of forming power and inequality, based on *models of competition*. Both have highlighted that intentional actors in a competitive relation typically bring about oligopolistic or monopolistic stratification patterns due to the conflict of interests. The driving mechanism is that every individual has strong motives to use every chance to increase his own position and to consolidate that position further at the cost of others. If there is no exit or no hierarchical regulation—as it is assumed by Elias and Popitz—every advantage is open to everybody and triggers a process of improving the opportunities of a few actors by worsening the opportunity structure of a lot of others. Once such a process is set in motion the privileged gain more and more in terms of opportunities, whereas others deteriorate even further because the opportunity structure of the winners is expanded in every step. The result on a macro level is an unequal distribution of opportunities like that of scarce social resources (trust relations, social capital, authority, reputation, social ties, etc.) or material resources (money, land, goods, etc.).

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<sup>2</sup> Whereas Peter Hedström and Richard Swedberg (1998) in their initial reader focused on “social mechanisms”, Peter Hedström and Peter Bearman (2009, 4) use the term “structural individualism” strictly in the sense of a methodological principle for building up analytical sociology. This notion has been introduced by Peter Hedström 2005 for defining a context-dependent-action-based sociology using formal methods like computer simulation (Birkelund/Manzo 2011, 297).

<sup>3</sup> Also Mayntz 2004, Maurer 2009, and actually Kalter/Kroneberg 2014 note that mechanisms are often spoken of, but that this is not referring to abstract, causal models that reveal the active mechanisms but to *real processes* or the *facts to be explained* (see chapter 2.3).

The “*monopoly mechanism*”<sup>4</sup> described by Norbert Elias concerns hard dropout competition which continues for as long as competitors have any chance of getting scarce resources, like land in the middle ages or managerial positions in the 21<sup>st</sup> century. Actors compete as long as they expect reward and own resources.<sup>5</sup> Those individuals who do not behave in this way suffer losses early on because others will harm them (Elias 2000). Elias and Popitz have more intuitively focused on situations of competition which offer specific opportunities which act to the detriment of others and thereby set processes of monopolization in motion; each step reinforces the next by improving the opportunities of few actors. Neither of them, however, has formulated a precise model of the effective forces and causal relations that trigger the process (see also Abell 2011).

Max Weber (1985[1922]), who defines sociology as an explanatory science, takes individual actions as the causal force in society. Subsequently, causal explanations of social regularities are deduced from meaningful individual actions especially in institutionalized contexts which describe objective action patterns (institutional individualism). In Weber’s view, empirical descriptions of singular or average actions as well as abstract causal models of individual actions like that of means-end rationality (ideal-type) are helpful in explaining action patterns which generate social phenomena. This is due to the fact that means-end rational actions are the most evident. Especially, sociologists should start to deduce such rational actions with reference to institutionalized social situations (default-option). Only if such models fail empirically will sociologists need to change their assumptions about individuals regarding empirical knowledge (Weber 1985, 1). Nevertheless, it took some time before the rediscovery of Max Weber’s explanatory-understanding sociology led to a multilevel action based model of sociological explanations which uses empirical information in order to provide more realistic explanations and to improve models when the deduced theses fail empirically.

A critical extension, related to Weber, from the Hempel-Oppenheim schema (1948) emerged with structural individualists. The Hempel-Oppenheim schema implies using a law of action and proof of the conditions for its application in order to logically derive social phenomena (see Maurer/Schmid 2010; Kalter/Kroneberg 2014). Instead of this, the theoretical movement of multi-level explanation and specifically structural individualism emphasize the use of a *general action theory* together with empirically informed models for describing social structures and for linking macro and micro levels (cf. in detail Coleman 1990; Esser 2004; Maurer/Schmid 2010).<sup>6</sup>

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<sup>4</sup> In contrast, the model of *complete market competition* used in economic theory assumes the existence of ensured property rights, the dismissal of violence in contract relations, and the overall opportunity to leave (see Weber 1985[1922], chapter 2).

<sup>5</sup> In game theory such constellations are analytically described as ‘zero-sum games’, in socio-economic analyses as “winner-takes-it-all markets” (Frank/Cook 1995) and in sociology as conflict structures with dropout effects (Maurer/Schmid 2010, 372 ff.).

<sup>6</sup> Weber would also see this as methodological institutionalism, because the act of explanation is not based on the action principle alone but also brings in the socially institutionalized context (Hedström et al. 1998; Udehn 2001).

In their early writings Richard Swedberg and Peter Hedström distinguish, based on the logic of the structural individualism and, in particular, on James Coleman’s “boot” (1990, 8f.), between three types of mechanism:<sup>7</sup> 1) situational mechanisms, 2) action formation mechanisms and 3) transformation mechanisms (cf. Hedström/Swedberg 1998a, 22f.). This differentiation has been lost recently in favour of the distinction between *elementary* and *social mechanisms* (Hedström 2005, chap. 3). Analytical sociologists like Peter Hedström aim to dissect complex social processes and specify mechanisms which lead to particular social patterns (Little 2012). In Peter Hedström’s view, the actor’s desires, beliefs, as well as opportunities are main causal forces. Causal *logical relationships* between all of them explain social phenomena. The main point within analytical sociology is “to explain complex social processes by carefully dissecting them, bringing their most important constituent components into focus, and then constructing appropriate models which help us understand why we observe what we observe” (Hedström 2009, 332). The foundation of the mechanism approach within analytical sociology consists of four principles of explanations based on actions, explanatory precision, abstraction, and reduction of complexity. In contrast to structural individualism, analytical realism is emphasized especially when it comes to assumptions at the individual level (Hedström/Swedberg 1989a, 24; Hedström 2005, 5). This is why Peter Hedström, in his later writings, takes the DBO theory as a micro foundation to explain action by different logical constellations of individual desires, beliefs, and opportunity structures, and asserts that it is more realistic than rational choice. From that point on, social mechanisms are regarded as constellations which describe how the action of one actor influences the actions of another actor by influencing desires, beliefs, or opportunities. To explain particular social phenomena means to choose one or more adequate models from social mechanisms. Within the mechanism approach elementary mechanisms, as well as social mechanisms,<sup>8</sup> are used simultaneously to decipher social processes. This means that not only an individual’s intentions or social constellations but also their causal relationships explain social change or collective properties (cf. Hedström 2005, 5; Hedström/Swedberg 1996; 1998).

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<sup>7</sup> They also state that they are following a proposition from Stinchcombe (ibid).

<sup>8</sup> Elementary mechanisms, also called „intra-individual mechanisms” (Hedström 2005, 78), are assumptions about individuals that explain individual actions through desires, beliefs, and opportunities. In contrast to rational choice theory elementary mechanisms explain action as a result of interrelationships between an individual’s desires (D), beliefs (B), as well as opportunity structures. Peter Hedström, for example, offers models of such elementary mechanisms that highlight some of the logical combinations of desires, beliefs, and opportunities as realistic: belief formation mechanisms like wishful thinking or sour grapes syndrome. The model of wishful thinking says that actors believe what they want so more actions are to be expected, whereas the sour grapes syndrome means that actors want what they believe they can get. In contrast, the model of rational imitation assumes that imitating others is to be expected in case of uncertainty and therefore the causal relation works between opportunities and beliefs (see Gambetta 1998, 103).

### 3. Principles, Requirements and Challenges of the Mechanism Approach

The mechanism approach, as elaborated and represented by Peter Hedström and others, in the context of analytical sociology (see Hedström/Bearman 2009),<sup>9</sup> shares, with explanatory sociology in general and structural individualism in particular, the claim to present *causal explanations*. The most important commonality between ‘structural individualism’ and the ‘mechanism approach’ is the claim to explain how social phenomena, such as inequality and power structures, are brought about by individuals acting in relationship to each other in social contexts.

There are therefore strong overlaps both between persons and between the methodological principles. Representatives of a multi-level logic of sociological explanation have frequently also put forward mechanism-based explanations, as for example in the case of Boudon (1988), Burt (2004), and Schelling (1998). Differences concern mainly the form and function of the assumptions on the micro level. Whereas some researchers (Coleman; Lindenberg) prefer simple action models and a general action law (action-theoretically based) in order to formulate complex theses on the macro level, other scientists emphasize working with more complex but realistic action models (Boudon; Elster) and therefore using either agent-base modelling combined with computer simulation (Hedström; Burt; Granovetter) or case studies (Gambetta; Bearman). In this sense, one can find in the writings of Raymond Boudon, Ronald Burt, James Coleman, Jon Elster, Thomas Schelling and others, a common *notion of mechanisms* within explanatory sociology. There are also differences when it comes to the role and function of the action theory. Nevertheless a common concern is to overcome pure empirical descriptions and to provide precise, realistic explanations. Mechanism-based explanations are, in this sense, causal explanations of social phenomena given on the basis of explicitly formulated abstract models, which state precisely the causal factors and the conditions of application.

#### 3.1 Principles of Multi-level Action-based Explanation

The multi-level model of explanation is based on the epistemological position of critical rationalism (Lindenberg 1989; Coleman, 1990). The resulting methodological principles are the adoption of limited knowledge, the postulate of critical theory examination and improvement, the economic use of assumptions and theories, abstract modelling, methodological individualism and logical situational analysis (Maurer/Schmid 2010). The formal structure, which was well developed in the 1980s, analytically differentiates between social structure and individual action (structural individualism). The explanations combine models of social relationships which describe how individuals are linked to each other and models of individuals which describe what motivates (intentions, interests, and values)

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<sup>9</sup> According to Hedström (2005, 5) ‘analytical’ comprises striving for explanations and abstract models that reduce a complex reality to its essential factors.

and enables individuals. In this sense the action model should help interpret the social point of view from an individual point of view. Therefore, it is argued, that the general assumption of rational-intentional action is best because it allows one to focus on particular situational aspects which influence the utility and expectations of individuals as well as offering a principle for deducing the action individuals would choose in such a context (Norkus 2000). Empirical assumptions about situation-specific goals and means-end-relations (bridge hypotheses) as well as different models of social action (game theoretical models, institution theories) can be introduced to broaden explanations using theoretical guidance.

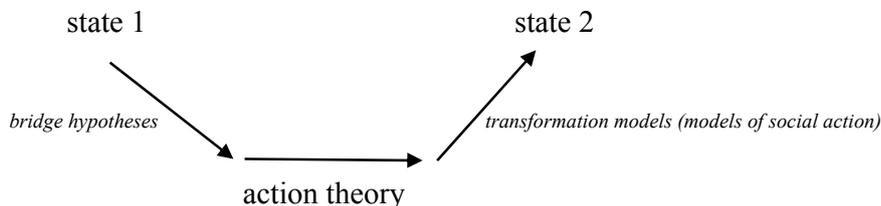


Figure 1: Multi-level model of explanations (Coleman 1990).

The model of multilevel, action-theoretically based explanations describe the micro level as simply as possible and yet realistically (Boudon 1987; Coleman 1990; Esser 2004). Representatives of such a formal structure reveal the causal effects of social structure (institutions, relationships, interdependencies) on individual actions and from those back to the social structure. Enhancements and corrections of assumptions are therefore to be incorporated firstly *at the social level*. The assumption at the micro level serves to deduce individual actions with regard to particular situations. The assumption of rational-intentional action focuses on relationships between interests. This means that situational aspects are interpreted as opportunities or restrictions from the view of individuals' interests (desires). What counts mostly is how the *actions of others* change the opportunity structure by increasing or decreasing the utility of different actions. The analytical strength of theoretically based multi-level action explanations lies in deciphering which *social factors* influence individual interests. This means primarily developing situational models which describe relevant interrelationships between individual interests, as in game theory. To the present, expansions have only occasionally been driven by models which capture the interrelationships between social situational variables and the individual's interests. The basic model of a successful explanation has been characterized by the fact that social factors or contexts are identified by a general action theory. The basic model of multi-level explanations in sociology can then be extended by introducing theses about when and how social factors (social relationships, networks, institutions) influence the individual's orientation, intentions, and capacities and thereby generate social dynamics (see Burt 1992; Granovetter 1990; Hirschman 1970; Weber

1985). If this is done, the analytical strength is lost and merely middle range theories and a strong link to mechanism-based explanations are to be expected.

### 3.2 The Formal Structure of Mechanism-based Explanations

At the end of the 20<sup>th</sup> century, Robert K. Merton, Jon Elster, Raymond Boudon, Renate Mayntz, Peter Hedström and others converted the basic idea of developing a set of ‘social mechanisms’ which can be applied to specific explanation problems (Schmid 2006; 2011). It became apparent, even in the early writings (Hedström/Swedberg 1998a), that a ‘third’ way between grand theories and empirical descriptions should be pursued. Merton’s proposal (1967) of middle-range theories was therefore taken up (Boudon 1991; Mayntz 2004). The initial impetus for the current mechanism debate came from a meeting initiated by Peter Hedström and Richard Swedberg which brought pioneers of the explanatory sociological approach together (Hedström/Swedberg 1998).<sup>10</sup>

Mechanism models do not separate models of action and social situations. Furthermore, mechanism-based explanations use complex mechanism models to decipher causal interrelationships on the micro as well as the macro level which bring about a specific outcome. A mechanism model figures out why on the occurrence of an input (initial constellation) particular effects emerge (Hedström/Swedberg 1998a, 25). In the kind of mechanism-based explanations developed by Peter Hedström *elementary mechanisms* explain how a constellation of desires, beliefs, and opportunities generates particular individual actions. Social mechanisms explain how actions are influenced by others: either desire-mediated, belief-mediated or opportunity-mediated. Mechanism models combine individual properties (beliefs, desires) and social opportunities at the same time. To explain means to specify mechanisms which decipher causal relationships between either individual desires, beliefs and opportunities or between the actions of others and individual desires, beliefs, and opportunities.

According to Peter Hedström actors are described by desires and beliefs which are interrelated with the opportunity structure. For this the starting point is not the assumption of intentional-rational action but elementary and social mechanisms. This means that not only the opportunity structure works as a variable, but also desires and beliefs. Furthermore it is also considered that an individual’s desires influence his beliefs as well as the beliefs are sometimes influenced by desires. The latter assumption is described by elementary mechanisms such as wishful thinking or sour grapes syndrome. For example, wishful thinking means that the belief of an actor is positively influenced by his desires (Hedström 2005, 39). The social, logical interrelationships between the action of an actor<sub>i</sub> and the desires, beliefs and/or opportunities of the actor<sub>i</sub> need to be outlined. There are desire-mediated, belief-mediated, and opportunity-mediated interactions. Social interdependency, in this sense, does not only mean that others change the opportunity structure, but also that they can change the beliefs and desires of

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<sup>10</sup> Both elementary mechanisms such as the “self-fulfilling prophecy” (Merton), “dissonance reduction” (Kuran) as well as social mechanisms such as “social influencing” (Sorensen) and competition (Stinchcombe; Hernes) are presented in the volume by Hedström/Swedberg 1998.

others. Mechanism models describe such complex interrelationships by figuring out causal relations that work step by step.



Figure 2: Mechanism-based explanations.

For this the mechanism approach recommends using and developing models of social mechanisms which describe how the actions of others influence the desires, beliefs, opportunities, and, last but not least, the actions of other actors. Those actions influence other actions in the next step so that sometimes a tremendous change in social patterns can emerge. For example, the famous notion of the “self-fulfilling prophecy” described by Robert Merton (1948) is a social mechanism which claims that an objectively false but subjectively true belief (Weber 1985) brings about actions which influence the beliefs and therefore the actions of others in such a way that the initially wrong belief becomes true in the end. This mechanism helps to explain why initially wrong rumours about bankruptcy can lead to insolvency: first withdrawals from one or more actors ( $A_j$ ) lead to even more withdrawals via belief-mediated processes ( $B_i$ ) so that other actors ( $A_i$ ) withdraw (more) money. If enough actors have withdrawn their money an initially sound bank is insolvent (Coleman 1990; Hedström 2005, 48).

Social mechanisms which describe the change of beliefs through the actions of others can also be seen as the default-option in the structural individualism approach. If in uncertain situations others’ actions are interpreted as a signal, rational imitation is realistic to expect and it can lead to tremendous change like the rise of conventions (Lewis 1964). The mechanism-approach as developed by Peter Hedström emphasizes that the actions of others influence not only the opportunity structure but also beliefs and desires. Because such processes are not analytically separated, complex interrelationships need to be outlined.

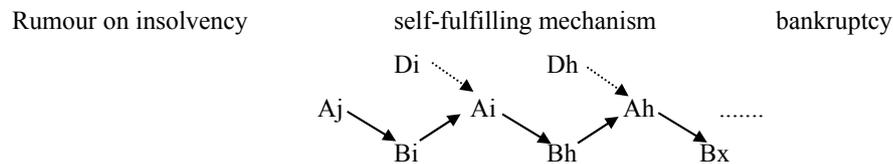


Figure 3: Explanation based on self-fulfilling prophecy and belief-mediation (Merton 1948; Hedström 2005, 59).

### 3.3 Mechanism-based Explanations Compared to Action Theoretically-based Explanations

First of all it is well to highlight that the mechanism approach shares the aim of explaining social phenomena by discovering causal relationships. Representatives of the structural individualistic approach do this by analytically differentiating micro and macro levels and by showing how particular social interrelationships influence individual actions and therefore the social or opportunity structure. To improve this kind of explanation means to describe the social factors more concretely. This can be done, guided by the action theory which helps one have a closer look at how situational aspects influence the expected utility of actions. According to this empirically enriched position, theses can be formulated about how those situational factors influence individuals' actions by changing the opportunity structure.

However, mechanism models<sup>11</sup> describe particular, initial constellations and the driving causal forces and interrelationships which lead to a social outcome in abstract terms. This can occur through the explicit modelling of the ongoing reinforcement of either actors' beliefs, desires or opportunity structures. This can also be done, however, by modelling complex interrelationships between two or more variables which reinforce each other, step by step. (See *section 3* for further detail.) It is a question of embracing the *dynamic of social interactions* which lead from an initial constellation to a specific distribution pattern.<sup>12</sup> Sometimes different processes need to be linked in order to explain social phenomena, such as the emergence of power structures and social inequality. Important social mechanisms are competition, control, trust building, belief-mediation, to name a few. There, while the literature often calls the social outcome a mechanism, this dismisses the point that the mechanism approach identifies the concrete underlying causal relationships and processes like competition or learning. Power and inequality as well as cooperation are the outcomes explained by showing that one of the aforementioned mechanisms (competition, power, learning, control) has worked.

The mechanism approach is indeed a causal explanation, but it omits, in contrast to the structural individualistic approach, the logic of a three step explanation. While structural individualistic explanations use a general action theory to interpret social constellations, as well as to deduce individual actions, and transform them into macro phenomena by aggregation models, mechanism-based explanations refer to complex models which decipher causal relationships between individuals' desires, beliefs, and opportunities and the actions of others, or between individual desires, beliefs, and opportunities. Within the mechanism approach the rational choice theory is not an assumption chosen due to its analytical power but as a special combination of a desire-belief-opportunity structure.

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<sup>11</sup> Although the term 'mechanism' or 'social mechanism' is repeatedly used to refer to real processes (see Hedström 2005; Mayntz 2004; Schmid 2006; 2011).

<sup>12</sup> In place of the theory of rational choice, Hedström applies the DBO theory describing individual actions in terms of desires and beliefs to model actors realistically. He thereby recognizes the fact that the actors' intentions, beliefs, and rationality change, so that the adoption of a fixed action principle seems unrealistic (cf. Maurer 2010).

Therefore, Peter Hedström distinguishes the mechanism approach from the so-called ‘covering-law explanations’, as put forward by Hempel and Oppenheim (1948), as well as from statistical correlations (Hedström 2005, 14ff.).<sup>13</sup> Instead of deducing rational actions in the light of social situations, mechanism models focus on the dynamic interplay between individuals’ desires, beliefs, and social aspects (opportunities). Therefore, models which specify how individual actions are dependent on what others believe, desire and do are at the core of the approach. This is why a lot of work has been done to explain why social patterns are changed through small happenings which produce a change in individual beliefs, desires, and opportunities.

Mechanism-based explanations, by dissecting complex social processes and building up models, try to explain how actors influence others and thereby trigger processes which bring about particular social phenomena such as unequal distributions. In this light, patterns of social interaction are seen as a causal force of their own because they influence not only the opportunity structure but also desires and beliefs. Thus, the opportunity structure is no longer the main explanatory factor. Mechanism-based explanations are more realistic than multilevel explanations based on a general action theory. This is because they take into account the fact that the social context influences actions not only via opportunities but also through beliefs, as well as desire-mediation. This leads to models which show how the social context influences individuals’ desires, beliefs, and opportunities and thereby bring about different, but typical social processes which result in social aggregates.

Furthermore, because of the mutual interrelationships between individual desires and beliefs it is no longer assumed that actions rationally reflect weighed desires or objective rationality but rather subjective beliefs and socially determined interests. In the end, social phenomena are explained by specifying mechanism models which name constellations of actors and their desires, beliefs, and opportunities as well as interrelationships among them. Social processes are seen as the result of complex interrelationships which are analytically described by mechanism models. Thus, neither intentions nor opportunities are the only relevant explanatory factor. This means that there is no theoretical guideline for expanding the assumptions about particular social factors in order to reveal their influence on individual actions. According to the DBO theory every logical combination could work. As long as there is no general argument used for describing individuals, neither social nor individual factors can be marked as important or worth specifying empirically. This means that researchers are almost without any theoretical guidelines when specifying or systemizing mechanism models. Especially when using the DBO theory, the only guideline is to assume whether desire-mediated, belief-mediated, or opportunity-mediated mechanisms might help in identifying the important social relations. This is why Peter Hed-

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<sup>13</sup> Hedström therefore somewhat misinterprets the Hempel-Oppenheim schema as being inapplicable in that there are no ‘social laws’ that, in his view, would require it, and because it does not give action and intentional explanation the place that it deserves (Hedström 2005, 209). Hedström himself uses micro or elementary mechanisms like that of rational imitation for mechanism-based models in place of a general action law (cf. also Diekmann 2010; Maurer 2010)

ström suggests working with agent-based models and simulations in order to handle the complexity within the mechanism approach. However, this means dismissing the strength of explanations based on a general action theory which can point out what the main causal force is and how social interactions or interdependencies work through individual interests and the way they are related. From that point on, theoretically guided, empirically informed improvements can be made.

### 3.4 Challenges of the Mechanism Approach

Methodologically founded and theoretically oriented contributions to the ‘mechanism approach’ bring together the aim of providing causal explanations and building up a pool of mechanisms which help explain how particular constellations are transformed into particular social phenomena. Currently, for the most part, mechanism models explain the emergence or change of distribution structures (Boudon 1998; Schelling 1998; Tilly 1998; 2001; Hedström 2005) and social expectation patterns (Boudon 1994; Elster 1983). Thomas Schelling (1998, 37ff.) protested early on that the expansion and success of the ‘mechanism approach’ depends on whether and to what extent it is possible to build mechanism models so that common ‘key characteristics’ can be recognized. Only then, can mechanism models be sorted into types in order to recognize ‘families’ or ‘types’ of social mechanisms in the sense of general models. The mechanism approach, therefore, includes establishing, improving, and reconstructing mechanism models as well as the systemization of these models for such types. Peter Hedström differentiates elementary and social mechanisms that describe desire, belief as well as opportunity-mediated processes. In his opinion, this helps to understand how social interaction works by precisely deciphering how the actions of one actor will influence those of other actors via a change in desires, beliefs, or opportunities. The causal processes which are supposed to bring about social phenomena are mutual interrelationships between actions, mental states (desires and beliefs) as well as opportunity structures. Mechanism models describe the way an individual’s action influences desires, beliefs, and opportunities of others and therefore generates and triggers social processes which end in sometimes surprising social patterns. Because of the DBO theory the analytical point of reference is not very specific. The choice of relevant mechanism models as well as the building up of a mechanism pool is due to intuition, inspired by rational choice theory or founded on empirical knowledge. Because of this, Peter Hedström counts on agent-based modeling and simulation (sometimes also on differential equations) which help simulate how an initial constellation, triggered by random actions, of desires, beliefs and/or opportunities change from one step to another bringing up special group properties (unemployment rate), network structures (strong ties) or distributional effects (mainly social patterns of beliefs and desires). Nevertheless, the mechanism approach and structural individualism have models in common which decipher causal relationships between opportunities and individual actions mediated mainly by expected rewards. This can be done by showing how others influence the opportunity structure of others by reducing

uncertainty through information, trust, etc. (e.g. Burt 1992; Granovetter 1990). However, representatives of analytical sociology and the mechanism approach argue that such direct causal relationships between opportunity structure and action are rare and normally unrealistic. Therefore they start with complex mechanism models, from the very beginning, which are intuitively chosen.

#### 4. Expansion of the Mechanism Approach

Newly developed mechanism models within analytical sociology decipher all kinds of logical combinations between actions and desires, beliefs, and the opportunities of others. This is why mechanism models are normally built up separately, without being linked together. Furthermore, mechanism models use desires and beliefs, as well as opportunities, as causal factors, which makes it difficult to expand the mechanism approach by integrating models into general types.

Thus, it is suggested that one start by considering such initial constellations which work on actions that change the opportunity structure of others. This allows, as it is suggested in multilevel explanations based on a general action theory, for the broadening of the models by empirically informed theses about those situational aspects or patterns of social action that matter as an opportunity structure. This is exactly what Weber, Popper and others had in mind when they suggested starting with simple assumptions and models and enriching them step by step. The principle of ‘decreasing abstraction’ (Lindenberg 1992) means to describe actors as simple, as well as social constellations, as much as possible and to enrich those models when the default-option of pure interest-oriented actions in social contexts interpreted as an opportunity structure fails. Then the methodological principle states that additional empirically informed theses are to be introduced in the first step on the social level because the sociologist should try to primarily explain the influence of social factors.

This means developing mechanism models as more realistic variants of a general and therefore simpler mechanism type model. For example, the general mechanism of competition can be worked out by starting with a description of how the actions of some reduce opportunities for others. Then the social process of discriminating and dropping out depends on the extent to which others can control scarce goods and resources. The more realistic sociological models are, the more complex aspects of a competition relation they take into account. In mechanism models sometimes social factors are no longer the explanatory factors, but instead the change of the mental state of individuals.

##### 4.1 A Proposal for Theory-driven Systematization of Mechanism Types

The methodological rule of decreasing abstraction states that one start with simple assumptions and models that work as a default option which can be empirically broadened. Such a default option could be opportunity-mediated

mechanisms within the mechanism approach. This means figuring out social relations between rational-intentional actors where one actor influences the opportunity structure of others. Structural individualists also start from this option by outlining constellations of complementary interests, common interests, and conflicting interests.

From that point, the initial constellation is described from the view of rational actors in terms of the influence others have on the rewards of their actions. Social interrelationships are described in the first step as inter-relational, being between interests. This means describing how the costs or benefits of actions are influenced by the interest constellation. From there, simple models regarding constellations of interests can be expanded and systemized by additionally taking into account how the constellation leads to a change in the belief systems or desires. So, constellations such as common interests, complementary interests, and also conflicting interests<sup>14</sup> can be elaborated by assuming that individual actions are not only influenced by others via opportunities but also via belief or desire-mediation. This allows one to describe causal relationships between individual actions and a change of expected benefits as well as that of desires. To describe social constellations by figuring out how individual interests are related to each other means nothing less than an abstraction from other social aspects and other action orientations (i.e. non-reflective actions, desire-mediation, value rationality).

More realism as well as more complexity comes into the models when one not only assumes that opportunities are changed by social-embeddedness (relations, network structure, institutions) but also by subjective expectations (beliefs) and interests (desires). Thus, it is important to have a guideline which helps figure out what the relevant causal relations are, because not every change matters in every constellation. For example, a conflict of interests can be influenced by a change in the belief system but mostly when powerful actors are successful in enforcing their own interests and the belief systems which enforce them.

The relationship between individual intentions is treated as being the core logic with the aim of understanding the mechanisms that come along with common, complementary or opposing intentions and help explain the transition from the given initial state to expectable new states. These initial constellations can be differentiated on the bases of their basic logic and the mechanisms which can be expected. However, they can increasingly be specified by first focusing on a central problem and then also taking relationships between interests and values into account. It can then be shown why and how particular mechanisms emerge. Of course, known models can be used as well as developing new ones (cf. Maurer/Schmid 2010). Above all, the initial constellations are to be honed using empirical propositions, which together with the basic model and the processes described by them can also be refined. For example, when individuals seek orientation because of uncertain benefits of different actions they imitate what others do or have done successfully. If this ends up being beneficial, more actors follow suit. In the end a stable convention is established which no actor

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<sup>14</sup> Issues and aspects of orientation in an uncertain situation would, on the other hand, be relevant for elementary and social mechanisms of belief-mediation (see also footnote 10).

is interested in changing because it not only provides orientation for individuals

<i>social constellations mediated by interests</i>	<b>situational logic problems of social action and relations</b>	<b>action logic</b>	<b>explanatory mechanism(s); chosen by considering the action logic</b>
<b>complementary interests</b>	a) <i>individual needs for orientation</i> in order to coordinate; improvements by newer or better information through others	to know what action fits (best)	a) <i>rational imitation</i>
	b) <i>mixed-motives</i> ; improvement by social expectations that provide key advantages to some actors	strategic action with regard to what others will do	b) <i>competition and relative advantages</i>
<b>common interests</b>	c) <i>cooperation within small groups</i> ; improvement by particular social and collective actions	free riding; to live at the cost of others but be socially embedded	c) <i>learning and social control</i>
	d) <i>cooperation within large groups</i> ; improvement by particular social and collective actions	free riding; to live at the cost of others	d) <i>hierarchic control institutional entrepreneurs</i>
<b>conflict of interests</b>	e) <i>conflict</i> ; benefits for all by social regulations and individual benefits for some	to get as much as possible	e) <i>competition within rules (property rights)</i>
	f) <i>individual benefits for some</i>	to get as much as possible, at least more than others	f) <i>competition by power (social distinction and/or discrimination)</i>
<b>no interrelationships by interests</b>	g) <i>autonomous decisions</i>	to choose actions	g) <i>elementary mechanisms</i> ; e.g. wishful thinking, sour grapes syndrome, rational imitation)

Table 1: Social constellations in terms of interests and opportunities.

but also has established new action opportunities which otherwise would not be possible. Examples of this include communication through mobile phones, e-mails, Twitter and Facebook. Another, quite important example of building conventions by accident is the price mechanism which is well-described in economic market theories. If a lot of individuals compete on the supply side, every additional demand will increase the price of the resource, but will also motivate suppliers to increase production in the next step so that prices fall, and in the following step the demand will increase. The action theory precisely states that due to the competition on the supply side a higher demand will lead to higher prices which motivate more actors to produce and thus prices will fall. This leads to a reduction in demand. Step by step, supply and demand go up and down

until no individual can improve its utility by buying or selling more or less. This situation is interpreted as Pareto-equilibrium where demand and supply meet and no individual can improve it by his own decision. This point will be reached if all actors are free in their choices since competition then triggers the process of price building and thereby the distribution of the resources on the macro level.

To sum up, the relevant factors and their causal interaction are to be understood in a more or less abstract form.<sup>15</sup> The mechanism approach provides more complex and realistic explanations, but suffers from a lack of generalizability as well as from the fact that no general theories are established. This can be mitigated by establishing mechanism types such as contribution mechanisms like competition, which are specified on the basis of initial constellations from an individual point of view. Thus, different forms of competition can be analysed.<sup>16</sup> Where mechanism types or families (Schelling 1998) such as the competition mechanism are identified and developed in terms of their basic logic, models of interplay between mechanisms can be conceived (e.g. Mayntz 2004). Thus, the interaction between competition and trust would be pivotal in explaining how power cores form, starting from the cooperation of a just a few. These power cores can not only render many powerless but, above all, also create competition between these actors and further reduce their organizational capacity and power. The competition mechanism works on *power accumulation* by self-reinforcement and mutual reinforcement with social gradation and inequality. Other complex models describe a negative relationship between exit and voice (Hirschman 1970) for example, where slumps in the performance of any player also undermine collective capacity for criticism and thereby doubly undermine recovery. Thus migration and declining ability to criticize result in a downward spiral, mostly ending in collapse (Maurer 2009).

#### 4.2 Conflict Structures, Competition Mechanisms and Distributional Effects

Using the context of competition it can be seen how mechanism models are built up and used, starting with simple opportunity-mediated processes combined with the model of intentional-rational actors. From this point, more complex processes of social interaction can be introduced so that the release of mechanisms can be concluded. Hypotheses which propose why certain mechanisms are to be expected in specific initial constellations are therefore necessary in order to expand the mechanism approach into a structured pool. Statements as to why additional causal factors and relationships should be taken into account can be found in the action theory.

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<sup>15</sup> Game-theoretical models provide highly abstract models of the described social interrelationships, but name precisely the problem logic of the initial conditions.

<sup>16</sup> Both describe the intensifying effects of competition subject to the condition that there are no alternatives, that resources are finite, and that cooperation between a few has an adverse effect on the many (cf. in detail Maurer 2006; Maurer/Schmid 2010).

#### 4.2.1 Competition by Relative Advantages: Mixed-motives

Neither power nor competition mechanisms are expected to be relevant in *initial constellations* with a common concern or defined as a subjective problem of orientation, since, in both cases, what others have has no direct influence on the opportunities of others. Moreover, both cases describe a constellation where others sometimes increase positive awards and signal what might be expected. The initial constellation of common concern, however, allows for free-riding which then also affects good-natured individuals so that, with egoists encountering each other, free-riding becomes contagious and the failure to achieve common goals is systematically undermined. Only when mechanisms, such as that of learning or control, take hold, is this process broken and collaboration established. This is because positive experiences, such as control, increase the expected probability of getting beneficial returns because certain actions of others are more likely. It therefore depends on whether restraint alone is dominant or whether the two other mechanisms set in, and perhaps learning and control reinforce each other, in such a way that the other mechanism comes to a standstill. Which mechanism prevails depends on group size and group composition because these two factors mainly enforce the effects of learning and control (Raub/Buskens 2004).

In constellations of mixed-motives and conflicts of interests the underlying logic makes it reasonable to use competition mechanisms combined with power mechanisms which subsequently lead to stable structures of inequality and monopolies of power. This is because benefits cannot be fully acquired by individuals who contributed, but rather by situational factors. Social relationships help in getting relative advantages which increase individuals' own power position by weakening that of others. Examples of this include opportunities to build up coalitions, organizations or networks which lead to complex relations of dependence. Whether it comes to making power-based gradation processes and whether these open out into a stable hierarchical social structure, will depend primarily on whether there is a power centre which is able to set the interested parties in competition with each other for relative advantage. The strength and equipment of the power centre and the relationships between those 'subject to power' are particularly relevant here. A hypothesis to be derived is that the greater the dependence of the power centre and the greater the competition among the powerless, the faster the process of building inequality and the weaker the possibilities of a change become. This is due to the expectation that benefits from successful cooperation and coordination against the powerful are not possible. It follows that the greater the competition among individuals by differentiation and the stronger the power positions, the more the social inequalities and hierarchies will fail. What might help reduce or stop such processes are all kinds of situational factors which reduce competition, such as social integration in small groups or networks, in order that positive experiences can be made and enforced by learning and control. The course of the process is determined mainly by the interference of power and competition so that the opportunities of a few actors improve little by little, while the opportunities of many others get worse and worse until there is no more hope of changing the established order. The process depends in reality on many factors but mostly on every chance to use

and thereby build up power and dependencies which lead to a complex structure of inequality.

#### 4.2.2 Competition under Antagonistic Interests

Competition is also to be expected in constellations dominated by an antagonistic conflict of interests because in this situation it is even more important to use slight advances to eliminate others and to build up one's own position. A closer look at Norbert Elias and Heinrich Popitz's analyses in this context shows that both explained a variant of the competition mechanism.<sup>17</sup> In this constellation, the general mechanism of competition can be analysed under the precisely formulated conditions of zero-sum games. In the very simple case of a zero-sum game played by two individuals, no cooperation or strategic action is to be expected. Furthermore, and a little bit surprisingly, there could be a Nash-equilibrium, if the ones to suffer accept because in that way they can minimize their loss (Maurer/Schmid 2010, 373ff.; 393ff.). However, this is only to be expected if there are no other social relations which give opportunities for the strategic collaboration of some (a few) by exploiting others. If there is a restricted and essential amount of scarce resources every little advantage creates slight advances, which improve the position or opportunities of a few but make that of the many worse. The competition dominates and triggers a process of power building which distorts the competition by differentiation and selection. This starts a chain reaction which gives the winner of the first round an advantage in the second, and on which he can build in every further round. In addition, the resources gained also enable him to extend the dependence of others on himself. Depending on the situation (characteristics of the resources being competed for, number of actors, and other social issues such as network integration), elimination competitions are inevitably set in motion, producing just one or a few winners and many absolute losers. Variations in the process are determined by the number of participants and the scarcity of resources.

The competition mechanism acts differently, according to the initial constellation. We highly recommend beginning by looking at those social factors which influence the opportunity structure of the competitors. Basically, the objective opportunities are determined by the logic of relative advantage which comes into play through the returns on coordination. If there are relative advantages which allow for a reward to some actors by excluding others, a process of discrimination is set up that undermines cooperation; so, cooperative relations among them decrease, and dependencies from the centre increase. In the long run a hierarchical structure of inequality comes into being which functions on competition of relative advantage. Above all, where cooperating groups form through the development of trust, learning or control, such processes of competition by gradation can be interrupted and cancelled, or be redirected. For empirical studies,

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<sup>17</sup> Mario Bunge (2013[1999], 21f.) has pointed out that, for social systems, the mechanisms of cooperation are relevant alongside the competition mechanisms and explained this on the basis of the classical figure of the 'triad' (see also Simmel 1983[1908]). Because exploitation is possible, two-way cooperation is entered into and is stabilized through the exclusion and exploitation of a third party. This explains why teams in organizations, in private friendships or artist groups break down so often.

specific hypotheses can be established for the process and the expected structure of power and inequality, based on the type and social importance of the relative returns and the existing social bonds. Both mechanisms, competition and that of social learning and control, intervene because the first one undermines cooperation and collective action in order to change the structure, whereas the second one helps to support it. In so far as a purely conflictual structure—formally described as zero-sum game—is present, it can be assumed that there are no relative benefits to compete for but only *absolute gains for one which leads to absolute losses for others*. Under this condition the basic mechanism is competition and once an advantage has been gained, this is used in order to concentrate power and to weaken the other actors involved. Rational actors in this case can minimize their loss by accepting a given distribution which only benefits a few others. Variations on this process are to be understood in terms of changes in the initial opportunity structure or constellation. An important key to this is the consideration of alternatives or exits, because they suspend the competition mechanism at least partially.

## 5. Do Explanatory Strategies and Power Follow from Formal Structure?

In this paper the formal structure of multilevel sociological explanation has been discussed. Firstly, it was shown why multilevel action based explanations have gained a revival in sociology due to their formal structure. Secondly, the recently developed mechanism approach in the context of analytical sociology has been described as a variant of multilevel explanation. Thirdly, opportunity-mediated mechanism models have been discussed as a commonality of the structural individualism and mechanism approaches, which can help to build up general mechanism types and therefore a structured pool of mechanism models, as was illustrated in the example of competition.

Among the obvious weaknesses of sociology at present is the absence of theory development and integration. The macro-micro-macro debate, with the resulting extension of multi-level action based models of explanation, implies a change. Structural individualists (Boudon 1987; Coleman 1986; 1990; Lindenberg 1989; 1992) have claimed since the 1980s that neither purely macro nor purely micro theories (most of all no pure logical deductions in the sense of the Hempel-Oppenheim schema) provide proper explanations within sociology. For this, the main effort is to develop explanations which combine analytically differentiated assumptions on the micro and the macro levels. For this reason, structural individualists claim, in reference to Max Weber and Karl Popper, that by starting with a simple action model, a general action law can function as a theoretical guideline for interpreting social contexts. This is why most structural individualists start their work by combining the assumption of rational-intentional actors and models of social relationships that refer to the interdependency of individual interests. It can be marked as default-option from which expansions are made when the very abstract model lacks empirical proof. Then the methodological

principle of decreased abstraction postulates to enlarge the situation model by looking for additional empirical factors which broaden up the discussed social interdependencies in terms of opportunities. Also, additional information concerning the core of the action model, like empirical theses about what interests are important in concrete constellations, can help to expand the explanations alongside the core argument. The methodological rule is to expand the models along factors which are regarded as relevant from the action theoretical perspective, such as social relations, social institutions and social distributions. They are assumed to function as an opportunity structure for individuals.

The mechanism approach also responds to the deficiencies of purely macro- and micro-theories, the Hempel-Oppenheim schema and diagnoses about society involving no theory (Hedström 2005, 4). Furthermore, the mechanism approach seeks to open ‘black boxes’ and reveal the *causal mechanisms* which give rise to complex social processes. In particular, those representatives of mechanism-based explanations, who are also committed to explanatory sociology, such as Raymond Boudon, Ronald Burt, Peter Hedström, Renate Mayntz and others, indeed want to identify *causal relationships* through abstraction, but reject, as unrealistic, the use of a *general action law* as a micro foundation. In the mechanism approach, the sociological facts to be explained are deduced from an initial constellation and one or more mechanism models which decipher causal relationships between individual and social factors. This is why mechanism-based explanations work with social as well as with elementary mechanism models. In order to handle complexity formal methods are emphasized. Peter Hedström has argued for building up causal abstract mechanism models which are realistic in the sense that the social constitution of individual desires and beliefs, as well as psychological (elementary) mechanisms, need to be taken into account. This leads to models that link opportunity, as well as belief or desire-mediated processes. Therefore, the mechanism approach on one hand uses simulations to capture various changing relationships between action and situation. On the other hand representatives of the mechanism approach in explanatory sociology emphasize empirical concepts in the sense of middle-range theories, or like Norbert Elias and Heinrich Popitz case studies (see Hedström/Bearman 2009).

There are three main implications of working either with the formal structure of structural individualism or within the logic of a mechanism-based explanation. On one hand, action theoretically based explanations, specifically structural individualism, represent where extensions of models are helpful for increasing the explanatory power for sociology. They analytically differentiate micro and macro levels and use the core argument of the action theory to interpret social contexts into action opportunities and to deduce the actions typically chosen. Secondly, the effects caused by individual properties and that of social relationships can be differentiated. Thirdly, with reference to the methodological principle of decreased abstraction, the very starting point is a simple model of rational-intentional action and of social interdependencies which function as opportunity structures describing how individuals are related to each other through their interests. From this point models of social relationships can be expanded, as well as related to more general mechanism models such as competition. Then

a systemization of mechanism models, a structured pool of mechanism types, and a theoretically guided improvement of knowledge are possible.

On the other hand, the explanatory power of mechanism-based explanations results from complex models deciphering different relationships between actors, their properties, and opportunities. To explain why and how an initial constellation brings about social processes, a mechanism models how one initial variable influences individuals' desires, beliefs or opportunities which leads either to a reinforcement of that very specific variable or a change of other variables so that in the next step the individual's desires, beliefs, and opportunities are changed in a particular way so process chains are set in motion. Since an actor's mental state (desires, beliefs) and the social structure (opportunities) work as causal factors and as variables, the function and effects of individual and social facts cannot be differentiated. Social factors (opportunities) as well as individual desires, false beliefs or socially influenced interests can be causal factors in social processes. Therefore, neither a theoretically guided expansion nor a systemization of mechanism models is easy. On the contrary, the mechanism approach chooses models by intuition in order to improve or calibrate (Hedström 2005) them by formal methods, like simulations. However, mechanism models achieve a higher level of complexity and are indeed a special form of multi-level, action-based explanation which express causal relationships and the conditions for their use. Mechanism models are limited to the named initial constellations being either concrete, typical or general (Boudon 1998; Schelling 1998).

It is therefore possible and sometimes useful to present mechanism models more simply in analytical terms, in order to clearly work out the basic logic of the mechanism as well as to make central variables and causal relationships explicit. This was demonstrated here by the example of competition. The basic mechanism was developed based on a model of opportunity-mediated processes and the simple assumption of rational-intentional actors. Then constellations of pure conflict and those of relative advantages can be elaborated and likewise expanded by empirically informed theses about the number of actors and rounds as well as the qualities of resources involved. Extensions to the central social factor, namely the competition relationship, can then be guided by the underlying action theory and the named effects can be specifically recorded and tested using empirical propositions. For the competition mechanism discussed here, it is seen that pure conflicts can be expected to convert, by means of relative advantages and power, into stable, asymmetric distributions. However the specific procedure concerned depends on social factors like the number of actors and the nature of the desired resources. To differentiate competition models one can choose either relative advantages or hard drop out competition. The choice of mechanism models is still largely dependent on intuition or empirical knowledge. The further development of the mechanism approach will therefore depend on whether theory-based work is successful. Only then will a theoretical systematization of mechanism types be possible. The specification of general conditions of use would facilitate not only the choice of mechanism models in concrete research but would also give support to the basic concern of explanatory sociology to constantly check and improve theories and models.

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