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**The Definition of the Situation and Variable
Rationality: The Model of Frame Selection as a
General Theory of Action**

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1. Introduction

According to James Coleman's (1986) well-known macro-micro-macro model, explanations of social phenomena require to illuminate how the social situation influences actors and how their behavior in turn affects the social situation. These two steps are causally linked and heuristically guided by an intervening third step: the explanation of behavior itself. It follows that the extent to which the study of social phenomena can become a cumulative enterprise depends decisively on whether researchers make use of the same underlying theory of behavior. For this reason, the development of a general theory of action constitutes a major goal in the social sciences.

During the last decades, rational choice theory (RCT) has repeatedly been portrayed as one of the most promising candidates for a unifying theory of action. As has been convincingly outlined by Coleman (1990), its main advantages are to be seen firstly, in the intuitive appeal of an explanation that treats behavior as purposive action grounded in subjectively rational considerations, and secondly, in the analytical precision and explanatory power that comes with the "specification of purpose as the maximization of utility" (p. 18). Notwithstanding these favorable characteristics, for a long time RCT has not stood for the unity of the social sciences, but for the opposition between the disciplines of sociology and economics and their respective models of man: *homo economicus* and *homo sociologicus*. Sociologists vehemently resisted the idea that social order could be reduced to a cooperative equilibrium between rational agents and that action itself could be understood as maximizing one's utility – as exemplified by Emile Durkheim's critique of Herbert Spencer. It was not before the restrictive assumptions characteristic of *homo economicus*, e.g. full information and solely egoistic and instrumental preferences, had been relaxed that RCT's field of attraction could expand far beyond the limits of economics, holding the promise to provide a general theory of human behavior (Becker 1976).

However, there is still persistent opposition to RCT in sociology and political science, and the increased usage of RCT within these fields has led simultaneously to intensified debates over its status. A methodological line of criticism argues that by the very attempt to explain all kinds of behavior, RCT has lost its explanatory power that was entailed in the restrictive assumptions characterizing *homo economicus* (e.g. Bohman 1992; Bunge 1996; Smelser 1992). By contrast, an empirical line of criticism maintains that even in its widest formulation, RCT cannot account for essential aspects of human behavior and that these limitations are indicative of its failure to provide a truly general theory of action (e.g. Boudon 1998; Elster

2000; Taylor 1996). This line of criticism has contributed to the emergence of new theoretical movements that aim at re-establishing the importance of institutions, ideologies, and culture for the study of social reality, e.g. the various forms of “new institutionalism” that have become prominent in sociology (DiMaggio and Powell 1991; Nee 1998), political science (March and Olsen 1989), and economics (North 1990).

This article focuses on two basic phenomena that in particular are beyond RCT as a theory of action and thus constitute main sources of enduring criticism and theoretical counter-movements. The first is the process of the *definition of the situation*, i.e. the “framing” of a situation, during which significant symbols activate certain mental models, especially cultural ideas and normative commitments, that significantly shape subsequent behavior (Etzioni 1988: 93-113; Lindenberg 1989; Parsons 1937; Thomas and Thomas 1928). The second is the fact that people are capable of different degrees of rationality, sometimes engaging in a systematic consideration of future consequences as assumed by RCT, but sometimes following automatically unquestioned rules (Elster 1989; Etzioni 1988; Schütz 1970; Simon 1997; Vanberg 2002; Weber 1978). This phenomenon, which we henceforth call *variable rationality*, has been intensively investigated in cognitive social psychology, giving rise to the so-called dual-process theories (Chaiken and Trope 1999). Both the definition of the situation and variable rationality constitute anomalies of RCT insofar as it assumes that actors have stable preferences and behave like forward-looking utility maximizers; each is simultaneously of crucial importance for a general theory of human behavior.

Attempts to account for empirical manifestations of both phenomena within existing approaches suffer from two fundamental problems. The first is *the problem of one-sidedness* that results from trying to simply incorporate substantially different phenomena into an existing approach. Thus, within RCT internalized norms constitute only an additional argument entering an actor’s utility function, i.e. a special kind of incentive that is part of the overall cost-benefit calculation. Normative sociology, on the other hand, views rationality mainly as a special kind of normative orientation, e.g. as a part of the roles institutionalized in modern economies. Secondly, there is *the problem of underspecification* that only concerns the sociological approaches formulated more or less explicitly in opposition to RCT. The classical, as well as the more recent proposals for a general theory of action in sociology rely mostly on descriptions, systematizations, and typologies. They therefore lack RCT’s analytical precision, which supports a deductive style of reasoning and equips social scientists with formalized models of human behavior and social processes. Hence, the sociological notions of a definition of the

situation and variable rationality still await a clear conception of the underlying processes that can be utilized to *explain* action as a selection from among objectively given alternatives. Even critics of RCT admit that up to now, no integrative model of human behavior is available that can principally compete with RCT as a theory of action (e.g. Bunge 1996; Elster 2000; Yee 1997).

The following contribution is an attempt to formulate such a general theory of action that integrates sociological and economic accounts of human behavior without depriving either of its substance – thereby retaining RCT with all its accumulated research results – and that translates the sociological ideas of the definition of the situation and variable rationality into a formalized model of behavior. Because its starting point is the idea of a definition, or framing, of the situation, the theory is called the *Model of Frame Selection* (MFS). The model explains how an actor defines a situation, which program of action he activates, and which action he is willing to perform. These selections are governed by two different mechanisms, depending on how rationally an actor behaves in a certain situation: Either an actor consciously optimizes, as predicted by RCT (reflecting-calculating mode), or he selects without any prior reflection a mentally strongly accessible alternative (automatic-spontaneous mode). The model also specifies the conditions under which behavior will follow one or the other of those different logics, thereby endogenizing an actor's degree of rationality. The basic ideas of the model were firstly formulated by Hartmut Esser (1993; 1996; 2001). The model presented in this article further elaborates and specifies these ideas in order to provide a completely formalized model of action (see already Kroneberg 2005).

In order to illustrate the importance of the definition of the situation and of variable rationality for a general theory of action, the following two sections trace back these ideas to classical sociological concepts of action, present selected experimental evidence, and show that their explanation exceeds the limits of existing theories of action. Thereafter, we develop the MFS and show how it can be applied to explain behavior and to illuminate micro-macro mechanisms.

2. The Definition of the Situation: Experimental Evidence and Theoretical Challenge

One of the most cited and uncontroversial truisms in sociology is that of the Thomas theorem: “If men define a situation as real, it is real in their consequences.” (Thomas and Thomas 1928: 572). It points to the fact that action is grounded in an actor’s *subjective* beliefs and that these thereby manifest themselves as part of social reality, however objectively wrong they may be. Besides this very fundamental interpretation, the Thomas theorem also carries the more special idea of a definition of the situation (see Thomas and Znaniecki 1927: 68-70), which constitutes a typical ingredient of sociological concepts of action. Its starting point is the anthropological fact that human beings depend on some means to drastically reduce a situation’s complexity, i.e. a way to systematize its components into one meaningful order, thereby abstracting from some components as being irrelevant. From this stems the importance of mental models, or schemas, in which the cultural meaning of typical situations is embodied, and which are activated upon entering a situation. *This* idea of a certain definition of the situation as prerequisite to any action resembles the traditional position of normative sociology, as exemplified by Talcott Parsons’ voluntaristic theory of action (1937) and its notion of a “normative orientation” (p. 44) as a necessary condition for every consistent action and social order. It is a central part of the action theories in the Mead-Blumer tradition of Symbolic Interactionism, according to which participants interactively construct the meaning of an undefined situation by sending and interpreting significant symbols.

This classical sociological topic has experienced a revival in connection with the growing research on anomalies of RCT. Under the heading “framing effects”, its importance has been widely acknowledged due mainly to the work of Kahneman and Tversky (Kahneman and Tversky 1979; Tversky and Kahneman 1986). However, their theoretical account – Prospect Theory – is limited to the framing of risky or uncertain alternatives in terms of either gains or losses, although loss and gain frames are only particular instances of possible definitions of situations. Lindenberg (1989) has developed a more general model, which conceptualizes frames as selective goal orientations. However, his discrimination model shares with Prospect Theory the already-mentioned problem of one-sidedness in that they explicitly take RCT as the basis upon which is introduced the “important sociological insight that the definition of the situation matters” (Lindenberg 1989: 194).¹

Empirically, the importance of the definition of situation is demonstrated by a series of newer experiments in which subjects were confronted with social dilemmas like the Prisoner's Dilemma or the Ultimatum Game. These experiments show how explicit situational labels or implicit cues can have a large impact on behavior although the objective game being played remains exactly the same (Kay and Ross 2003; Kay et al. 2004; Larrick and Blount 1997; Liberman, Samuels, and Ross 2004). An especially illustrative case is provided by Liberman, Samuels, and Ross (2004), who explored the effect of two different situational labels on players' responses in a seven-trial Prisoner's Dilemma played face to face (Study 1). Half of the participants played the game under the label "Wall Street Game", the other half under the label "Community Game". The participants received identical instructions except for a pair of verbal references to either the Wall Street Game or the Community Game. They were informed at the beginning that the game would encompass seven rounds and that in every round they would learn their counterpart's move, and thus the respective payoffs, after having specified their own move. It turned out that the name of the game exerted a considerable effect on participants' first-round choices: 71 per cent of the subjects that were confronted with the label "Community Game" cooperated, whereas only 33 per cent of those did so who had been told to play the "Wall Street Game".² Moreover, this pattern remained stable throughout the entire game.

The strong effects of explicit labels – that result from the widely shared connotations surrounding notions like "Community" or "Wall Street" – make the importance of the definition of the situation particularly obvious. However, framing effects influence behavior also in the absence of such significant symbols and sometimes even in largely unconscious ways. For instance, players' behavior varies in objectively identical games depending on whether the respective actions are described as accepting or rejecting a proposal, or as making a claim (Larrick and Blount 1997). As shown by Kay et al. (2004), framing effects can even result from the mere presence of certain material objects. They found that the presence of objects related to business contexts (e.g. a briefcase, as opposed to a black backpack) can have a large effect on choices in the Ultimatum Game. It could also be demonstrated that this impact occurred without any awareness on the part of the subjects via the activation of business-related concepts, thus prompting a corresponding definition of the situation.

Such framing effects are not experimentally construed particularities, but reflections of a basic process underlying *every* action. This can be seen if one considers the part of behavioral game theory that is *not* explicitly concerned with the impact of framing but with the

prediction of behavior in seemingly clear-cut situations like the Ultimatum Game. In this field, a great deal of evidence has been collected which indicates that people generally do not behave like rational egoists, maximizing their material payoffs, but instead also care about equality, fairness, reciprocity, and group membership (Camerer 2003; Gintis 2000). In reaction to this evidence, several models of social preference have been developed which maintain the assumption that players maximize utility (and that this is common knowledge), but construct utility functions that reflect people's others- and process-regarding preferences (Camerer 2003). Some models account for the fact that people often weigh their own material well-being against the "psychic costs" implied by feelings of envy or guilt (Fehr and Schmidt 1999). Other models explain why subjects' responses to the same social allocation differ depending on the *intentions* of those actors that brought it about (Falk, Fehr, and Fischbacher 2003), or why subjects actually do behave like rational egoists if they are divided into different groups and play against members of the other group (Shogren 1989).

With these different models at hand, behavioral game theory has become remarkably successful at explaining behavioral regularities in a variety of experimental games. However, the greater the number of different models of behavior and the more heterogeneous the preferences they are intended to represent, the more urgent becomes the question of under which conditions what kind of model will provide a valid explanation of behavior. This "When" question cannot be answered by simply adding an additional utility function to this family of models because it relates to the process of the *definition of the situation* that seems to *activate* certain utility functions. Models of social preferences fail to provide an answer to this question simply because they treat the experimental situation as an exogenous unanalyzed factor. This fact is nicely summarized by one of the field's leading figures:

"(...) experimental subjects bring their personal history with them into the laboratory. (...) by assigning a novel situation to one of a small number of pre-given *situational contexts*, and then deploying the behavioral repertoire – payoffs, probabilities, and actions – appropriate to that context. We may call this *choosing a frame* for interpreting the experimental situation. This is how subjects bring their history to an experiment." (Gintis 2000: 241)

The models developed in the field of behavioral game theory explain behavior for a *given* utility function (therein following the revealed preferences approach of microeconomic theory). A certain utility function implies that the situation is to a large extent already defined. Thus, this way it is not possible to account for the variation in behavior that is due to the

framing of the situation. In part, this variation concerns intra-individual change in behavior. As Camerer (2003: 117) notes “(...) there are some sociopaths and some saints, but mostly regular folks who are capable of both kinds of behavior.” It remains unclear, however, how models of social preferences can in principle explain why the same person behaves self-interestedly one time while altruistically at another time in exactly the same game depending on variables like the label of the game or even the type of furniture in the laboratory. A *general* theory of action therefore has to go beyond this theoretical framework and requires a systematic treatment of the definition of the situation.

3. Variable Rationality: Experimental Evidence and Theoretical Challenge

The idea that actors exercise different degrees of rationality is also an integral part of classical sociological concepts of action. For instance, Weber’s famous typology of action (Weber 1978) is based on the idea that actors only sometimes execute means-end rational action involving rational consideration of alternative means, consequences and their relative importance, whereas traditional and affectual actions are characterized by the very absence of forward-looking deliberation (Schluchter 1981: 129-131). The same idea is to be found in the theory of everyday behavior by Alfred Schütz (1970), one of the founding fathers of interpretative sociology. This theory states that people usually are well equipped with certain mental models for typical situations, which they use routinely to define situations and act in them. Everyday life proceeds without any rational deliberation as long as there are no hints that the actual situation is different from comparable ones in the past. This flow of habitualized behavior is only interrupted if some unexpected events happen that seriously question the perceived applicability of the unconsciously used mental models of relevance and routine (cf. Garfinkel 1967).

In social psychology, actors’ variable rationality has been demonstrated in numerous experiments conducted in the framework of so-called dual-process theories (Chaiken and Trope 1999). For instance, Sanbonmatsu and Fazio (1990) investigated under what conditions people will make an attitude-based decision as opposed to engaging in an attribute-based, and as such more “rational”, mode of information processing. In their experiment, participants were instructed to form general evaluations of two fictitious stores based on a series of statements describing a variety of the stores’ departments (e.g., clothing, jewelry, camera). The description of one of the stores, Smith’s, was predominantly favorable, whereas the other one, Brown’s, was described in generally unfavorable terms. However, the two sentences

describing each store's camera department contradicted this overall picture, with Brown's, the generally less favorable store, having the better camera department. At a later time in the experiment, participants were asked to imagine that they needed to buy a camera and to indicate at which store they would do so. In this imagined-choice situation, participants could either rely on their general attitude, which would lead them to buy the camera at Smith's, or they could retrieve the specific information about the camera departments from memory, in which case they should be willing to buy at Brown's. By manipulating time pressure and the fear of invalidity, Sanbonmatsu and Fazio (1990) operationalized both the opportunity and the motivation to engage in a deliberative, attribute-based decision strategy.³ In line with their prediction, subjects with *both* the opportunity (no time pressure) and the motivation (high fear of invalidity) for a "rational" decision strategy were significantly more likely to choose the store with the superior camera department than those in the other conditions of the experiment.

In the described experiment, the actors' variable rationality is revealed by the phenomenon that some participants decide rationally, considering the relevant information, whereas others simply follow their general attitudes.⁴ An attitude-based decision can be regarded as a particular instance of a more general class of behavior that deviates from full rationality. Similar kinds of behavior emanate from social norms, habits, routines, or emotional behavioral programs, and their common denominator is to be seen in the fact that actors do not consciously consider all relevant alternatives and possible consequences of their behavior. Instead of making a choice after conscious deliberation, actors act according to a strongly anchored behavioral program.

The observation that actions of this type are characterized by the very absence of a rational cost-benefit calculation is a main source of the criticism RCT encounters in sociology and political science. Starting from the repeated claims that there are "limitations of RCT" (e.g. Bohman 1992; Boudon 1998; Smelser 1992), theoretical accounts have been formulated which aim at a more general theory of human behavior that includes RCT as a special case. This can be said of Herbert Simon's conception of bounded rationality as pattern recognition (1997), Jon Elster's analysis of the various ways in which social norms can guide behavior (1989), Amitai Etzioni's normative-affective and logical-empirical factors (1988), or Viktor Vanberg's distinction between rational choice and program-based behavior (2002). Since it is beyond the scope of this article to discuss even those selected approaches, it must suffice to note that they are successful in formulating a more general account of human behavior, but at

the cost of sacrificing formalization. The latter fact may explain why these approaches have not replaced RCT, although this should be expected from a more general theory.

However, there is no need to assume that formal theorizing would be restricted to RCT and that program-based spontaneous action cannot in principle be formalized. In fact, building on the seminal work of Herbert Simon on bounded rationality, many efforts have been made at the interface of economics and sociology to develop models of behavior that precisely formalize the notions of bounded rationality or adaptive decision-making (Gigerenzer and Selten 2002). One such family of models is part of the theories of learning in games (see Camerer 2003). Take, for example, the stochastic learning model proposed by Macy (1991). Its explicit aim is to relax “the assumption that actors appreciate the strategic implications of future interaction” and to model instead a backward-looking adaptive behavior that can rely on “(...) rote decision rules, unthinking habits and routines, and internalized norms.” (Macy 1991: 813). To specify these ideas, the model assumes that behavioral propensities are simply attenuated or reinforced depending on past payoffs, without any further systematic information processing.

Although such kinds of models without a doubt constitute important contributions to the social scientist’s toolbox, they lead to the same problem of domain restriction as the models reviewed in the previous section. Indeed, the methodological problem is much more severe in this case because – in contrast to different arguments entering an actor’s utility function – the very theory of action is said to have a limited scope of application. So again, a general theory of action has to provide an answer to the “When” question: “When do people behave based on forward-looking rationality, and when do they instead unconditionally follow internalized rules or respond immediately to situational influences?” Thus, it becomes crucial to know what kind of individual and situational factors determine the rationality an actor exhibits.

To sum up, with regard to both phenomena there are two types of theoretical accounts: first, precisely formulated models that are of limited explanatory scope and give no answer to the question when they are appropriate, and second, approaches that possess the required generality but lack formalization, and thus offer no competitive alternatives to RCT. Consequently, both the definition of the situation and variable rationality still await a precise treatment within a formalized model of action, although it has been indisputably demonstrated that they constitute significant phenomena underlying human behavior. Moreover, a thorough theoretical account would also have to consider the several ways in which both phenomena are linked in producing behavior. For instance, the definition of the situation itself can occur

more or less rationally, and the effect of a certain definition of the situation can be expected to be strongest if the people behave automatically without consciously considering all potentially relevant alternatives and incentives. The Model of Frame Selection aims to provide such an comprehensive account.

4. The Model of Frame Selection

4.1 Theoretical Background and Basic Assumptions

As has been shown, the main ideas of the definition of the situation and variable rationality are already part of classical sociological concepts of action. The more immediate background of our theory, however, is provided by theoretical concepts and empirical insights gained from cognitive social psychology and cultural anthropology (see already DiMaggio 1997). Of central importance is the concept of a schema, or mental model, which can be defined as “a mental structure which contains general expectations and knowledge of the world. This may include general expectations about people, social roles, events and how to behave in certain situations” (Augoustinos and Walker 1995: 32). For example, take the cultural meaning attached to the notion of honor or principles of fairness. These schemas consist of interconnected units such as types of behavior that are regarded as an offense against one’s honor or a breaking of fairness rules. To the extent that mental models are shared within particular social contexts, they represent individual manifestations of the culture of this social sphere and are thus called *cultural* models (D’Andrade 1995).

The Model of Frame Selection (MFS) knows two types of mental models. *Frames* are mental models of situations, while *scripts* are mental models of sequences of actions (see Moskowitz 2005: 162-163).⁵ Both equip an individual with pre-fabricated answers to critical questions he might raise when facing a particular situation. Frames answer the questions, “What’s going on here?”, or “What kind of situation is this?” (Goffman 1974). Thus the frame that an actor activates constitutes his definition of the situation. Because an actor can interpret a given situation in many ways, the process of activating a particular frame is termed *frame selection*. How the actor defines a situation is always determined by certain situational objects that signal the appropriateness of a frame in a given situation. These objects can function as significant symbols because they are encoded as part of the mental model of the situation, e.g. the frame “hospital” contains among other things certain work clothes and manners of

behavior. Notably, the meaning of these situational objects is socially constructed and therefore might change, e.g. in the course of negotiations about meaning (Wimmer 2002). Furthermore, it is in the form of situational objects in which a culture's supra-individual character – as systems of symbols – affects actors' definitions of the situation (DiMaggio 1997: 272-274). For example, frames might be evoked through conversation, the use of media, or the way other individuals act. The definition of the situation affects behavior because certain knowledge structures, situational goals, values, and emotions are activated once the situation is defined according to a certain frame. Moreover, after the situation has been defined, many objectively existing courses of action might well lie beyond the horizon of meaningful action, leading to a first shrinkage of the set of alternatives.

For most situations actors even possess programs of action or scripts that answer the question, “How am I expected to behave?” Depending on the type of situation, a script may relate only to individual behavior (e.g. angling) or to timely and substantially ordered sequences of action (e.g. participating in a service). The term “script” is designed to encompass such divergent phenomena as different kinds of norms, conventions, routines, habits, and emotional reaction schemes (see Elster 1989: 100-105). Searching for the appropriate kind of action within a defined situation, the actor is again confronted with several alternatives – at least from an objective point of view: “The number and variety of alternative rules assure that one of the primary factors affecting behavior is the process by which some of those rules, rather than others, are evoked in a particular situation.” (March and Olsen 1989: 24). Since scripts are always specific to certain types of situations, the activation of a script, or *script selection*, occurs after the situation has been defined in the process of frame selection.

After the frame and script selection, an actor might finally raise the question, “What am I going to do?”, this third selection being called *action selection*. It is this selection on which RCT and other theories of action typically exclusively focus. By independently focusing also on the preceding activation of a frame and a script, the MFS takes into consideration the often large extent to which behavior is structured by mental models – a phenomenon we were above somewhat loosely referring to as “the definition of the situation”.

Acknowledging actors' variable rationality, the MFS assumes that the frame, script, and action selections can each occur more or less consciously, resulting in different degrees of elaboration. These are called *modes of information processing* during the selection or, more concisely, the *mode* of selection. For the sake of simplicity and adhering to the distinction between “automatic” and “controlled” processes in psychology, the MFS incorporates just

two extreme modes of selection: an automatic-spontaneous mode (as-mode) and a reflecting-calculating mode (rc-mode).⁶ The rc-mode represents a conscious *choice* in which possible consequences and their probabilities of occurrence are processed in a systematic manner. In this mode actors show the maximizing (or satisficing) behavior assumed in the framework(s) of RCT. Contrary to this, the as-mode stands for a definite selection of one particular taken-for-granted alternative. A selection in the as-mode is based solely on the accessibility of mental models and immediate situational influences, and it frees the actor from having to scrutinize competing alternatives (cf. Fiske and Neuberg 1990).

By incorporating these two modes of selection, the MFS captures actors' variable rationality.⁷ In order to move beyond mere conceptual distinctions and to make use of the explanatory power of the idea of variable rationality, the MFS also explains *under which conditions* a specific mode governs a selection. The starting point is again the idea that the employment of a certain mode of information processing can be thought of as the outcome of a selection. The so-called *mode selections* determine whether the frame, script, and action selections occur automatically (in the as-mode) or reflecting-calculating (in the rc-mode).

In cognitive social psychology the determinants of these meta-selections have been addressed in numerous experiments out of which has grown a family of theories known as dual-process theories (Chaiken and Trope 1999). Despite certain differences in terminology and substance, the majority of dual-process theories agree upon the importance of four variables: opportunities, motivation, effort, and accessibility. With regard to the first two variables, a deliberating or "rational" mode of information processing becomes more likely, the less it is hampered by restrictions, e.g. in time or capabilities, (*opportunities*), and the higher the costs of a wrong decision (*motivation*) are (e.g. Fazio 1990). Actors need this extra motivation to engage in a rational mode of selection because this more elaborated mode inevitably causes reflection costs in the form of forgone time and energy (*effort*).⁸ Finally, automatic-spontaneous selections depend on the *accessibility* of appropriate ready-to-use programs. This fourth variable is of particular theoretical importance because it directly links the idea of the definition of the situation to that of variable rationality: Both phenomena are grounded in actors' mental models, i.e. their frames and scripts. Moreover, the four determinants of the mode selections are directly influenced by the presence of certain situational objects; hence, both phenomena depend on characteristics of the external situation.

Thus, social psychological research has not only empirically confirmed the phenomenon of variable rationality but has also yielded theoretical knowledge about the factors influencing actors' degree of rationality. Lacking, however, is a formalized model of the underlying

processes which precisely explains the *interplay* of these variables. The MFS tries to solve this problem by translating the insights of dual-process theories into a formalized decision-theoretical framework. However, it is not the first model to attempt to explain actors' degree of rationality as the outcome of a meta-selection. In economics, theories of information costs (beginning with Stigler 1961) postulate that people will invest in information processing until marginal utility equals marginal costs, and the model by Heiner (1983) focuses on the expectation that a more encompassing consideration of information will improve performance under conditions of uncertainty. Noticeably, the variables used by these accounts – expectations, utilities, and costs – are very similar to the factors identified in social psychological research: opportunities, motivation, and effort. However, having remained too closely attached to the familiar conceptual apparatus, none of the economic models has paid due attention to the accessibility of mental models and, in general, to the processes by which they guide behavior.

The processes encompassed by the MFS are depicted in Figure 1. The relations between the different selections symbolized by the arrows will be explained in the following paragraphs, as will the way in which these selections are embedded within social situations and processes. Because it already becomes apparent that the proposed model of action is relatively complex, it should be emphasized that this constitutes just the full set of processes that can be studied. In applications, it is possible, and often sufficient, to consider extremely simplified versions of the model.

Now that the grounds for its understanding have been laid, the subsequent paragraphs develop the MFS in two steps. First, the processes of the definition of the situation (frame selection), activation of a program of action (script selection), and building of a behavioral intention (action selection) are formalized, differentiating between an automatic-spontaneous and a reflecting-calculating mode of selection. In the second step, the mode selections *determining* whether the as- or the rc-mode prevails are derived.

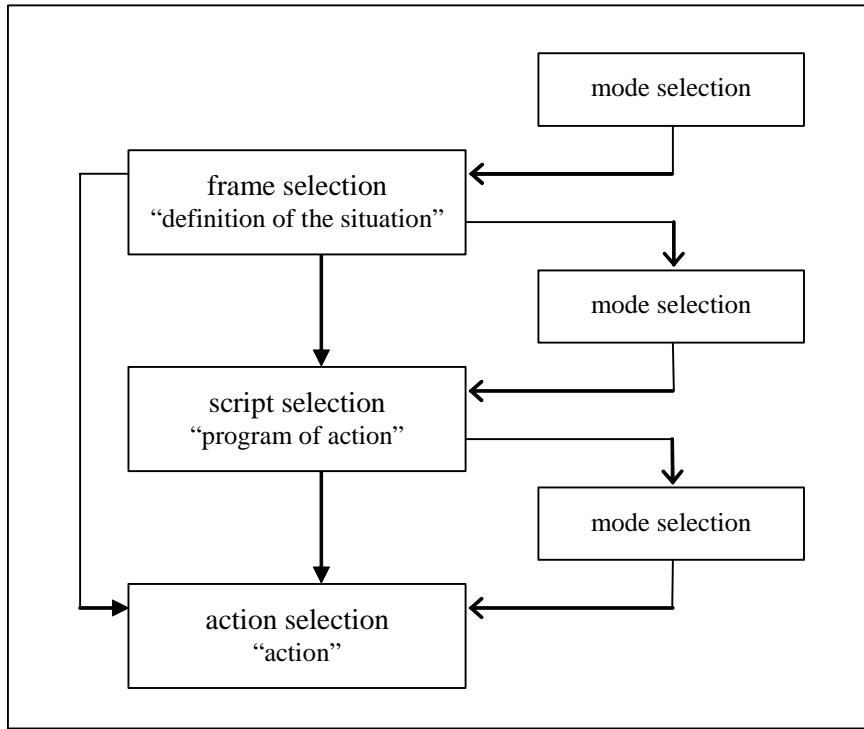


Figure 1: The mental processes used in the Model of Frame Selection to explain action

4.2 Frame-, Script-, and Action Selection

Denote by F the set of available frames $F = \{F_1, \dots, F_N\}$, by S the set of available scripts $S = \{S_1, \dots, S_M\}$, and by A the set of behavioral alternatives $A = \{A_1, \dots, A_K\}$. Firstly, we look at the frame, script, and action selections when they occur in the *rc-mode*. If the frame selection or the script selection takes place in the *rc-mode*, the actor will consciously choose the alternative i with the highest subjective expected utility (SEU):

$$SEU(F_i) > SEU(F_j) \quad \text{for all } j \in F, j \neq i \quad \text{or} \quad (1a)$$

$$SEU(S_i) > SEU(S_j) \quad \text{for all } j \in S, j \neq i \quad \text{respectively.} \quad (1b)$$

Because it is so elementary to the success of subsequent actions that these rely on a valid definition of the situation and identification of the socially expected line of behavior, the frame and script selections usually follow a “logic of appropriateness” (March and Olsen 1989). This means that actors are motivated to focus solely on identifying the most *appropriate* alternative (Lindenberg 1989: 178). The more specific wants and interests reflected in this general goal typically have become so self-evident that they mostly remain in the implicit background of everyday behavior. Thus, in the *rc-mode* the frames or scripts

differ mainly with respect to the *expectation* to define the situation appropriately or to identify the appropriate line of action. Instead of weighing costs and benefits, actors elaborate on the expectation that the alternative is appropriate; thus their selection has to be explained with regard to the “good reasons” they come to find (Boudon 1996). Because the evaluated consequence (i.e. the selection of an appropriate alternative) is constant over the range of alternatives, the instrumental nature of the choice is not obvious, even to the actors themselves. However, there is no reason why this kind of “cognitive rationality” cannot be *formally* represented within the framework of SEU theory (as is argued by Boudon 1996; and March and Olsen 1989). The perceived plausibility of frames and scripts simply corresponds to different values of an expectation parameter, with the utility term being fixed at a certain value. Moreover, the advantage of SEU theory is that it can also integrate other cases in which an actor’s seemingly impartial and normative reflections are influenced by his self-interest (see Elster 1989: 125-128). Thus, in the end, it can be left to empirical analysis which consequences an actor takes into consideration and how he evaluates them.

The *action selection* in the rc-mode differs qualitatively from the two previous selections in that it results in overt behavior. As such, its consequences lie to a certain extent beyond the actor’s control, and it is thus more important to take into account the possible dynamics an action may trigger. Therefore, an actor typically will explicitly consider *different specific* consequences and their evaluation (in contrast to the typical logic of the preceding frame and script selections). When it comes to explaining the outcome of this evaluating calculus, rational choice theories are especially powerful. For the social sciences, a particularly interesting possibility is that an actor conditions his behavior on the likely actions of others, anticipating that they will reason in the same strategic way. In such cases, rational action corresponds to more complex rules of decision-making such as the solution concepts developed within game theory. Consequently, SEU theory is only a special case of action selection in the rc-mode, and every other form of rational action is also possible (e.g. that implied by a Nash Equilibrium):

$$SEU(A_i) > SEU(A_j) \quad \text{for all } j \in A, j \neq i \quad \text{or any other form of rational action.} \quad (1c)$$

In the MFS, the rc-mode is formalized by utilizing RCT; indeed, the purpose of this part of the model is to incorporate the forward-looking conceptions of rationality developed within RCT as a special case of a more general theory of action. However, the *additional* explanatory power of the MFS lies in the possibility it affords to *systematically* incorporate influences of the definition of the situation on rational action (see Figure 3). By this means, one can elaborate on a largely implicit assumption of current rational choice theories, namely that

utility functions (i.e. an actor's goals and their salience) vary depending on the selected frame and the corresponding value orientations and emotions (cf. Etzioni 1988: 96-100; cf. Lindenberg 1989). In this respect, frames can be regarded as cultural structures that are "resources for seeing interests" (Rambo 1999: 337), and the definition of the situation therefore both enables and constraints rational action.

The *as-mode* corresponds to a completely different "logic of selection". Here it is not possible to rely on existing formal models that are already established in social science research. However, the conceptualization of the *as-mode* as a type of selection that is based on immediate situational perceptions and the resulting activation of mentally accessible schemas lends itself quite neatly to formalization. Remember that a schema can be regarded as "a pattern of interaction among strongly interconnected units" (Strauss and Quinn 1997: 52). This is exactly the definition employed in connectionist computer models designed to simulate human knowledge, learning, and action. Of course, the incorporation of a full-fledged connectionist model would inevitably distort the analytical tractability of a general theory of action that is, after all, designed to explain *social* phenomena (rather than to simulate the brain). The principle logic of connectionism, however, can be fruitfully exploited by viewing frames and scripts as units in a network of learned associations. As Strauss and Quinn (1997: 52) describe:

"These networks process information holistically. An event activates all the units that respond to the features of that event; these units, in turn, then activate all the others to which they are strongly linked by associations learned from past experience, exciting some units and inhibiting others".

This process of automatic pattern recognition and schema activation corresponds to the notions developed by Simon, Vanberg and others. Its sociological dimension becomes evident if one recognizes that "a unit of a mental network" is a very abstract construct that can be translated into familiar concepts such as roles, stereotypes, values, norms, or routines.

Highlighting the substantial difference from a conscious choice, the MFS adopts a different terminology in describing the *as-mode*: Whereas in the *rc-mode* the alternative with the highest SEU weight was chosen, in the *as-mode* the alternative with the highest *activation weight* (AW) is selected. The determinants of the activation weight have to be further specified for the three selections of a frame, a script, and an action.

The *frame selection* in the as-mode is determined solely by the immediately experienced *matches* between the frames and the objective situation. The match of a frame is high if an actor clearly perceives certain situational objects, if these constitute significant symbols for a certain type of situation, and if the corresponding frame is mentally strongly accessible (Esser 1996: 19; 2001: 270). Thus, the match of a frame F_i is a function of

- the mental accessibility of the frame ($a_i \in [0,1]$),
- the presence of situational objects that are significant for the frame ($o_i \in [0,1]$), and
- the strength of the mental connection between the objects and the frame ($l_i \in [0,1]$).

The match m_i is the product of those factors, yielding an activation weight of

$$AW(F_i) = m_i = a_i \cdot l_i \cdot o_i. \quad (2a)$$

It is assumed that the definition of the situation in the as-mode depends solely on the matches of the different frames, so that the frame with the highest match to the situation will be selected:

$$m_i > m_j \quad \text{for all } j \in F, j \neq i \quad (2b)$$

Thus, in marked contrast to forward-looking rationality, the definition of the situation in the as-mode is based entirely on stored knowledge structures and immediate situational stimuli. Noteworthy, the simple concept of the match provides an analytical tool to study *social* framing processes. For example, the mobilization of social movements depends to a large extent on the way in which different actors interactively construct a shared meaning of the movement's concerns and goals. Paralleling the components of the match, students of social movements argue that those "collective action frames" are likely to become widely adopted that are both credible and salient (Benford and Snow 2000: 619-622).

Figure 2 provides a schematic representation of the factors determining the selections in the as-mode. Thus far, the first three parameters – reading from left to right – have been introduced.

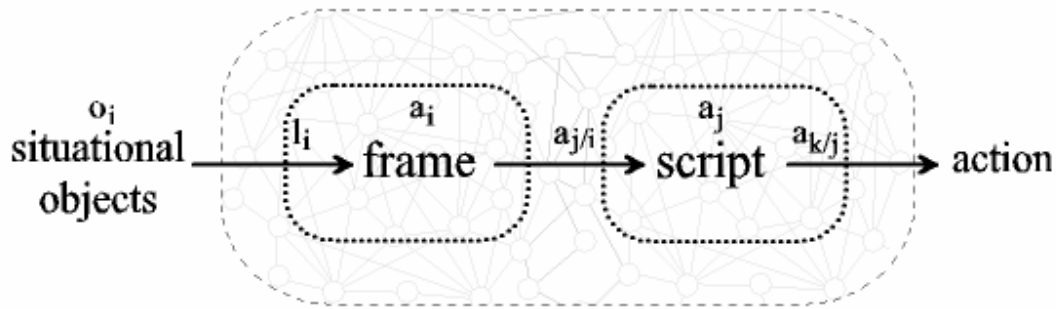


Figure 2: The determinants of the frame, script, and action selections in the as-mode

Should the *script selection* occur in the as-mode – subsequent to a certain definition of the situation (frame F_i) –, the model assumes that there will be greater activation of a script S_j

- the higher its general availability ($a_j \in [0,1]$),
- the higher its accessibility given the selection of frame F_i ($a_{ji} \in [0,1]$), and
- the higher the match of the selected frame ($m_i \in [0,1]$).

The *general availability* of the script (a_j) represents how strongly it is mentally anchored, e.g. how strongly an actor has internalized certain norms or become accustomed to certain routines. Besides this, a typical feature of behavioral rules is that they apply only under more or less specified conditions (Hechter and Opp 2001). In the model, this conditionality is reflected by the fact that a script is more or less *accessible* (a_{ji}) depending on the preceding definition of the situation. In connectionist terms, this accessibility represents the varying degree of mental association between frames and scripts (see Figure 4). Both parameters are, of course, actor-specific attributes insofar as they refer to actors' personal convictions, whose conformity to social expectations can vary.

As already implied by the accessibility of a script, certain sequences of actions are more or less expected, depending on the kind of situation. For this reason, the model goes on to assume that the degree to which a script is activated also depends on how unequivocally the frame F_i was selected: The higher the match (m_i) of the selected frame, the higher is the activation of scripts corresponding to this definition of the situation. This is why the activation weights of *all* scripts decrease with a less-than-perfect match of the selected frame.⁹

In this context, it is important to notice that the match of the selected frame may have changed in the course of the frame selection if it occurred in the rc-mode. Actually, this is quite probable, because in this case the actor has systematically analyzed the situation while

trying to identify the objectively matching frame. This consciously built expectation then corresponds to a new value of the match m_i .

Putting together these parameters, the activation weight of a script S_j in the as-mode – given a definition of the situation according to frame F_i – is equal to

$$AW(S_j|F_i) = a_j \cdot a_{ji} \cdot m_i \quad (3a)$$

and the script with the highest activation weight will be selected:

$$AW(S_j|F_i) > AW(S_k|F_i) \quad \text{for all } k \in S, k \neq j \quad (3b)$$

The parameters are multiplicatively linked because in a defined situation, a script relating to a completely different type of situation (accessibility $a_{ji} = 0$) should by no means be selected, *independent* of how strongly it is mentally anchored in general (availability a_j).

Scripts are mental models of (sequences of) actions, thus they are directly relevant for the process of *action selection*. This is even more so if action takes place in the as-mode, since here an actor can rely only on a prefabricated model of action, i.e. an antecedently selected script. Thus, in the as-mode there is no alternative to the script-based course of action. Regarding the determinants of the action selection, it is reasonable to assume that an actor will be more reluctant to act according to the selected script if he is quite unsure about what kind of situation he is facing or which action is regarded as appropriate behavior. Thus, the activation weights of all actions depend on the frame's match and on the other components of the script's activation weight. But even a completely unequivocal script selection ($AW(S_j|F_i) = 1$) does not necessarily lead to an action in conformity with the script. That is because scripts seldom regulate in an encompassing and unambiguous way all the potential behavioral choices an actor faces in a certain situation. Thus, the action selection in the as-mode is influenced by yet another factor: the degree to which the script S_j regulates a certain action A_k ($a_{kj} \in [0,1]$). If a script is incomplete with regard to a certain behavioral choice ($a_{kj} = 0$), an automatic-spontaneous action is impossible. Therefore, the activation weight of an action A_k in the as-mode equals

$$AW(A_k|S_j) = a_{kj} \cdot AW(S_j|F_i) \quad (4a)$$

and the action with the highest activation weight will be selected:

$$AW(A_k|S_j) > AW(A_i|S_j) \quad \text{for all } i \in K, i \neq k \quad (4b)$$

Given a clear definition of the situation and a corresponding mentally strongly anchored script that sufficiently regulates the behavioral choice, the activation weight of the scriptconforming action is very high – as in the case of everyday routines or emotional reactions.¹⁰

To sum up, the definition of the situation, the activation of a program of action, and action itself each can follow two different logics of selection, thereby capturing the phenomenon of *variable rationality*. In the rc-mode an actor behaves like the forward-looking utility maximizer assumed by rational choice theories, whereas in the as-mode he selects a certain alternative based on stored knowledge structures and immediate situational stimuli *without* considering other alternatives or incentives (see Table 1).

Table 1: Frame, script, and action selections in the Model of Frame Selection

Process	Alternatives	Alternatives' selection weights in the	
		as-mode	rc-mode
definition of the situation	frames F_i	$AW(F_i) = m_i = a_i \cdot l_i \cdot o_i$	$SEU(F_i)$
activation of behavioral programs	scripts S_j	$AW(S_j F_i) = a_j \cdot a_{ji} \cdot m_i$	$SEU(S_j F_i)$
action selection	actions A_k	$AW(A_k S_j) = a_{kj} \cdot AW(S_j F_i)$ $= a_{kj} \cdot a_j \cdot a_{ji} \cdot m_i$	$SEU(A_k S_j)$

m_i = match of frame i , a_i = mental accessibility of frame i , o_i = presence of situational objects that are significant for frame i , l_i = strength of mental connection between the objects and frame i , a_j = general availability of script j , a_{ji} = accessibility of script j given frame i , a_{kj} = degree to which script j regulates action k . All four parameters lie in the unit interval $[0,1]$. In the as-mode, selection weights add up to 1.

4.3 The Mode Selections

As numerous experiments in cognitive social psychology reveal, the mode of information processing is an important determinant of behavior, lending confirmation to classical sociological concepts of action that already emphasized the idea of variable rationality. In the previous section, a reflecting-calculating and an automatic-spontaneous mode were formalized in order to give this notion a precise meaning within an explanatory model of action. However, if the mode can have a considerable effect on the processes of frame, script, and action selections, then their explanation requires knowledge of the *conditions under which* a selection is likely to be governed by one or the other mode. In its answer to this “When” question, the Model of Frame Selection (MFS) relies heavily on experimental and theoretical work in social psychology (Chaiken and Trope 1999; Fazio 1990).

In order to integrate those substantial insights into a *formal* model of action, however, one has to go beyond these verbal accounts. To this aim, the process determining the mode – the mode selection – is formalized in *analogy* to a subjectively rational decision. Substantially, however, the mode selection is an *unconscious* process that determines whether or not an actor assigns attention to an issue. As such, it is by no means forward-looking, and SEU theory is thus employed only for the sake of precision (similarly Heiner 1983).

For each substantial selection – the frame, script, and action selections – there is one corresponding mode selection (see Figure 3). However, with the exception of one parameter, the mode selection is formally identical for the frame, script, and action selections. Thus, for the sake of simplicity, the subsequent derivation will be restricted to the mode selection that precedes the *frame selection*.

The mode selection determines whether or not the actor also subjectively faces a choice problem, or instead spontaneously activates the alternative with the highest activation weight. Thus, the alternatives of the mode selection are the rc-mode and the as-mode of information processing. In order to give the mode selection a decision-theoretical formalization, we have to specify the expected payoffs associated with each of these alternatives. Grossly speaking, these payoffs depend on the accuracy and the effort that result from employing a certain mode of selection. As we already know, the rc-mode represents the more accurate, but also the more effortful alternative. Therefore, whether or not it pays to rely on this more elaborated mode of selection depends on two states of the world that relate to its feasibility and necessity:

- Whether or not sufficient opportunities for reflection exist, and
- whether or not the frame that is mentally directly accessible is indeed optimal.

Combining these states of the world yields four possible events. Crosstabulating them with the two alternatives, we can construct a decision matrix for the mode selection, as depicted in Table 2 (cf. Savage 1954). Because the mode selection is formalized analogous to a maximization of subjective expected utility, the next step is to define for both states of the world the *subjective* probabilities of occurrence. These are the *perceived* opportunities for reflection ($p \in [0,1]$) and the *subjective* probability that the alternative which can be automatically selected is truly optimal. The alternative that is immediately accessible upon perception of the situation corresponds to the alternative with the highest activation weight in the as-mode ($AW(F_i) \in [0,1]$). Thus, if we denote the frame with the highest match to the situation as F_i , the subjective probability that the alternative which can be automatically

selected is truly optimal can be defined as this frame's match m_i . Correspondingly, $(1 - m_i)$ can be interpreted as the leeway remaining for alternative frames that instead might be valid.

Assuming that the two states of the world are independent of each other, the subjective probability that sufficient opportunities for reflection exist *and* that indeed an alternative frame is valid, equals the product of the respective probabilities: $p \cdot (1 - m_i)$. In the same way, the subjective probabilities of occurrence for the other events can be derived (see Table 2).

Table 2: The decision matrix of the mode selection (corresponding to the frame selection)

Alternatives	States of the world with subjective probabilities of occurrence			
	Sufficient opp. for reflection; F_i valid $p \cdot m_i$	Sufficient opp. for reflection; F_j valid $p \cdot (1 - m_i)$	Insufficient opp. for reflection; F_i valid $(1 - p) \cdot m_i$	Insufficient opp. for reflection; F_j valid $(1 - p) \cdot (1 - m_i)$
rc-mode	$U_i - C$	$U_{rc} - C$	$U_i - C$	$-C_w - C$
as-mode	U_i	$-C_w$	U_i	$-C_w$

p = opportunities for reflection, m_i = match of frame i , U_i = utility associated with frame i , U_{rc} = utility associated with the rc-mode, C = costs associated with the rc-mode, C_w = costs associated with a wrong selection. All parameters are subjective parameters whose values result solely from directly perceived attributes of the situation and the actor's learning history.

Having defined the alternatives, states of the world, and subjective probabilities of occurrence, we can now derive the payoffs, which depend on both the selected mode and the event occurring. These utilities and costs are mentally accessible information that have been encoded in the past and are activated unconsciously upon perceiving certain situational objects (see below).

In the *as-mode* the actor defines the situation according to the frame F_i that has the highest activation weight. If this frame is objectively valid, he can expect a payoff U_i that is mentally associated with this frame. If it is not valid, the selection in the as-mode will lead to an objectively wrong definition of the situation, which is associated with costs C_w .

The *rc-mode* inevitably brings about reflection costs C in the form of time (opportunity costs) and energy. However, the greater effort is accompanied not only by higher costs but also by greater validity: Should there be sufficient opportunities for reflection, the rc-mode will lead to a correct definition of the situation. This results in a payoff of U_i if the frame F_i is valid, and in a payoff of U_{rc} if the actor discovers that some alternative frame is valid. If the

reflection fails because there are insufficient opportunities, the actor will be left with the frame F_i and the same payoffs as in the as-mode, minus reflection costs C .

Adding up the expected payoffs for each of the two modes, the decision matrix results in the following SEU weights:

$$SEU(as) = m_i U_i - (1 - m_i) C_w \quad (5a)$$

$$SEU(rc) = p(1 - m_i) U_{rc} + (1 - p)(1 - m_i)(-C_w) + m_i U_i - C \quad (5b)$$

Given the decision rule that the alternative with the highest subjective expected utility will be chosen, the rc-mode will be selected if, and only if, $SEU(rc)$ is higher than $SEU(as)$, which is equivalent to the following condition:

$$p(1 - m_i)(U_{rc} + C_w) > C \quad (6)$$

The interpretation of this inequality is simple: An actor selects (in) the rc-mode if, and only if, compared to an automatic-spontaneous selection the additional utility of this mental activity exceeds its additional costs. The interpretation of the left side as an additional utility is as follows: If sufficient opportunities exist (p), and if the frame with the highest activation weight is *not* valid ($1 - m_i$), only the selection of the rc-mode will bring about the utility of an appropriate definition of the situation (U_{rc}) and avoid the costs of an inappropriate one (C_w).

Thus, the sum ($U_{rc} + C_w$) represents the costs of a wrong decision in the as-mode, and this corresponds exactly to the notions of “motivation”, “perceived costliness of a judgemental mistake” or “fear of invalidity” as put forward by dual-process theories (Fazio 1990: 92). In other respects as well, the decision-theoretic formalization reproduces the insights of cognitive social psychology: Actors make use of a more elaborated but also more strenuous mode of information processing the higher the stakes, the more ambiguous the situation, the more favorable the opportunities for reflection, and the lower its costs are.

These results are directly transferable to the mode selections preceding the script and action selection. One has only to replace the match m_i by the corresponding highest activation weights $AW(S_j|F_i)$ and $AW(A_k|S_j)$ in equations (5a), (5b), and (6).

A further derivation that is of high significance for empirical applications (see below) results if one considers not the condition for the rc-mode, but conversely the condition for the as-mode. Solving $SEU(as) \geq SEU(rc)$ for the highest activation weight, one gets the following three conditions that correspond to the frame, script, and action selections:

$$m_i \geq 1 - C/p(U_{rc} + C_w) \quad (6a)$$

$$AW(S_j|F_i) \geq 1 - C/p(U_{rc} + C_w) \quad (6b)$$

$$AW(A_k|S_j) \geq 1 - C/p(U_{rc} + C_w) \quad (6c)$$

These inequations entail the same information as the condition for reflection (5). Looking only at their left sides, one can see that the requirements for remaining within the automatic-spontaneous mode increase *ceteris paribus* from one stage to the other. A frame selection in the as-mode requires that the situational objects signal relatively clearly the validity of a certain frame (6a). In order for the script selection to occur automatically, it is *additionally* necessary that the actor possess a script which fits to the definition of the situation and is mentally strongly accessible (6b; see equation (2)). Finally, an action selection made in the as-mode rests on the additional requirement that the script clearly state which alternative should be chosen (6c; see equation (3)).

To properly understand the MFS, it is important to note that a mode selection is intended to describe an unconscious process. Consequently, the values of all parameters are not (and cannot be) products of deliberate thought but instead reflect mentally encoded experiences and directly perceived properties of the situation.¹¹ For example, the utility U_i associated with the frame i is based on the earlier emotional experiences an actor has made in this type of situation (see Strauss and Quinn 1997). Also based on past experiences, certain situational objects signal how far sufficient opportunities for reflection (p) exist, how far reflection might be valuable (U_{rc}) and costly (C), and how far a wrong selection can lead to costs (C_w).

As an illustrative example, imagine a nobleman in 19th-century Europe who is affronted by a peer (see Kroneberg 2005). Should this take place before an assembly of other peers, the reflection costs (C) will be relatively high, because in that era to hesitate was regarded as indicative of a lack of sense of honor. Being well socialized into the group's code of honor, this knowledge becomes *immediately* relevant without the actor having to be aware of this influence. Moreover, if the actor is attacked verbally within a conversation, there typically is hardly any time to reflect on the optimal reaction (low perceived opportunities for reflection p). Both factors make it more likely that the actor will select the as-mode and thus conform spontaneously to the code of honor – a script that required noblemen to avenge supposed slights on their honor by challenging the offender to a duel.¹²

4.4 A Formal Summary

Once all components of the MFS have been formalized, they can be connected, yielding a full statement of the model (cf. Figure 1). Let S_F , S_S , and S_A denote the selection sets of the frame, script, and action selections. Each of them contains exactly one element: the selected frame, the selected script, or the selected behavioral alternative. The logic of these selections depends on the preceding mode selections:

frame selection:

$$S_F = \{F_i \in \{F_1, \dots, F_N\} \mid \begin{cases} m_i > m_j & \text{iff } \text{SEU}(\text{as}) \geq \text{SEU}(\text{rc}) \\ \text{SEU}(F_i) > \text{SEU}(F_j) & \text{iff } \text{SEU}(\text{as}) < \text{SEU}(\text{rc}) \end{cases} \text{ for all } j \in N, j \neq i\}$$

script selection:

$$S_S = \{S_j \in \{S_1, \dots, S_M\} \mid \begin{cases} \text{AW}(S_j|F_i) > \text{AW}(S_k|F_i) & \text{iff } \text{SEU}(\text{as}) \geq \text{SEU}(\text{rc}) \\ \text{SEU}(S_j) > \text{SEU}(S_k) & \text{iff } \text{SEU}(\text{as}) < \text{SEU}(\text{rc}) \end{cases} \text{ for all } k \in M, k \neq j\}$$

action selection:

$$S_A = \{A_k \in \{A_1, \dots, A_L\} \mid \begin{cases} \text{AW}(A_k|S_j) > \text{AW}(A_i|S_j) & \text{iff } \text{SEU}(\text{as}) \geq \text{SEU}(\text{rc}) \\ \text{SEU}(A_k) > \text{SEU}(A_i) & \text{iff } \text{SEU}(\text{as}) < \text{SEU}(\text{rc}) \end{cases} \text{ for all } i \in L, i \neq k\}$$

For purposes of illustration, we again restrict ourselves to the frame selection. Upon entering a situation, the actor has to define it by selecting a frame F_i out of the set of cognitively accessible frames $\{F_1, \dots, F_N\}$. If a frame fits to the situation relatively clearly ($\text{SEU}(\text{as}) \geq \text{SEU}(\text{rc})$), the actor will define the situation in the as-mode, i.e. he will select the frame that immediately comes to his mind upon perceiving the respective situational objects (m_i). However, if there is no such clear match and if reflection seems to be possible and valuable, the rc-mode will be activated ($\text{SEU}(\text{as}) < \text{SEU}(\text{rc})$). In this case, the actor will analyze the situation consciously, choosing the frame that has the maximum subjective expected utility ($\text{SEU}(F_i)$). The same principles apply to the script and action selections. Again, the match has only to be supplemented with additional parameters relating to an actor's scripts (see equations (3a) and (4a)).

5. Applications

The Model of Frame Selection (MFS) constitutes an analytically competitive alternative to RCT insofar as it precisely formalizes the selective processes underlying behavior. By viewing rational choice as a certain mode of information processing, it includes RCT as a special case, thereby providing a more general analytical framework.

The rest of the article is devoted to illustrating how the MFS can be applied. Using Coleman's (1986) well-known macro-micro-macro-model as a guiding scheme, we look successively at two ways in which the MFS can be used in sociological explanations (Hedström and Swedberg 1998: 21-23). We first show how the MFS can be directly applied as an *action-formation mechanism*, shedding light on the limitations of RCT and yielding more encompassing and statistically testable explanations of behavior (5.1). This micro-micro step constitutes the natural place for a theory of action that explains how a combination of individual parameters leads to a specific behavior. However, because sociology is ultimately concerned with collective phenomena, it is of utmost importance that a theory of action also provide a basis for modeling micro-macro, or *transformational mechanisms* that explain how social phenomena emerge from interaction processes between several actors (Coleman 1990; Lindenberg 1992). Thus, we will also sketch how the MFS might offer new possibilities for modeling such mechanisms (5.2).¹³

5.1 The “Unconditionality” of Action and the Conditions for Rational Choice

The main advantage of the MFS is to be seen in the possibility to adequately incorporate basic insights from sociological concepts of action. Above all, this is accomplished by formalizing an automatic-spontaneous mode of information processing in which an actor definitely selects a mentally strongly accessible alternative without even considering other alternatives. The MFS thereby takes up the main point put forward by opponents of RCT as a *universal* theory of human behavior: namely, that behavior sometimes emanates in a spontaneous-automatic manner and is thus characterized by the very absence of a rational cost-benefit calculation. Typically, such a kind of behavior is determined by strongly anchored behavioral programs like norms, habits, or emotional reaction schemes. Particular emphasis has been given to this within the long-standing debate on the possibilities and limitations of “rationalist incorporations of norms” (Yee 1997). In this debate, critics of RCT

maintain for the reasons just stated that it is unable to *fully* account for norm-oriented behavior (Elster 1989; Etzioni 1988; Yee 1997).

Taking this criticism seriously, the MFS does not try to reconstruct definite or unconditional forms of (normative) action “as if” they were grounded in rational choices.¹⁴ Instead, they are formalized as automatic-spontaneous selections characterized by a distinct mode of information processing. However, this is not just a matter of descriptive accuracy. Rather, the MFS goes on to explain the *conditions* under which automatic-spontaneous selections will guide behavior. Analyzing the mode selection that precedes the action selection, we can derive a general hypothesis that explains why (normative) action can sometimes indeed be assigned the attribute of “unconditionality” (Elster 1989: 98). As has been derived, an actor will automatically follow the activated script if, and only if, $SEU(as) \geq SEU(rc)$, which can be simplified to

$$\begin{aligned} AW(A_k|S_j) &\geq 1 - C/p(U_{rc} + C_w) & (6c) \\ \Leftrightarrow a_{kj} \cdot a_j \cdot a_{ji} \cdot m_i &\geq 1 - C/p(U_{rc} + C_w). \end{aligned}$$

It follows that an automatic-spontaneous action according to the content of the script without consideration of other alternatives or incentives will prevail if, and only if, the activation weight of the behavioral alternative ($AW(A_k|S_j)$) is at least as high as the threshold on the right side of the inequation. More specifically, scriptconforming behavior in the as-mode is more likely to occur, the more clearly the situation could be defined (m_i), the more unambiguous a certain program of action is appropriate in this type of situation (a_{ji}), the more strongly the actor has mentally anchored this script (a_j), and the more strongly it regulates the respective behavioral choice (a_{kj}). When these conditions are sufficiently met, an actor will be immune towards rational incentives. Hence, the MFS supports Elster’s claim that strongly internalized norms can have a “grip on the mind” (Elster 1989: 100) so that an actor’s behavior becomes “unconditional” (at least with regard to the present situation).

Conversely, we also learn something about the conditionality of rational choice. The less clear it is which frame and script are appropriate, and the less strongly they are mentally anchored, the more likely it is that the actor will engage in a rational choice (rc-mode). Then, too, his behavior might be decisively influenced by social norms. In the rc-mode, however, they operate as various kinds of incentives, e.g. as psychic benefits or costs, or as instrumental incentives tied to possible social sanctions (see Yee 1997). As such, social norms are no longer incommensurable (Taylor 1996), but their value is exchanged against that of other non-normative incentives. Hence, normatively influenced action in the rc-mode is not unconditional but, on the contrary, sensitive towards all kinds of incentives. In the MFS,

norms can guide behavior *both* as autonomous incommensurable reasons and as calculated incentives, and the degree of their internalization is itself one factor (among others) that determines which type of rule-following will prevail in a given situation. This could provide a potential solution to the debate over the status of normative action, arriving at a middle position that is close to the differentiated but informal accounts developed by Etzioni (1988) and Elster (1989).

On an empirical level, we gain a powerful hypothesis that can principally be applied to any situation and that allows us to uniformly explain various mixed-population phenomena. If we restrict our analysis to the degree to which a script has been internalized (as *one* determinant of the mode selection), we expect that actors with a strongly internalized script will follow it unconditionally, whereas those with a low internalization of the script will engage in reflecting-calculating choices, systematically considering other alternatives and incentives. This can be translated into a statistical *interaction* hypothesis stating that *the effects of calculated incentives on the disposition for a certain behavior decrease, the more strongly a corresponding script is internalized, and that in the case of a very strong internalization, other incentives are irrelevant (their effect is statistically not significant)*. This hypothesis has already been confirmed in several applications of the MFS, drawing more complete pictures of why certain couples stay together (Esser 2002), why certain survey respondents are influenced by social desirability (Stocké 2004), why certain citizens participate in elections (Kroneberg 2006), why certain parents choose certain school tracks for their children, and why certain individuals rescued Jews in World War II (Kroneberg, Stocké, and Yaish 2005).

Among those cases, we will shortly present the issue of electoral participation as an illustration of how to apply the MFS, because turnout represents a relatively simple case while simultaneously holding a special place in RCT as the most commonly used example of its failure or its fruitlessness (Aldrich 1993).

An Example: The Explanation of Electoral Participation

In the case of national elections, the frame selection is relatively trivial insofar as citizens typically know that an election is held at a certain date. Thus, they define the situation immediately as “election day” if they come to perceive corresponding situational objects, e.g. in the context of broadcasted election campaigns. Having activated the knowledge that an election is being held, the citizen typically also knows what kind of behavior is normatively

expected of him. So at least in functioning democracies, it is regarded as one's civic duty to cast one's vote. This civic duty norm constitutes the script that is automatically activated once the situation has been defined as "election day". Thus, formally we assume that the match m_i equals 1 (leading to a frame selection in the as-mode) as does the script's accessibility a_{ji} . Because the definition of the situation and the activation of the norm to vote are generally unproblematic, it suffices to focus on the action selection and its preceding mode selection. Thus, the formal model that is actually analyzed empirically is a considerably reduced version of the full MFS.

Regarding the mode selection, it can be further assumed that citizens typically have sufficient opportunities to think about whether to participate or not ($p = 1$). Because the civic duty norm directly refers to participation behavior, we also assume that $a_{kj} = 1$. Thus, the condition for automatic-spontaneous script-conforming behavior (6c) can be simplified to

$$a_j \geq 1 - C/(U_{rc} + C_w).$$

Citizens for whom the internalization of the civic duty norm (a_j) exceeds the threshold on the right side of the inequation will definitely go to the polls on normative grounds. Only citizens with a degree of internalization less than the threshold will engage in a deliberate consideration of the costs and benefits of voting. Statistically, this hypothesis implies a negative interaction effect between the rationally calculated incentives regarding participation and the internalization of the civic voting norm (see above). Even if we lack measurements for reflection costs and motivation, we can test this hypothesis under the assumption that the threshold $1 - C/(U_{rc} + C_w)$ is the same for all voters.

In secondary analyses of several data sets, Kroneberg (2006) found the expected negative interaction effect to be statistically significant. In order to illustrate these results, Figure 3 (reproduced from Kroneberg, Stocké, and Yaish 2005) shows for data collected in the context of a German state election (Kühnel and Ohr 1996; Kühnel and Fuchs 1998) that having political preferences (for a specific candidate and a specific party) exerts a strong positive effect on the probability to participate among those with a minimum degree of norm internalization. Respondents who have internalized the civic duty norm to a maximum extent, however, will participate in any case, so for them the political preference effect is absent. These results constitute direct evidence for the mixed-population explanation offered by the MFS and cast serious doubts on the practice of constructing a uniform utility function for all citizens, as is typically done in rational choice theories of voting.

Beyond this direct confirmation, the MFS is able to account for a number of findings that thus far could not be integrated into any of the existing theories of voting. First and foremost,

there is the puzzle that voting generally seems to be a “consumption activity”, driven by the desire to fulfill one’s civic duty (Blais 2000), and to simply express a particular political preference (Brennan and Lomasky 1993), while at the same time there is clear evidence of strategic voting (e.g. voting for the second-most preferred candidate if the first preference has no chance of winning). This fits equally well into the explanation offered here in which only some citizens participate and/or vote based on a deliberate calculus, as does the general characterization that empirically RCT can only account “for change at the margin” (Grofman 1993: 103). Furthermore, instead of introducing a utility from adhering to one’s civic duty ad hoc, the MFS *predicts* the finding that at least in functioning democracies the civic duty norm is by far the most important factor determining electoral participation (Blais 2000). Moreover, the findings that incentives are much more predictive of participation in subsamples with low attachment to the civic duty norm (Blais 2000) and – more peculiarly – that rainfall significantly reduces the probability of voting only among respondents scoring low on the civic duty indicator (Knack 1994) are just further confirmations of the negative interaction effect derived above. Finally, the finding that the neutral presentation of the voting paradox reduces turnout among students via modification of “the very definition of the act of voting” (Blais and Young 1999: 51) can be explained in the MFS as an abandonment of the civic duty script that resulted from experimentally inducing a script selection in the rc-mode. Conversely, but due to the same underlying mechanism, being personally asked to vote in the weeks preceding the election was found to have a large positive impact on turnout (Gerber and Green 1999).

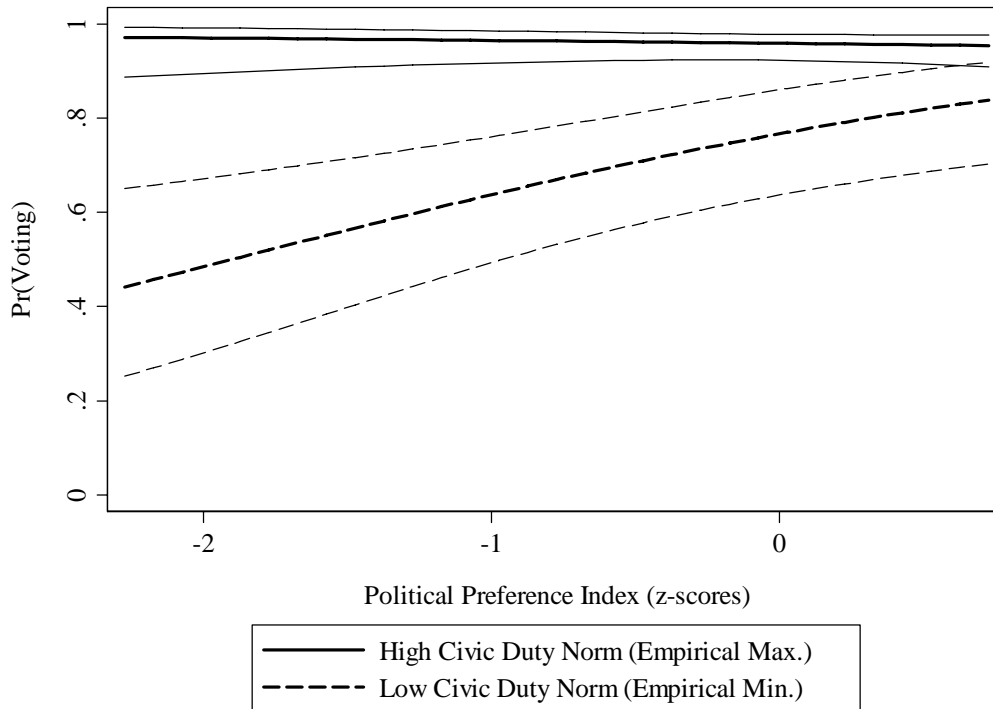


Figure 3: The effect of political preference on the probability to participate for a maximum and a minimum degree of internalization of the civic duty norm: Estimated average effects and 95% confidence intervals (reproduced from Kroneberg, Stocké, and Yaish 2005)

Remarks: The underlying logistic regression model contains the following predictors: civic duty norm (index), political preference (index), civic duty norm X political preference, age (in years), education, and sex. The plotted probabilities have been calculated for male respondents of mean age with compulsory education.

5.2 Strategic Interaction Including the Definition of the Situation and Variable Rationality

The MFS might be capable of more-encompassing explanations of individual behavior. For sociology and the social sciences in general, however, it is at least equally important that a theory of action be suitable for explaining how macro-phenomena emerge from interaction processes between several actors (Lindenberg 1992). We now turn to such *transformational mechanisms*, i.e. to the micro-macro transition that constitutes the last step in Coleman's macro-micro-macro model.

Because a thorough treatment lies beyond the scope of this paper, we restrict ourselves to an existing game-theoretic model that makes already use of ideas elaborated in the MFS. The model developed by Montgomery (1998) is intended to explain observed patterns of cooperation in the New York City garment industry, conceptualizing this exchange as a

finitely repeated Prisoner's Dilemma. The theoretical innovation of Montgomery's model lies in the assumption that each individual can play two distinct roles, that of a businessperson and that of a friend. The latter cooperates unconditionally, whereas the former maximizes profits. In the terminology of the MFS, both players can define the relationship either as "business" or as "friendship", both frames being linked to corresponding scripts that will be automatically activated. The friendship script is a norm requiring unconditional cooperation, and Montgomery implicitly assumes that a player with this definition of the situation will automatically adhere to this norm (action selection in the as-mode). The business script comprises profit-maximization. Because of the complexity involved in realizing this claim, the script cannot fully regulate the relevant behavioral choices, but requires that the player search for and choose the optimal course of action in the present situation (action selection in the rc-mode).

According to Montgomery, the role switch is governed by a meta-rule, such as "if player *i* has never defected and has cooperated at least *x* times, then player *j* is a friend; otherwise, player *j* is a businessperson". In the MFS, this meta-rule corresponds to the links between situational objects and frames, so that player *j*'s definition of the situation in the as-mode depends on the previous behavior of player *i*. According to the cited meta-rule, perceiving cooperation by the other player at least *x* times and defection zero times will lead to a perfect match of the friendship frame; if these conditions are not met, the match of the business frame is perfect.¹⁵

The model further assumes that only in the business frame, will a player have foresight and be aware of the meta-rule governing the frame switch. This way, the definition of the situation and variable rationality interact, leading to "asymmetries in what is taken for granted" (Rambo 1999: 334). Taking into account the effect of his own actions on the other player's definition of the situation and corresponding actions, a player in the business frame will compare the discounted sum of payoffs from two strategies: Either he will simply defect throughout the entire game (as the other player will do in this case) or he will follow a make-your-opponent-into-a-friend strategy. The latter strategy implies to cooperate unilaterally until the other player switches to the friendship frame. After this, ego will benefit from mutual cooperation until the last round, in which he (still being a business person) will defect, taking advantage of the other player's unconditional cooperation. By comparing the payoffs from these kinds of strategies, Montgomery is able to derive equilibria for the game in pure and mixed strategies that mirror the observed patterns of cooperation in the garment industry (e.g.

the prevalence of a trial phase characterized by calculative behavior and the existence of cooperation in endgames).

The reconstruction of Montgomery's model in the analytical framework provided by the MFS should have made it apparent that a more realistic theory of action – incorporating the definition of the situation, as well as variable rationality – does not necessarily preclude the study of the social mechanisms by which individual actions aggregate to macro-phenomena. On the contrary, we have every reason to assume that we will be able to identify the real social mechanisms linking structural conditions and aggregate outcomes only to the extent that we rely upon an empirically valid theory of action. This can also be brought up as an argument against the likely view that theories such as the MFS are too psychological, laying too much emphasis on *intrapersonal* processes, thereby introducing too much complexity on the level of the individual. Montgomery's game-theoretic model illustrates very nicely that the variables responsible for individual behavior simultaneously provide microfoundations for the analysis of social processes.

Furthermore, explanations that take into account the effects of mental models may in fact be much simpler than those assuming that fully rational actors engage in extremely complicated calculations. So if we take up our motivating example, we can hypothesize that the participants in the Prisoner's Dilemma experiment automatically activated the corresponding frames upon encountering the labels "Wall-Street Game" or "Community Game" and tried to behave appropriately. This way, it becomes understandable why social dilemmas are empirically often solved relatively simple as a result of a cooperative definition of situation.

Last but not least, we can draw the methodological lesson that the MFS should be properly understood as just providing the theoretical *option* for more differentiated analyses of individual behavior. In applications, this should be done carefully and only to the extent that it is *necessary* to explain the *social* process of interest. For example, Montgomery's model assumes that exactly one script is fused with a particular frame, so that the script selection is not part of the analysis. This assumption is likely to hold in most everyday low-cost situations in which behavior is typically governed by one particular standard operating procedure. Thus, a considerably reduced version of the MFS often will suffice, although its theoretical potential is to be seen in its ability to conceptualize and explain also more complex phenomena leading to certain actions. The MFS thus follows Lindenberg's claim that a model should be a

“collection of different versions” so that “the highly simplified versions offer analytical power and the later versions offer more descriptive accuracy” (1992: 6).

6. Conclusion

As Jon Elster concedes in one of his recurring critiques of rational choice theory (RCT), “The social sciences today, however, cannot offer a formal model of the interaction between rational and nonrational concerns that would allow us to deduce specific implications for behavior.” (2000: 692). This widely shared assessment (e.g. Bunge 1996; Chong 1996; Etzioni 1988; Green and Shapiro 1994: 204; Taylor 1996; Yee 1997) can be divided into two separate claims. RCT provides formal models of behavior allowing a deductive method of theory construction, but it cannot fully account for “nonrational concerns”, e.g. norms, values, commitments, habits, or emotions, and their interaction with instrumental rationality. Sociological theories of action, on the other hand, do justice to nonrational concerns, treating them as autonomous phenomena not fully reducible to instrumental rationality. They lack, however, the precision and explanatory power that come with a formal model of behavior, thereby missing the chance to realize the potential hidden in their important insights.

The Model of Frame Selection (MFS) that has been put forward in this article tries to overcome these problems of one-sidedness and underspecification by formalizing two basic phenomena: the definition of the situation and the actors’ variable rationality. The model assumes that actors are equipped with domain-specific schemas (frames and scripts) that may be used strategically in some situations, but often guide their behavior unconsciously. These ideas are prominent in cognitive social psychology, but at the same time they are notably in line with the complex conceptualizations of culture developed more recently in sociology such as Bourdieu’s (1980) concept of the habitus or Swidler’s (1986) conception of culture as a toolkit (see also Wimmer 2002). Recognizing this congruence, it is increasingly argued that cognitive social psychology can provide powerful microfoundations for the analyses of the social, the political, and the economic (Denzau and North 1994; DiMaggio 1997). The MFS tries to realize this potential by focusing on the three selections of a frame, a script, and a behavioral alternative and by assuming that each selection can occur either in an automatic-spontaneous mode or in a reflecting-calculating mode of information processing. Moreover, the MFS formalizes the unconscious process in which the mode of information processing is

determined as a “decision” problem that has to be solved by the organism (cf. Heiner 1983), thereby endogenizing an actor’s degree of rationality during a selection.

The basic ideas of the MFS have been laid by Hartmut Esser (2001) in a seminal interdisciplinary synthesis. It attempts to integrate crucial insights from different social science traditions into one analytical framework without depriving these traditions of their very strengths or ignoring their special fields of application. This is in particular true with respect to RCT. The MFS retains RCT as an important special case, but simultaneously moves beyond the limitations of RCT, especially by focusing on the definition of the situation and formalizing spontaneous rule-following. Since these causal mechanisms have been specified in their *interaction* with processes of rational choice, the MFS avoids the deficiencies of typological accounts that treat “rational and nonrational concerns” separately. Moreover, to the extent that the MFS helps to identify which selections are truly governed by forward-looking rationality, the explanatory power of RCT should prove to increase if its application is restricted to the proper cases.

How the MFS can be applied to deduce specific hypotheses has been illustrated by deriving a new explanation of electoral participation and by exemplifying in the case of strategic interaction that it offers new microfoundations for the study of *social* processes. These applications point already toward possible extensions. Rather than taking the parameters of the MFS as given, one could focus on the process in which the content and accessibility of mental models is determined (Strauss and Quinn 1997, p. 103). This could be done by supplementing the MFS with theories of learning (e.g. Macy and Flache 2002) that formalize this process of *encoding* (see Vanberg 2002). Furthermore, one could proceed to develop models of social framing processes, e.g. by combining the MFS with other already-established transformational mechanisms such as diffusion or threshold models of collective behavior (e.g. Granovetter 1978; Granovetter and Soong 1983).

Although such applications and extensions are already within reach, it should be stressed that the MFS constitutes above all an analytical framework that allows us to raise novel research questions and to develop answers in a systematic way. Depending on the kind of application, this will require analysts to rely on empirical data, auxiliary hypotheses, more-specific theories of behavior, and models of social processes.¹⁶ The MFS merely assures that the definition of the situation, social norms, spontaneous rule-following, rational choices, and the various forms of their interaction can be taken into consideration wherever they are deemed important without having to sacrifice formal precision. Given the fundamental significance of both interests and ideas in social life, and thus in explaining phenomena such

as the dynamics of electoral competition, ethnic conflicts, or social movements, we should not go for less.

¹ Furthermore, the discrimination model ignores the possibility of fully rational action in which *all* goals are equally considered, i.e. it does not sufficiently account for actors' variable rationality.

² This result is even more remarkable because the experimenters selected (and randomly assigned) only students for whom dormitory resident assistants expected a certain behavior with a relatively high degree of confidence (at least 85% likely to cooperate or 85% likely to defect under both names of the game) (Lieberman, Samuels, and Ross 2004: 1176). In marked contrast to the different situational labels, these reputations turned out to have no predictive power at all (Lieberman, Samuels, and Ross 2004: 1177).

³ Participants in the no time-pressure condition were instructed to take their time in answering the question that was to follow, whereas participants in the time-pressure condition were warned that they would have only 15 seconds to do so. In the high fear-of-invalidity condition, subjects were informed that their responses would subsequently be compared with the responses of the other subjects and that they would have to explain their decisions to the other subjects and the experimenter. Subjects in the low fear-of-invalidity condition received no special instructions (Sanbonmatsu and Fazio 1990: 617).

⁴ This is the interpretation put forward by Sanbonmatsu and Fazio (1990: 618) and indeed the experiment constitutes clear evidence for actors' variable rationality. Upon closer inspection of their results, however, we can see that the participants who lacked the motivation to reflect (low fear of invalidity) seem to have decided *largely arbitrarily* as indicated by a mean camera shopping decision near 0 on a scale ranging from -2 (buying definitely at Smith's) to +2 (buying definitely at Brown's). If they had followed *general attitudes*, they should have opted to shop definitely at Smith's (-2). Thus, the experimental situation was not completely successful in inducing the formation of stable attitudes similar to those that govern spontaneous behavior in everyday life.

⁵ Although frames and scripts have to be defined and operationalized by the analyst, the MFS does *not* assume that in reality there exist for every situation a set of schemas that are clearly bounded and which actors might even be able to verbalize. Rather "(...) schemas vary in their schematicity, depending on the strength and density of the interconnections among the units of which they are composed." (Strauss and Quinn 1997: 52) and so does the extent to which actors have to construct frames (and scripts) rather than literally activating pre-existing ones.

⁶ Conceptually, it is useful to think about these modes as extreme points of a continuum of growing complexity and effort so that other heuristics can be located in-between (Payne, Bettman, and Johnson 1988). As evident from the prominence of dual-process theories (Chaiken and Trope 1999), the simplifying distinction between these extreme types is deemed sufficient for an adequate explanation even in cognitive social psychology. This should be even more so with regard to sociological models of action since those have to be sufficiently abstract to be usefully exploitable within models of the micro-macro transition (Coleman 1990).

⁷ In the MFS, the as- and the rc-modes serve as ideal types. Apparently, however, this analytical contrast is in need of empirical qualifications. As has been elaborated by phenomenological social theory (Schütz 1970), the very feasibility of rational choices (the rc-mode) rests on a stable background of meaning that an actor can

entirely take for granted. On the other hand, the as-mode encompasses far more than just behaviorist stimulus-response mechanisms, e.g. the unconditional adherence to internalized norms as an outcome of rational discourse.

⁸ Some dual-process theories address this factor only implicitly by assuming that spontaneous information processing constitutes a default mode, “simply because it demands fewer cognitive resources and is the easier of the two processes” (Operario and Fiske 1999: 67).

⁹ As will be discussed explicitly in the context of the mode selection, the match of a frame stands for the (subjective) probability that the corresponding definition of the situation is appropriate or valid. It is also in this context that the inclusion of the match in the scripts’ activation weights becomes explanatorily relevant.

¹⁰ Here again, it has to be noticed that – in the event of a script selection in the rc-mode – the selected script’s appropriateness was rationally examined and its accessibility (a_{ji}) may have changed as a consequence.

¹¹ If the mode selections were meant to refer to a rational decision made by the actor, the MFS justifiably would be subject to serious criticism for two reasons. First, it could be argued that contrary to the explicit aims of the model, the mode selections imply that actors engage in and are capable of complex calculations in every situation (Opp 2004: 260). Second, the mode selections would be causally untenable because the decision on whether to search for more information cannot be based on properties of this unknown information (such as its utility or the probability of discovering it) (Collins 1993: 66).

¹² Besides analyzing the action selection and the corresponding mode selection, we could also focus on the frame and script selection, i.e. on whether or not an actor defines the situation as a slight against his honor in the first place, and whether or not he will activate the code of honor rather than the religious and legal norms that proscribed the duel. To this end, we would have to analyze among other things the relative strength with which the actor has internalized these different norms. Obviously, this will likely be influenced by his social milieu.

¹³ Notably, we do not separately address the first step in Coleman’s macro-micro-macro model, i.e. *situational mechanisms* that specify how individual parameters vary as a function of the social situation (macro-micro) (Hedström and Swedberg 1998: 23). By making the microdeterminants of action explicit, every theory of action automatically provides parameters that can be linked to attributes of the social situation and thereby guides the analysis of situational influences. Therefore, the following applications also demonstrate how the MFS broadens the basis for modeling situational mechanisms.

¹⁴ Although, in principle, it is possible to incorporate such forms of behavior into RCT by manipulating or adding arguments to utility functions, such solutions have for good reasons always caused feelings of discomfort. They deprive RCT of its explanatory power and – even more important – of its heuristic value (Bohman 1992; Boudon 1998; Bunge 1996; Elster 2000; Etzioni 1988; Smelser 1992; Yee 1997).

¹⁵ Montgomery (1998: 112) discusses also alternative meta-rules in which the frame selection depends also on one’s own previous actions.

¹⁶ For instance, it remains to be specified exactly how a certain definition of the situation affects an actor’s rational choices when it comes to selecting a behavioral alternative in the rc-mode. More specific theories nested within the MFS can be applied to answer this question for certain classes of cases, e.g. Prospect Theory (Tversky and Kahneman 1986) in the case of loss and gain frames.

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