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Frames, scripts, and variable rationality: An integrative theory of action

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4.1 Introduction

The program of analytical sociology has an ambivalent relationship towards theories of action. On the one hand, it claims that actor-based social mechanisms need to be identified in order to gain a deeper causal understanding of collective phenomena. Hence, the explanation of individual behavior constitutes an important task that calls for action-theoretic micro-foundations. On the other hand, major proponents of analytical sociology caution against investing too much energy into the explanation of individual behavior, as social interactions, the social networks in which they take place, and the dynamics to which they give rise, should be at the center of theoretical attention (Hedström, 2005; Macy and Willer, 2002). The crux is that the degree of desirable detail in delineating the underlying action-generating mechanisms varies considerably between applications and is difficult to determine beforehand (Hedström and Ylikoski, 2010: 60). In analytical sociology, and in sociology more generally, a theory of action should therefore meet three requirements (Kroneberg, 2011a: 28–41):

1. *Wide applicability*: At the heart of the theory should be action-generating mechanisms that are widely applicable, that is, influence behavior in various contexts and situations and in ways that are of sociological interest (e.g., produce differences between social

groups). Such a theory would allow scholars to base diverse explanations and models of social phenomena on common microfoundations.

2. *Heuristic/hypothesis-generating power*: The theory should be descriptively complex enough to understand the interplay of different determinants of action, such as cultural schemas, moral norms, emotions, or expected consequences. This criterion assures that a theory of action is able to produce sociologically interesting explanations even when the explanatory focus is mainly on individual behavior.
3. *Modularity*: The theory should allow researchers to introduce and drop simplifying assumptions in a systematic and transparent manner. When analyzing complex social dynamics it is often desirable to use relatively simple models of individual behavior. This pragmatic consideration easily opens the door for ad hocism and a proliferation of unrelated behavioral rules in analytical sociology. In contrast, a more complex theory of action that allows researchers to systematically construct highly simplified models for their application at hand promises greater theory guidance and theoretical integration. The criterion of modularity should therefore replace the undifferentiated call for parsimony in microfoundations.

In this contribution, I introduce the *model of frame selection* (Esser, 2009; Kroneberg, 2005; Kroneberg, 2011a) as a theory of action that fulfills these three requirements. The theory is psychologically richer than rational-choice theory as (1) it focuses not only on incentives but also on the way mental models guide behavior and (2) it is based on the assumption of adaptive or “variable” rationality that is taken from dual-process/systems models in social psychology. At the heart of the theory are therefore two traditional sociological ideas that are relevant across a wide range of settings (see requirement 1): the definition of the situation and variable rationality. The theory translates these ideas into a formal model that precisely delineates action-generating mechanisms. Thus, the theory can be used to derive hypotheses about the complex interplay of different determinants of action but also allows construction of highly simplified models of individual behavior in applications that focus on complex social dynamics (see requirements 2 and 3).

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 the actor activates, and which action he or she is willing to perform. These selections are governed by two different mechanisms, depending on how rationally an actor behaves in a situation: either an actor engages in deliberation (reflecting–calculating mode), or the actor spontaneously selects 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 logics, thereby endogenizing an actor’s degree of rationality. The basic ideas of the model were formulated by Esser (2001) and subsequently further elaborated and formalized in my previous work (Kroneberg, 2005; Kroneberg, 2011a).

Its theoretical architecture allows the MFS to integrate key concepts and insights from different sociological approaches. The model therefore clearly shows that analytical sociology is not just a revival of rational-choice theory (see Gross, 2009; Manzo, 2010) and opens up new opportunities to engage with influential theoretical movements that aim at re-establishing the importance of institutions, ideologies, and culture for the study of social reality

(Swidler, 1986; Small, Harding, and Lamont, 2010; Cerulo, 2010; DiMaggio, 1997; Young, 2010).

In the following, I develop the MFS and show how it can be and has been used to derive new hypotheses in a wide range of sociological fields. To further illustrate its explanatory power, I present an application to the case of voter participation. The MFS yields a new solution to the famous voting paradox (Kroneberg, Yaish, and Stocké, 2010b) which I subject to an additional test in a secondary analysis of Canadian survey data (taken from Blais, 2000). In the final sections, I sketch how the MFS can provide flexible microfoundations for analytical sociology.

4.2 The model of frame selection (MFS)

4.2.1 Frames, scripts, and actions

The *definition of the situation* generally refers to a process in which actors make sense of the situations they encounter (Young, 2010). This meaning-making involves actors activating, applying, and constructing interpretations of their (social) world based on significant symbols. The assumption that the definition of the situation is a prerequisite to any action has been embraced by both normative sociology (e.g., Parsons, 1937: 44) and interpretative sociology (e.g., Thomas and Znaniecki, 1927: 68–70). As emphasized in the Mead–Blumer tradition of symbolic interactionism and by Goffman (1974), actors usually construct the meaning of a situation interactively by sending and interpreting significant symbols. However, in order to analytically dissect such social interaction processes, it is necessary to first focus on the underlying cognitive processes.

Borrowing from cognitive social psychology and cultural anthropology (see DiMaggio, 1997), the MFS adopts 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). The 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). Both equip an individual with partially prefabricated answers to critical questions the individual 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, actors define a situation by activating a particular frame. For most situations actors possess scripts, that is, behavioral predispositions or programs of action, which answer questions such as “How am I expected to behave?” In the MFS, the term “script” can refer to moral norms, conventions, routines, and emotional or cultural reaction schemes held by the actor.

From an observer’s point of view, an actor can interpret a given situation in many ways, and when searching for the appropriate kind of action within a defined situation, the actor is again confronted with several alternatives. The processes of activating a particular frame and a script are therefore termed *frame selection* and *script selection*. Both precede the building of a behavioral intention, or *action selection*, by which an actor answers the question “What am I going to do?” Thus, in contrast to theories that directly and exclusively focus on choices among action alternatives, the MFS allows researchers to build on the “important sociological insight that the definition of the situation matters” (Lindenberg, 1989: 194) by considering the often large extent to which behavior is structured by mental models.

4.2.2 Dual-processes: Spontaneous vs. reflected modes of selection

Sociologists have long noted that human behavior is characterized by different degrees and forms of rationality. For instance, Weber's (1978) types of social action presume that actors only sometimes consider alternative means, consequences, and their relative importance and that routine and emotional actions are characterized by the very absence of forward-looking deliberation. Similarly, Schütz's (1970) theory of everyday behavior states that people are usually well equipped with mental models for typical situations, which they use routinely to define situations and act in them without any rational deliberation. This flow of habitualized behavior is only interrupted if some unexpected event seriously questions the applicability of the unconsciously used mental models (Garfinkel, 1967).

Today, a substantial body of research in psychology and the brain sciences supports the notion of "variable" rationality (see Chaiken and Trope, 1999; Smith and DeCoster, 2000; Lieberman, 2007; Rilling and Sanfey, 2011). This evidence has given rise to so-called dual-process (or dual-systems) models of cognition and behavior which assume that "social behavior is the effect of the operation of two distinct systems of information processing: a reflective system and an impulsive system" (Strack and Deutsch, 2004: 222). In the same way, the MFS distinguishes between an automatic–spontaneous mode (as-mode) and a reflecting–calculating mode (rc-mode) of information processing. The as-mode stands for a spontaneous selection of one particular taken-for-granted alternative. As it is based solely on the situational activation of mental models and their chronic accessibility, the as-mode frees the actor from having to scrutinize competing alternatives (Fiske and Neuberg, 1990). In contrast, the rc-mode represents a decision process in which actors deliberate on several alternatives and take into account the value and probabilities of possible consequences.

Human behavior is simultaneously governed by the reflective and impulsive systems. Just as it is not possible to reflect on everything at one point in time, fully automatic behavior is extremely rare. It is therefore important to note that the MFS asks *in what respects* a particular behavior is taken for granted or spontaneous. For example, individuals may search for a new apartment only in a very narrow set of neighborhoods and it is in this respect then that their behavior spontaneously follows a particular definition of what constitutes a good neighborhood and a corresponding script (see Etzioni, 1988: 97–98; similarly Young, 2010). At the same time, their choice of a particular apartment within this restricted choice set might be a highly reflected one.¹

Figure 4.1 gives an overall representation of the model. The MFS considers to what extent the selection of frame, script, and action each occurs in one or the other mode of selection. The model follows a "default-interventionist" (Evans, 2008) conception of dual processing: as

¹ Thus, the distinction between the two modes of selection is an analytical one that depends on the variation to be explained. If we are interested in the taken-for-granted elements of the behavior of particular actors (i.e., if we compare them to actors who choose from a less restricted set of alternatives), we would conceptualize their behavior as resulting from an action selection in the as-mode. In a different analytical comparison, we could at the same time focus on the deliberation-based elements of their behavior. Thus, the model does not assume that a concrete behavior originates *either* in reflection *or* in spontaneous activation, but allows one to distinguish between varying objects and degrees of reflection.

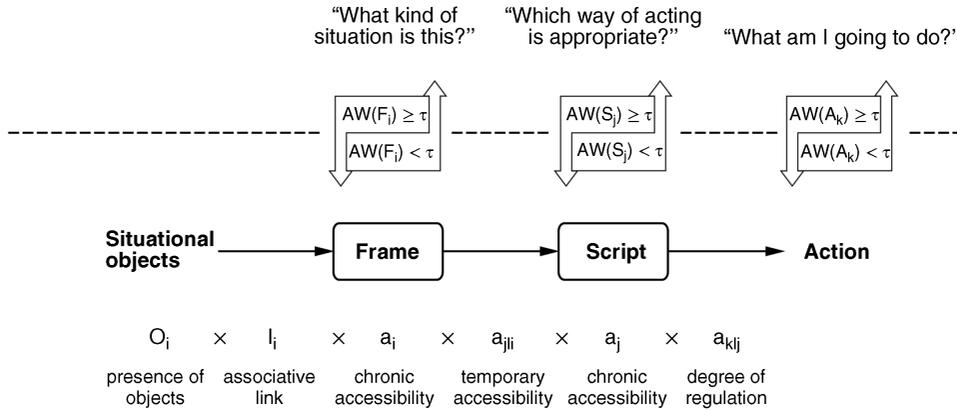
Reflecting–calculating mode**Automatic–spontaneous mode**

Figure 4.1 Spreading activation (as-mode) and reflection (rc-mode) as two modes of frame, script, and action selections.

elaborate reasoning processes are time consuming and energy intensive, it is highly adaptive for an organism to rely on mental models and programs as long as they deliver an appropriate solution to a problem. Hence, everyday behavior is largely governed by the as-mode in a process of spreading activation that runs from frames over scripts to behavior. As shown in Figure 4.1, it is only if activation falls below a certain threshold that actors switch to the rc-mode and start to reflect about the choice in question. The determinants of this threshold and, hence, of actors' variable rationality will be addressed further below. I now turn to the formal specification of the two modes.

Formally, denote by F the set of frames F , by S the set of scripts, and by A the set of behavioral alternatives A that are available to an actor in a situation. The *as-mode* describes a process of spreading activation. Hence, the alternative with the highest *activation weight* (AW) is selected. The activation weights of a frame $F_i \in F$, a script $S_j \in S$, and an action alternative $A_k \in A$ are defined as follows (see Figure 4.1):

$$AW(F_i) = m_i = o_i \cdot l_i \cdot a_i \quad (4.1)$$

$$AW(S_j|F_i) = AW(F_i) \cdot a_{ji} \cdot a_j \quad (4.2)$$

$$AW(A_k|S_j) = AW(S_j|F_i) \cdot a_{kj}, \quad (4.3)$$

where all parameters lie in the unit interval $[0,1]$.

The activation of a frame is determined solely by its immediately experienced *match* to the objective situation (see Equation (4.1)). How well a frame fits to a situation depends on its chronic accessibility (a_i), the presence of situational objects that are significant for the frame (o_i), and the associative link between the frame and the situational objects (l_i). The chronic accessibility of the frame corresponds to an actor's general disposition to activate it and interpret situations accordingly. It is a relatively stable attribute of the actor that mostly

reflects socialization, experience, and learning.² As a mental representation of a class of situations, each frame encompasses typical objects whose presence in the situation signals its applicability. Many significant cues of this kind emanate from other actors' observable behavior in a situation, leading to behavioral cascades and other social processes.

Should the *script selection* occur in the as-mode, the activation of a script S_j will be the greater, the higher its chronic accessibility (a_j), the higher its temporary accessibility given the selection of frame F_i and further situational cues ($a_{j|i}$), and the higher the match of the selected frame (see Equation (4.2)).³ The chronic accessibility of the script represents how strongly it is mentally anchored, for example, how strongly an actor has internalized a norm, become accustomed to a routine, or is predisposed to show a particular emotional (e.g., aggressive) response. As scripts are more or less specific to certain situations, their temporary accessibility depends on their mental association with the selected frame. In addition, situational cues can directly activate behavioral predispositions and programs. Finally, as part of the spreading activation process, the activation of a script also depends on how unequivocally the situation could be defined, that is, the match of the selected frame. Uncertainty about the type of situation translates into uncertainty about the appropriateness of potential scripts.

When the *action selection* takes place in the as-mode, the actor follows the selected script and perceives of no alternative to the script-based course of action. Again, the activation weight depends on the strength of previous activations because the spontaneous impulse to follow a script will be weaker if an actor is unsure about the kind of situation he or she is facing or about the applicability of the script. The only additional parameter is the degree to which the script S_j implies a certain action A_k ($a_{k|j}$). Scripts cannot regulate in an encompassing and unambiguous way all potential behavioral choices in a situation. If a script is incomplete with regard to a behavioral choice ($a_{k|j} = 0$), a spontaneous script-based action is impossible.

If the process of spreading activation becomes too weak at any point (see the next section), the actor starts to deliberate over the perceived alternatives and makes a reflected choice. In the *reflected-calculating mode* of information processing (*rc-mode*) the actor will deliberately select the alternative with the highest *subjective expected utility* (SEU). Formally, the decision weights of a frame $F_i \in F$, a script $S_j \in S$, and an action alternative $A_k \in A$ are defined as follows:

$$\text{SEU}(F_i) = p_{i1} \dots \bar{U}_{\text{app}} \quad (4.4)$$

$$\text{SEU}(S_j|F_i) = p_{j1} \dots \bar{U}_{\text{app}} \quad (4.5)$$

$$\text{SEU}(A_k|F_i, S_j) = \sum p_m(\cdot, F_i, S_j) U_m(\cdot, F_i, S_j) \quad \text{for all } A_k \in A(\cdot, F_i, S_j). \quad (4.6)$$

² Following a suggestion by Rompf (2012), I distinguish between chronic and temporary accessibility of mental models (instead of speaking of "availability" in the former case, as in previous publications). Accessibility denotes the activation potential of knowledge, which depends on both relatively stable individual differences (e.g., cross-cultural differences) and temporary situational influences (Higgins, 1996).

³ The parameters are multiplicatively linked because, in a defined situation, a script that relates to a completely different type of situation and that is not activated by any cues (temporary accessibility $a_{j|i} = 0$) should by no means be selected, *independent* of how strongly it is mentally anchored in general (chronic accessibility a_j).

Frame and script selections usually follow a “logic of appropriateness” (March and Olsen, 1989), that is, a search for good reasons (Boudon, 1996) in which actors aim at identifying the most appropriate alternative. For example, a parent whose child has failed an exam can define the situation as a slip-up or as a serious school problem. In doing so, a parent usually would want to get a realistic picture of the child’s situation and would therefore define it as a slip-up only if the evidence is more in support of this frame. Some scholars have correctly stressed that such exercises in “cognitive rationality” do not involve a weighing of costs and benefits (Boudon, 1998; March and Olsen, 1989). However, identifying the most appropriate alternative also constitutes a goal (\bar{U}_{app}) and actors are motivated to pursue it because the success of subsequent actions often depends on a valid definition of the situation and on identification of the socially expected line of behavior (Lindenberg, 1989: 178). Hence, this kind of cognitive rationality can formally be represented within expectancy-value theory: the frames or scripts differ mainly with respect to the expectation to define the situation appropriately (p_{i1}) or to identify the appropriate line of action (p_{j1}). In the ideal-typical case, selecting the most appropriate alternative is the only relevant consequence. As it is constant over the range of alternatives, the instrumental value of an appropriate choice remains in the implicit background while actors are occupied with judging the plausibility of different frames and scripts. Thus, frame or script selections in the rc-mode typically have to be explained with regard to the good reasons actors come to find (Boudon, 1996).

However, in other cases actors’ reflections can also be biased by their self-interest (see Elster, 1989: 125–128). For example, imagine a mother who deceives herself about her child’s school performance because she wants to retain her ideal or fears the efforts that would come with tackling a serious school problem. The advantage of expectancy-value theory is that it can also represent such cases by extending the utility functions in Equations (4.4) and (4.5). Hence, it is an empirical question of which consequences an actor takes into consideration and how he evaluates them.

The *action selection* in the rc-mode is qualitatively different from the two previous selections. As it results in overt behavior that might have far-reaching consequences, an actor typically will explicitly consider, evaluate, and weigh different and rather specific consequences. When it comes to explaining the outcome of this calculus, rational-choice theories are especially powerful. A particularly interesting possibility is that an actor conditions his or her behavior on the likely actions of others, anticipating that they will reason in the same strategic way. In such cases, actors may follow one of the complex rules of decision making developed in game theory. Consequently, expectancy-value theory is only a special case of action selection in the rc-mode, and other forms of rational action are also possible.

In the MFS, the rc-mode incorporates the forward-looking conceptions of rationality developed within rational-choice theory as a special case of a more general theory of action (Esser, 2009). Additionally, the MFS allows scholars to study the frame and script selection (Boudon, 1996) and to incorporate influences of the definition of the situation on rational action. Akin to more recent developments in economics (Akerlof and Kranton, 2000; Bicchieri, 2006; Dufwenberg, Gächter, and Hennig-Schmidt, 2011; Fehr and Hoff, 2011), one could specify how actors’ perceived choice set, preferences, and expectations vary depending on the selected frame and script. As has been stressed by sociologists (see Lindenberg, 1989; Etzioni, 1988: 96–100), the definition of the situation affects also behavior in the rc-mode by activating knowledge structures, situational goals, values, and emotions. Moreover, once 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 (see Equation (4.6)).⁴

4.2.3 The determinants of variable rationality

Many traditional sociological theories of action have stopped at the conceptual distinction between a spontaneous and a deliberate mode of information processing. In order to realize the explanatory power of the idea of variable rationality, it is crucial to also address *under which conditions* a specific mode governs a selection. In its answer to this question, the MFS relies on experimental and theoretical work in social psychology (Chaiken and Trope, 1999; Smith and DeCoster, 2000; Strack and Deutsch, 2004). Leaving aside minor differences in terminology and substance, the majority of dual-process theories agree on four determinants of the mode of information processing: opportunities, motivation, effort, and accessibility. With regard to the first two variables, a deliberating mode of information processing becomes the more likely, the less it is hampered by restrictions, for example, 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 (subjectively) rational deliberation because this more elaborated mode inevitably causes reflection costs in the form of foregone time and energy (*effort*). Finally, automatic–spontaneous selections depend on the *accessibility* of appropriate ready-to-use programs. As will become clear below, this fourth variable is of particular theoretical importance because it links actors' variable rationality to the spontaneous activation of mental models in a situation.

While social psychological research has yielded knowledge about the factors influencing actors' degree of rationality (Strack and Deutsch, 2004), there is no formalized model of the underlying processes which precisely specifies the interplay of these variables. In contrast to mere verbal accounts, such a model can be used to systematically derive hypotheses and to build formal models of social dynamics (see below). The MFS goes this further step by translating the insights of dual-process theories into a formalized decision-theoretic framework.⁵

The basic idea is that the employment of a certain mode of information processing can be thought of as the outcome of a selection. For each substantial selection – that of a frame, a script, and an action – there is one corresponding *mode selection* that determines whether it takes place in an *automatic–spontaneous* (as-)mode or in a *reflecting–calculating* (rc-) mode (see Figure 4.1). As the four determinants mentioned above indicate, the human brain seems to have evolved in ways that yield an adapted response to the trade-off between the potential gain in accuracy and the effort that is associated with a more data-driven mode of information processing (the so-called “sufficiency principle,” see Chen and Chaiken, 1999). To capture this adaptedness, the mode selection is specified using the formal apparatus of decision theory. This does by no means imply that actors consciously calculate or compare expected utilities. Rather, the mode selection summarizes how the human brain reacts in an

⁴ When specifying how exactly a certain definition of the situation affects an actor's choices in the rc-mode, analyses have to rely either on more specific theories, for example, prospect theory (Tversky and Kahneman, 1986) in the case of loss and gain frames, or on auxiliary hypotheses and empirical data. At this point the MFS merely provides an analytical framework (similar to Akerlof and Kranton, 2000).

⁵ Similar attempts to explain actors' degree of rationality as the outcome of a meta-selection have been made in economics (e.g., Stigler, 1961; Heiner, 1983). However, none of the economic models has paid due attention to the accessibility of mental models or to the processes by which they guide behavior.

adapted fashion to situational stimuli when determining whether or not an actor assigns attention to an issue.

For a general derivation of the mode selection, I denote by $\Omega = \{O_1, \dots, O_K\}$ the set of options among which a substantial selection takes place. Depending on which substantial selection we are looking at, these can be frames, or scripts, or different courses of action. The alternatives of the mode selection then are the rc-mode and the as-mode of information processing. Note that since the rc-mode represents the more effortful alternative, it will govern a selection only if it seems feasible and necessary. The two relevant *states of the world* are therefore (1) whether or not sufficient opportunities for reflection exist, and (2) whether or not the alternative that can be activated spontaneously is valid. Denote as p the probability that sufficient opportunities for reflection exist. Denote as $AW(O_i)$ the probability that the spontaneously available alternative $O_i \in \Omega$ is valid. Assuming independence, the probability that any combination of the two states of the world will occur equals the product of the respective probabilities.⁶

We can now specify the payoffs that result from selection of the two modes: in the *as-mode*, the actor selects the alternative O_i that has the highest activation weight. It therefore does not matter whether or not sufficient opportunities for reflection exist. If O_i is valid, the as-mode results in a payoff denoted as U_i . If it is invalid, it will lead to a wrong selection, and therefore to costs C_w . Weighted with the respective probabilities, this yields

$$SEU(\text{as}) = AW(O_i)U_i - (1 - AW(O_i))C_w. \quad (4.7)$$

The *rc-mode* inevitably brings about reflection costs C in the form of time and energy. However, the greater effort might pay off if the alternative that would be selected in the as-mode is *not* valid, $(1 - AW(O_i))$. If, in this situation, sufficient opportunities for reflection exist (p), the rc-mode will allow the actor to identify some other, valid alternative, resulting in a payoff of U_{rc} . If O_i is not valid, but reflection fails due to insufficient opportunities $(1 - p)$, or if the spontaneously accessible alternative O_i is valid anyway, the same alternative will be selected in either mode. Adding up the expected payoffs of the rc-mode yields

$$SEU(\text{rc}) = p(1 - AW(O_i))U_{rc} + (1 - p)(1 - AW(O_i))(-C_w) + AW(O_i)U_i - C. \quad (4.8)$$

The rc-mode will be selected if $SEU(\text{rc}) > SEU(\text{as})$, which yields the following condition:

$$p(1 - AW(O_i))(U_{rc} + C_w) > C. \quad (4.9)$$

Thus, 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 spontaneously accessible alternative is *not* valid, $(1 - AW(O_i))$, only the selection of the rc-mode will bring about the utility of a valid selection (U_{rc}) and avoid the costs of an invalid one (C_w).

To simplify notation, I define $U \equiv U_{rc} + C_w$. This sum represents what can be gained by selecting the rc-mode rather than the as-mode, and this corresponds exactly to the notions of “motivation,” “perceived costliness of a judgmental mistake,” or “fear of invalidity” as put

⁶ Combining the two states of the world yields four possible events. By cross-tabulating them with the two alternative modes, one arrives at a 2×4 decision matrix on which the following payoffs are defined.

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.

If one considers the condition for the as-mode, $SEU(as) \geq SEU(rc)$, solving for the highest activation weight yields

$$AW(O_i) \geq 1 - C/(pU). \quad (4.10)$$

In this decision-theoretic context, $AW(O_i)$ is the probability that the alternative which can be spontaneously selected is valid. At the same time, it is the strength with which an alternative is activated in a situation. The more strongly the actors' frames and scripts get activated in a situation, the more likely it is that these will spontaneously govern their perception and behavior. The rationale is that strong activation signals to the actor that an alternative is highly relevant or applicable.

By replacing $AW(O_i)$ with the activation weights given in Equations (4.1)–(4.3), one sees that the requirements for a spontaneous response increase from one step of the spreading activation process to the next (see again Figure 4.1). A frame selection in the as-mode requires that the situational objects signal clearly the validity of a certain frame (m_i). In order for the script selection to occur spontaneously, there must further be a strongly anchored script that is highly accessible in this situation (a_j, a_{ji}). Finally, an action selection in the as-mode rests on the additional requirement that the script clearly implies the choice of a particular alternative ($a_{k|j}$).

Again, to properly understand the MFS, it is important to note that the mode selection represents a spontaneous process. Consequently, the values of all parameters reflect directly perceived attributes of the situation and mentally encoded experiences. 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 the extent to which sufficient opportunities for reflection (p) exist, reflection might be valuable (U_{rc}) or costly (C), and a wrong selection can lead to costs (C_w). Hence, no forward-looking rationality is at work in the mode selection and expectancy-value theory is employed only for the sake of precision and in order to capture the adaptedness of human information processing (similarly Heiner, 1983).

4.3 Hypotheses and previous applications

The MFS is built on empirical insights gained in experimental social psychology and the brain sciences. In line with a number of programmatic statements (DiMaggio, 1997; Denzau and North, 1994), it presumes that incorporating them offers powerful microfoundations for the analyses of the social, the political, and the economic. I now deliver on this promise by demonstrating how the model allows researchers to derive hypotheses that are both of sociological interest and testable with the kind of data typically available to sociologists. Specifically, I focus on a set of hypotheses that identify conditions under which behavior is more or less responsive to calculated incentives.

Going beyond the economic dictum that behavior always follows incentives, the MFS recognizes actors' variable rationality and asks in which respects the behavior of one group of

actors might respond to incentives that another group of actors does not even perceive of. For example, many rational-choice models assume that actors engage in a particular activity (a crime, a protest, etc.) when its uncertain benefits surpass its costs: $p_1U_1 - C_2 > 0$. The MFS predicts that actors who decide spontaneously do not consider such incentives. The determinants of the mode of information processing should therefore determine the influence of the calculated incentives on behavior. Thus, the model allows one to derive hypotheses on the *conditions* that determine the impact of calculated incentives and therefore predicts a number of statistical interaction effects.

As has been derived, an actor will spontaneously follow the activated script if the activation weight of the behavioral alternative ($AW(A_k|S_j)$) is at least as high as the threshold $1 - C/(pU)$. Denoting this threshold by τ and substituting the activation weight by its components yields

$$a_{k|j} \cdot a_j \cdot a_{j|i} \cdot m_i \geq \tau. \quad (4.11)$$

We can now derive *ceteris paribus* hypotheses about how each component of the spontaneous activation weight can moderate the influence of calculated incentives if the remaining components are close to 1:

Hypothesis 1

Assume that an actor could clearly define a situation (high m_i) and has activated a script that implies a certain behavior (high $a_{k|j}$ and $a_{j|i}$). Under these conditions, the effects of calculated incentives on the disposition to engage in this behavior decrease, the more strongly the script is *internalized* (a_j). In the case of a very strong internalization, other incentives are irrelevant.⁷

The hypothesis is based on the assumption that actors with a strongly internalized script will tend to follow it spontaneously, whereas those with a weak internalization of the script will engage in reflecting–calculating choices, systematically considering other alternatives and incentives. It can be tested in a wide range of sociological research fields, as available survey data often comprise indicators of calculated incentives as well as attitudinal measures that tap into the strength of script internalization. In order to conduct a meaningful test, researchers should address the extent to which the initially stated scope conditions of the hypothesis hold in a particular application. Moreover, it is necessary to identify incentive measures that have strong effects since only then does sufficient statistical power exist to investigate their moderation by script internalization (Aguinis and Stone-Romero, 1997).

Focusing on the temporary accessibility of the script as another component of the spontaneous activation weight, we gain a second hypothesis:

Hypothesis 2

Assume that an actor could clearly define a situation (high m_i) and has internalized a script that implies a certain behavior in this situation (high $a_{k|j}$ and a_j). Under these conditions, the effects of calculated incentives on the disposition to engage in this behavior decrease, the more

⁷The threshold τ can take on only values close to 1 (if C approaches 0) or smaller (since C , p , and U are by definition non-negative). It follows that if the internalization of the norm is perfect, $a_j = 1$, the as-mode should prevail independent of the other parameters.

strongly the script *gets activated* in the situation (a_{ji}). In the case of a very strong activation, that is, temporary accessibility, other incentives are irrelevant.

Compared to hypothesis 1, the degree of script internalization is now assumed to be high, while the situational activation of the script is focused on through its potential to trigger a spontaneous reaction that is independent of calculated incentives. In the same fashion, one can derive hypotheses that predict a statistical interaction between the impact of incentives and the ambiguity of the situation or the degree to which the script implies choice of a particular alternative.

So far I have only focused on the components of the activation weight that determine the spontaneous impulse to show a particular behavior. Further hypotheses can be derived if one considers the other determinants of variable rationality: the motivation and the opportunities to reflect, and the effort involved. For example, the model predicts that situational cues that signal high opportunity costs of a wrong decision will increase actors' motivation to reflect. All else being equal, this will make it more likely that actors will respond in a reflected mode of information processing. When stakes are high, actors will therefore be less likely to spontaneously follow behavioral routines or norms and more likely to systematically take into account calculated incentives. Thus, the MFS provides a basis to derive the intuition that normative attitudes shape behavior more in high-cost situations than in low-cost situations (the so-called low-cost hypothesis, see Diekmann and Preisendörfer, 2003; Best and Kroneberg, 2012).

The hypotheses that can be derived from the MFS are relevant across a wide range of substantive fields. As the applications summarized in Table 4.1 show, the MFS has already been used to study altruism, cultural consumption, crime, education, environmental behavior, fertility, political participation, and the stability of partnerships. Moreover, there are further analyses based on the MFS in these fields as well as in other areas, for example, on the dynamics of ethnic conflicts (Esser, 1999) or the occurrence of arguing and bargaining in international negotiations (Kotzian, 2007). In all these fields, application of the MFS has yielded new insights and has helped to integrate culturalist–normativist and rational-choice approaches into more comprehensive explanations.

4.4 An exemplary application using survey data: Explaining voter participation

4.4.1 Theory

To illustrate in more detail how the MFS can be applied to explain social action using survey data, I turn to the example of voter turnout. Explaining why citizens participate in elections has been the most famous puzzle for rational-choice theory, as voting has non-zero costs but the impact of a single vote on the outcome is negligible. In response, there have been numerous attempts within rational-choice theory to solve the voting paradox. However, most of them suffer from one of two fundamental shortcomings. A first group of explanations can be accused of “mechanism-based storytelling” (Hedström and Ylikoski, 2010), as they amount to mere thought experiments about what could drive citizens to the voting booth if they were instrumentally rational agents. A second group acknowledges the consistent empirical finding that non-instrumental motives are the dominant driving forces of electoral

Table 4.1 A selection of recent applications of the MFS.

Application of the MFS	Area	Selected findings
Nauck (2007)	Fertility (country comparison)	The effects of individual resources, opportunities, and the value of children on individual fertility decisions vary with the state of the demographic transition: Incentive effects are much greater in transitional societies than in societies where the fertility decline is more or less completed. Cross-national differences in fertility rates seem to be related to culturally supported, "institutionalized" routine solutions
Eckhard (2010)*	Fertility	The well-known finding of lower fertility rates among highly educated women (due to higher opportunity costs) does not hold for couples with a family-oriented framing of their relationship. The latter is operationalized by the presence of three indicators: Respondents not only perceive of their relationship as intact and feel a very close emotional attachment, but also do not fully agree with the statement that sexuality plays a big role in their relationship. This third component of the frame differentiates family-oriented relationships from mere partner-oriented, probably more hedonistic ones
Kroneberg, Heintze, and Mehlkop (2010a)	Crime	The willingness to engage in tax fraud and shoplifting depends on the expected costs and benefits of these acts, but only among individuals who do not feel bound by moral norms. Where norms have been strongly internalized, and in the absence of neutralizations, instrumental incentives are irrelevant
Kroneberg, Yaish, and Stocké (2010b)	Altruism	In World War II, only potential rescuers with weak prosocial orientation based their response to a request to help Jews on how risky they perceived rescuing to be.
Mayerl (2010)*	Donations	Individuals with strong prosocial orientation helped independently of this incentive The impact of attitudes on donating to social charity organizations is greatest if the attitudes' temporary accessibility is high (indicated by frequent conversations about donating money) and the motivation to reflect is low (indicated by a relatively high equivalent income)
Hunkler and Kneip (2010)*	Stability of partnerships	Events such as drug problems, betrayal, and violence do not always reduce the stability of partnerships. Rather, their impact depends on the extent to which partners personally (continued)

Table 4.1 (Continued)

Application of the MFS	Area	Selected findings
Best and Kneip (2011)	Environmental behavior	think of them as serious problems for a relationship and on whether respondents frame their relationships as an indissoluble institution The change from a drop-off system of household waste recycling (with containers at street corners) to a curbside recycling scheme (being less costly in terms of time and effort) increases participation rates. However, the average incentive effect tends to be weaker among individuals with strong environmental concern (not significant)
Weingartner (2012)*	Cultural consumption	Highbrow cultural consumption follows cultural preferences and opportunities but these incentive effects are smaller when individuals possess strongly internalized cultural orientations and routines
Rompf (2012)	Trust (experimental economics)	In an investment game, strong norms of reciprocity and a cooperative framing via situational cues suppress the negative stake size effect on trust
Stocké, Yaish, and Kroneberg (in preparation)	Education	In choosing among secondary school tracks for their children in Germany, parents with high aspirations and, thus, a strong self-commitment to realize high educational degrees, largely ignore their children's risk of school failure, whereas those with lower ambitions take it strongly into account

*Article/book in German only.

participation. However, both inside and outside of rational-choice theory it has been repeatedly argued that simply expanding voters' utility functions to include consumption benefits, such as a desire to act in accordance with internalized norms that demand participation or a desire to express one's political preferences, is dubious. Even if the resulting explanations are testable, the underlying wide version of rational-choice theory (see Opp, 1999) allows assimilating almost any variable as an "incentive" and is therefore of little explanatory power and heuristic value (Kroneberg and Kalter, 2012).

The MFS yields an explanation of electoral participation that is able to account for the existing empirical evidence while at the same time carrying specific predictions about the interplay of different determinants of participation. Moreover, it makes it possible to integrate rational-choice explanations with theoretical accounts that conceive of voting as habit forming and the result of adaptive learning (Gerber, Green, and Shachar, 2003; Bendor, Diermeier, and Ting, 2003; Fowler, 2006). The MFS allows highly differentiated explanations of social behavior. Increasing complexity is often not desirable, however, especially as available data put limits on testing the resulting explanations empirically. In analyses of voter participation using survey data, it is most often impossible to study the processes of frame and script selection. Whether or not individuals define the situation as "election date" depends, among other things, on their political interest and their exposure to information through media consumption and personal networks (Becker, 2004). However, at least those individuals who agree to take part in an election survey typically know that an election will be held at a certain date. Moreover, in most democracies casting one's vote constitutes a social norm. This means that a citizen typically knows that participating is normatively expected of him or her when an election is held, even if the citizen might not feel personally committed to this civic duty norm. We will therefore make the following simplifying assumption: the situation is unambiguously defined as "election day" (match $m_i = 1$) and the only relevant script is the civic duty norm (temporary accessibility $a_{ji} = 1$), which clearly prescribes participation ($a_{kj} = 1$).⁸ Regarding the mode selection, it can be further assumed that citizens typically have sufficient opportunities to think about whether to participate or not ($p = 1$).

Assuming an unproblematic definition of the situation and script selection, we can rely on a considerably reduced version of the MFS and focus directly on the action selection and its preceding mode selection. Based on our assumptions, the condition for a spontaneous adherence to the civic duty norm (see Equations (4.10) and (4.11)) simplifies to

$$a_j \geq 1 - C/U.$$

Citizens for whom the internalization of the civic duty norm (a_j) exceeds the threshold on the right-hand side 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 interaction effects between the rationally calculated incentives regarding participation and the internalization of the civic voting norm. Even if we lack measurements for reflection costs and motivation, we can test this hypothesis under the assumption that the threshold $1 - C/U$ is the same for all voters.

⁸ A more complex conceptualization could additionally focus on citizens for whom non-voting is a habit (Plutzer, 2002) or on competing scripts such as a family's traditional ski trip on the first weekend in October or staying at home when sick.

In a secondary analysis of data collected in the context of a German state election, Kroneberg, Yaish, and Stocké (2010b) confirmed the interaction hypothesis derived from the MFS. Their results showed that feeling obliged to vote let citizens participate independent of the incentive to express political preferences and the expectation to influence the election outcome. In the following, I present the results of an additional test using data from Canada.

4.4.2 Data and measures

The data stem from the study by Blais and Young (1999) who interviewed students of the Universities of Montreal and Western Ontario in the context of the 1993 Canadian federal election.⁹ The study consisted of three waves, two of which preceded the election by five and two weeks, respectively, and one which followed it a week later. My analysis will use the following incentive measures:

- *Perceived closeness* is a proxy for the subjective expectation to influence the outcome of the election: Separately for Canada as a whole and for their own riding, respondents were asked how close they think the election would be.
- A measure of *perceived importance* taps into the perceived benefits of influencing the election outcome. Separately for Canada as a whole and for their own riding, respondents indicated how important it was to them, personally, which candidate or party was going to win the election.
- *Party identification* is another measure of the perceived benefits of voting. It was asked whether or not, in federal politics, the respondent usually thought of him- or herself as being closer to one or to another political party.
- Two items measure the *perceived costs* of participation: “It is so easy to vote that I don’t see any reason not to” and “How difficult do you think it would be for you to go and cast your vote?”

An additive index of four items (response categories: agree strongly, agree, disagree, disagree strongly) captures internalization of the *civic duty norm*: the standard item states that in democracies it is the duty of every citizen to vote. A measure of the personal feelings of obligation asks whether one would feel guilty if one did not vote. The unconditionality of the norm is captured by the item “It is important to vote, even if my party or candidate has no chance of winning.” The main normative reasoning behind the norm is tapped into by the item “In order to preserve democracy, it is essential that the great majority of citizens vote.” Although capturing different aspects of the relevant norm, a factor analysis confirms that the indicators can be combined into an index.¹⁰

The statistical analysis controls for general political interest and an index of perceived normative pressures through significant others (“If I did not vote, my family/my friends would think badly of me.”). Both variables are theoretically ambiguous as they are likely to affect both spontaneous participation and cost–benefit calculus: political interest influences whether

⁹ I thank André Blais for generously sharing with me the data. For more information and previous analyses see Blais and Young (1999) and Blais (2000).

¹⁰ An extraction of iterated principal factors results in a one-factor solution that explains 43% of the variance (Cronbach’s alpha = 0.71).

citizens will define the situation as “election day” and is also associated with the civic duty norm which demands not only participating in elections, but doing so in an informed way. At the same time, political interest indicates a consumption benefit of voting and therefore constitutes an incentive in a rational-choice perspective. Similarly, perceived normative pressures through significant others could enter actors’ cost–benefit calculus as the expected costs of social sanctions (or the psychological costs of lying) in the case of abstention – but such perceptions could also be indicative of ego’s own subscription to the civic duty norm or of social influences that activate feelings of obligation in the weeks before the election.

The dependent variable is participation in the election as reported by the respondents in the week after the election ($n=976$). Whenever possible, independent variables are taken from the second wave that immediately preceded the election. Due to the research design, the analysis also controls for the university attended, participation in pre-election waves, and participation in a neutral presentation of the voting paradox (Blais and Young, 1999: 44).

4.4.3 Results

Survey data analyses that test hypotheses derived from the MFS should proceed in two steps. First, it is necessary to identify the subset of measured incentives that have explanatory power. Only for this subset can a meaningful test be conducted, else there is not enough statistical power to demonstrate that the impact of an incentive varies with a determinant of variable rationality (Aguinis and Stone-Romero, 1997). In the second step, product terms are added in order to test for the statistical interactions predicted by the MFS. This usually involves multiplying incentive measures with measures of script internalization, activation, or other determinants of actors’ variable rationality. The MFS predicts that the latter moderate the impact of incentives.

Model 1 in Table 4.2 represents the initial incentive model that includes all available incentive measures. The two product terms test whether the personal importance of who wins the election constitutes a greater motivation to participate, the closer the race is perceived to be. A positive interaction would indicate that citizens weight the utility of election outcomes with the likelihood to affect these outcomes. However, both coefficients are small and statistically insignificant, which rejects the view of voting as an *instrumentally* rational behavior (see already Blais and Young, 1999: 54).

In a stepwise fashion, I dropped these product terms as well as other incentive measures that were of negligible predictive power (or had coefficients whose signs contradicted an incentive interpretation).¹¹ In each step, likelihood ratio tests confirmed that the excluded variables did not significantly contribute to reducing deviance (see Hosmer and Lemeshow, 2000: 92ff.). In this process, I also combined two utility measures into an index in order to arrive at an incentive measure with greater explanatory power and hence at greater statistical power to test for its moderation. Building an unweighted index is statistically justified, as the variables have identical response scales and yielded nearly identical coefficients. A likelihood ratio test confirms that combining both variables does not significantly increase deviance.

¹¹ Such a model selection process risks capitalizing on chance characteristics of the sample (Hosmer and Lemeshow, 2000: 92). It should therefore stop before only statistically significant predictors are left. This is especially true as the MFS suggests that some incentive effects might not be visible until the subsamples of spontaneous and reflected decision-makers are identified (see Kroneberg *et al.*, 2010a).

Table 4.2 An initial incentive model of participation.

	Model 1	
Importance (national)	0.41	(0.47)
Closeness (national)	-0.61	(0.59)
Importance × closeness (national)	0.45	(0.74)
Importance (riding)	0.04	(0.33)
Closeness (riding)	0.16	(0.38)
Importance × closeness (riding)	0.22	(0.57)
Party identification	-0.02	(0.10)
Costs	-0.88 ^c	(0.19)
Civic duty norm	1.20 ^c	(0.27)
Political interest	0.37 ^a	(0.21)
Friends/family against abstention	0.47 ^b	(0.22)
Constant	-0.43	(0.42)
σ_{y^*} (std. dev. of latent disposition)	2.36	
Number of cases	628	
Pseudo R^2	0.252	
-2×log-likelihood	525.29	

Notes: Logistic regressions of self-reported participation in the 1993 Canadian federal election: y^* , standardized logit coefficients (β^{Sy^*}); standard errors in brackets. Additional control variables not shown are age, participation in the pre-election waves, exposure to a neutral presentation of the voting paradox, and belonging to the sample in Western Ontario.

^a $p < 0.10$.

^b $p < 0.05$.

^c $p < 0.01$ (two-sided tests).

Model 2 in Table 4.3 is the resulting reduced incentive model. Confirming theoretical expectations, the perceived costs affect reported participation negatively, while the perceived importance of the election outcomes has a positive effect. The perceived closeness in one's riding also seems to constitute a positive incentive for participation. Finally, there is a strong significant effect of the civic duty norm. These results are in line with rational-choice theories that stress the consumption benefits of voting: voters seem to weigh the perceived costs of participation against the warm glow that comes with expressing one's political preferences, feeling politically influential, and acting in accordance with one's perceptions of civic duty.

Model 3 goes beyond this view by testing the hypotheses derived from the MFS. To this end, the three measures of calculated incentives (importance, closeness, and costs) are multiplied with the civic duty measure. The signs of the coefficients confirm theoretical expectations: the civic duty norm interacts negatively with the positive incentives to participate (importance, closeness) but positively with the perceived costs, indicating that stronger feelings of civic duty reduce the impact of these incentives. A χ^2 -test shows that including these statistical interactions yields a statistically significant improvement in model fit ($p < 0.05$).

These results support the mixed-population explanation offered by the MFS: the perceived importance and closeness of the election as well as the perceived costs of participation exert strong effects on participation but only among those respondents with

Table 4.3 A reduced model of incentives and their statistical interaction with the internalization of the civic duty norm.

	Model 2		Model 3	
Civic duty norm	1.28 ^c	(0.26)	1.61 ^a	(0.96)
Importance (index)	0.66 ^c	(0.23)	1.65 ^a	(0.91)
Closeness (riding)	0.29 ^a	(0.17)	1.10	(0.70)
Costs	-0.93 ^c	(0.19)	-3.08 ^c	(0.89)
Importance × civic duty norm			-1.31	(1.17)
Closeness × civic duty norm			-1.07	(0.90)
Costs × civic duty norm			2.76 ^b	(1.10)
Political interest	0.34 ^a	(0.20)	0.37 ^a	(0.21)
Friends/family against abstention	0.45 ^b	(0.21)	0.50 ^b	(0.22)
Constant	-0.69 ^b	(0.28)	-0.90	(0.74)
σ_{y^*} (std. dev. of latent disposition)	2.33		2.36	
Number of cases	644	644		
Pseudo R^2	0.241	0.254		
-2×log-likelihood	544.46	535.47		
χ^2 -improvement (degrees of freedom)		8.99 ^b (3)		

Notes: Logistic regressions of self-reported participation in the 1993 Canadian federal election: y^* , standardized logit coefficients (β^{5y^*}); standard errors in brackets.

^a $p < 0.10$.

^b $p < 0.05$.

^c $p < 0.01$ (two-sided tests).

a low degree of norm internalization. Respondents who have internalized the civic duty norm to a maximum extent will participate in any case. Beyond this 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. Most importantly, 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. This fits well into the explanation offered here in which only some citizens participate or vote based on a deliberate calculus, as does the observation that empirically rational-choice theory can only account “for change at the margin” (Grofman, 1993: 103).

4.5 Applying the MFS to study social dynamics

Sociological theories of action should not only be able to derive hypotheses about the complex interplay of different determinants of action, but also be suitable to study social dynamics. Over and above descriptive accuracy, this task calls for analytical tractability. When analyzing complex social dynamics it is often useful, if not necessary, to make highly simplifying assumptions about the determinants of individual behavior. Indeed, as argued by

Hedström (2005), a simple desires–beliefs–opportunities scheme, known as DBO theory, often suffices. It enables analytical sociologists to study desire-, belief-, and opportunity-mediated social interactions in which the behavior of some actors influences the desires, beliefs, or opportunities of other actors and thereby their actions. Based on this simple setup, one can study generic types of social mechanisms, such as self-fulfilling prophecies, rational imitation, or vacancy chains (Hedström, 2005). However, the very simplicity of its conceptual apparatus allows DBO theory to capture only a restricted set of social dynamics. Due to its psychologically richer theoretical architecture, the MFS extends the arsenal of analytical sociology. The behavior of some actors can lead others to redefine the situation, to activate a particular script, or to switch from a spontaneous mode of selection to a reflected one in which formerly taken-for-granted ways of thinking and acting become the object of deliberation. While the possibilities to apply the MFS to the study of social dynamics are manifold, I can sketch here only how such applications might look and what insights might be gained from them. I first turn to the study of social movements and collective action and then provide a more detailed game-theoretic example from economic sociology.

4.5.1 The MFS and the study of social movements and collective action

The framing perspective has already been highly influential in the study of social movements. It claims that the mobilization of social movements depends on the way in which different actors interactively construct a shared meaning of the movement's concerns and goals. However, as one of its main proponents admits, the framing perspective has been hampered by a lack of precise microfoundations (Benford, 1997). This has led to a predominance of purely descriptive studies and to a limited explanatory power, especially when compared to rational-choice theories (Benford, 1997). The MFS could serve to ground the study of social framing processes in an explicit theory of action (see already Schnabel, 2006). As an example, take the claim that those “collective action frames” are likely to become widely adopted that are both credible and salient (Benford and Snow, 2000: 619–622). The notions of credibility and saliency are easily translated into parameters of the MFS: the adoption of a frame depends on its match (in the spontaneous mode) or the expectation that it constitutes the most appropriate interpretation of the situation (in the reflected mode). In both cases, a frame is “credible” to the extent that situational objects signal its appropriateness and “salient” to the extent that it is chronically accessible due to previous social learning and influence processes. Instead of focusing on these factors in isolation (and relegating incentives, resources, and the like to other “theoretical perspectives”), the MFS would allow researchers to study their interplay with other determinants of behavior and to identify the conditions under which they are more or less explanatorily relevant.

More generally, application of the MFS could yield new insights into collective action problems. As noted by Baldassarri (2009: 401–402), doubts about the adequacy and sufficiency of rational-choice theory call for “an alternative micro foundation for collective-action phenomena” which would allow analysis of the interplay of identity and interests as well as their activation and change in social interaction processes (Baldassarri, 2009: 402; Schnabel, 2006). Among other things, the MFS might contribute to this task by opening up the black box of unconditional cooperators. Many actors decide about whether and how much to contribute to a public good based on what (they think) other actors will contribute. In contrast, unconditional cooperators are resistant to such influences and contribute even if nobody else does. The existence of even a small share of such actors can have significant

macro-level consequences: they may provide the critical mass necessary to trigger a self-reinforcing process of rising cooperation rates and therefore decide over the success of a collective action and, more generally, affect whether, how fast, and how many equilibria are reached (Rolfe, 2009: 429). While it is not uncommon to assume a fraction of actors to cooperate unconditionally, the theoretical rationale to do so is often unclear or even consists of vague references to “innovators,” “zealots,” and the like. As a theory of variable rationality, the MFS allows us to explain that a particular set of actors will cooperate unconditionally due to a spontaneous mode of action. In empirical studies, this could help to identify those individuals, using more or less direct indicators of actors’ participatory scripts, their activation, the situational match of underlying frames, or the opportunities and motivation to reflect. Moreover, based on the MFS, it becomes possible to endogenize the share of unconditional actors. As an unintended consequence or by strategic manipulation, the actions of one set of actors might have symbolic external effects and change the situational definitions of another set of actors, (de)activate particular behavioral dispositions, or affect the motivation to reflect. Hence, some actors who have cooperated unconditionally in the early periods of a social process might switch to a conditional decision making in later periods, due to changing from a spontaneous to a reflected mode of information processing (or vice versa).

4.5.2 Strategic interaction with variable rationality and framing

The value of the MFS consists not just of basing verbal theoretical accounts on a more explicit theory of action. Rather, analytical sociologists can exploit the formalized nature of the MFS when modeling how macro-phenomena emerge from interaction processes between several actors. While the MFS can also be used in agent-based models (Lücke, Weyer, and Fink, 2013), I now consider the example of a game-theoretic model that makes use of ideas elaborated in the MFS.

Montgomery (1998) developed a game-theoretic model to explain patterns of cooperation observed in the New York City garment industry. The underlying exchanges are conceptualized as bilateral, finitely repeated Prisoner’s Dilemmas. The innovation of the model lies in the assumption that each exchange partner can play two distinct roles, that of a businessperson or that of a friend. The latter cooperates unconditionally, whereas the former maximizes profit. 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 friends will automatically adhere to this norm. The business script comprises profit maximization, which requires that the player identifies and chooses an optimal course of action. Since the script cannot specify in advance which particular action should be selected, the player has to choose in the rc-mode.

In Montgomery’s model, the role switch is governed by a meta-rule, for example, “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, such a meta-rule corresponds to the associative links between situational objects and frames: player i ’s previous behavior determines player j ’s definition of the situation in the as-mode. Montgomery’s model assumes that the pattern of behavior described by the meta-rule will lead either to a perfect match of the friendship frame or to a perfect match of the business frame. The MFS allows one to recognize the simplifying character of these assumptions and offers various extensions, for

example, by introducing variation in the chronic accessibility of frames or in the degree to which the significant situational objects are present.

As stated above, a player will only select an action in the rc-mode if the business frame and script are activated. Only then will a player have foresight and take into account 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 one player’s 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: he or she will either simply defect throughout the entire game (as the other player will do in this case) or follow a turn-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 or she (still being a business person) will defect, taking advantage of the other player’s unconditional cooperation. Comparing the payoffs from these kinds of strategies yields equilibria in pure and mixed strategies that mirror the empirical 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 based on the MFS shows 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 social mechanisms. In applications of the MFS, several parameters or even selections can be left out, for example, because opportunities for reflection are abundant ($p = 1$), the definition of the situation is unproblematic ($m_i = 1$), or there is just one script associated with a particular frame, as in most everyday situations ($a_{ji} = 0$ for all but one script). Explicating such simplifying assumptions may seem cumbersome but is certainly worthwhile, as an empirically valid theory of action will greatly help in achieving a realistic understanding of the social mechanisms at work as well as their scope conditions.

4.6 Conclusion

The model of frame selection (MFS) answers Jon Elster’s call for “a formal model of the interaction between rational and nonrational concerns that would allow us to deduce specific implications for behavior” (Elster, 2000: 692). The MFS focuses on the definition of the situation, the activation of a program of action, and action itself, assuming that each can follow two different modes of selection. In the reflecting–calculating mode an actor deliberates on a greater set of alternatives and incentives, whereas in the automatic–spontaneous mode the actor selects a certain alternative based on strongly anchored mental models and situational cues without considering other alternatives or incentives. Extending the well-known notion of bounded rationality, the MFS is a theory of *variable rationality*: following dual-systems theories in psychology, it directs attention to the different respects in which behavior is governed by spontaneously activated mental models or based on deliberate choice across actors and situations.

The MFS is not alone in its attempt to equip the social sciences with a more realistic theory of action. Within rational-choice theory, innovative model architectures incorporate situationally activated identities and actors’ interpretations of their situation among the core concepts of the theory (Akerlof and Kranton, 2000; Bicchieri, 2006). Others even suggest

going beyond explaining behavior solely in terms of maximizing expected utility under constraints – thereby substituting rational-choice theory with a more general and psychologically richer theory of action (Lindenberg, 2008; Wikström, 2006; Boudon, 1996).¹² While the MFS shares this latter theoretical agenda, it possesses the comparative advantage of constituting a formalized theory of action. This feature makes the MFS particularly attractive for analytical sociology. First, scholars can apply the model to formally derive specific hypotheses about the interplay of different determinants of action (see Section 4.3; for a formal derivation of three-way interactions, see Kroneberg, 2011b; Rompf, 2012). As I have illustrated, this hypothesis-generating power allows the MFS to produce sociologically interesting explanations in a wide range of substantive fields. Second, by virtue of being formalized, the MFS allows researchers to systematically introduce simplifying assumptions. The MFS just provides the theoretical option for highly differentiated analyses of individual behavior. In applications, it is possible, and often sufficient, to consider extremely reduced versions of the model. 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" (Lindenberg, 1992: 6). By satisfying this criterion of modularity, the MFS secures analytical tractability in applications that primarily focus on complex bottom-up dynamics. For example, the game-theoretic model of socially embedded exchanges reviewed above (Montgomery, 1998) assumes that exactly one script is fused with a particular frame, so that the script selection is not part of the analysis (for an agent-based model, see Lücke, Weyer, and Fink, 2013). Depending on the application at hand, different parts of the MFS will be relevant. Instead of a proliferation of behavioral rules of unknown scope conditions, the complexity of the MFS offers a common action-theoretic core that guides and unifies various analyses.

Substantively, the MFS supplements and integrates the study of incentives and opportunities with theoretical arguments about actors' frames and scripts and their variable rationality across situations. These concepts resonate well with influential theoretical movements that aim at re-establishing the importance of institutions, ideologies, and culture for the study of social reality, for example, the various forms of new institutionalism that have become prominent in the social sciences (DiMaggio and Powell, 1991; Nee, 1998; March and Olsen, 1989; North, 1990) or recent innovations in cultural and cognitive sociology (Swidler, 1986; Small, Harding, and Lamont, 2010; Young, 2010; Cerulo, 2010; DiMaggio, 1997). The MFS therefore opens up new opportunities for a theoretical dialog between more culturalist sociological approaches and analytical sociology (see Gross, 2009; Manzo, 2010). Most importantly, it can help to overcome the theoretical divide between culturalist–normativist and rational-choice approaches that still characterizes many fields of sociological research and to arrive at more comprehensive explanations.

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¹² A particularly great overlap in assumptions and hypotheses exists between the MFS and Wikström's situational action theory of moral rule-breaking (Wikström, 2006) which likewise delineates a perception-choice process and incorporates dual processes (on these similarities see Kroneberg *et al.*, 2010a; Messner, 2012).

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Further reading

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