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ORIGINAL ARTICLE

(Ex)Change of Routines: An Action-Based Microfoundation

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Abstract Change necessitates companies to alter their established routines. But how flexible are routines, and how can they be changed? Research has given very different answers to this question. While some researchers see routines as rigid and opposed to change, others see them as flexible and a source of change. The problem is not only that these positions are unrelated, but that there is no foundation that conceptually encompasses and connects both elements of routines, rigidity and changeability, which is why these two facets currently present as opposites. Current research tends towards the second position, neglecting the rigidity of routines. This paper offers an action-based microfoundation of routine change expanding Feldman and Pentland's ostensive-performative approach beyond feedback processes. The focus of the theoretical conceptualization of routines is on action-specific knowledge acquired and applied through repetition. This action-based microfoundation allows the contradictory views of previous research to be positioned in a larger context. Routines are flexible, but only incrementally; they exhibit rigidity towards radical change. Building on this theoretical conceptualization, this paper distinguishes four types of routine changes: routinization/expansion, adaptation, problem fixing, and deliberate routine exchange. This distinction can contribute significantly to the focus of research and thus make it more rigorous. It also allows the rigidities of routines to be taken into account more strongly than before, thereby significantly increasing the relevance of routine research.

Keywords Routine · Micro foundation · Action · Inflexibility · Inertia

JEL Classification D01 · O12 · O31 · M20

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1 Introduction

Many researchers are convinced that routines play a significant role in organizational change. One main reason for this is that business activities are largely based on routines. Teece et al. (1997, p. 518) write, "By managerial and organizational processes, we refer to the way things are done in the firm, or what might be referred to as its routines." In this sense, "Nelson and Winter (1982) argue that the skills and capabilities of organizations are bound up in their routines for accomplishing tasks" (Rumelt 1995, p. 106). Changing a company means changing its routines.

However, there is disagreement regarding what role routines play in change and what it means to change routines. On one side of the spectrum, researchers see routines as inflexible, a source of inertia (Hannan and Freeman 1984; Rumelt 1995). More than just rigid, routines, once established, tend to persist (Betsch et al. 2004). Routines become an opponent of change; innovation means overcoming the resistance of existing routines (Schumpeter 1934). At the opposite end of the spectrum are Feldman and colleagues. They not only view routines as changeable, but as constantly changing, driven by feedback processes (Feldman 2000; Pentland and Feldman 2005). Routines are thereby a "source of flexibility and change" (Feldman and Pentland 2003). Accordingly, the focus of this research is the investigation of routine dynamics (Feldman 2021; Feldman et al. 2016). Both positions stand side by side, largely unconnected.

Currently, the pendulum is clearly swinging in Feldman and colleagues' favor. Routine research has largely ceased investigating routine rigidity, neglecting an essential potential of the routine construct and thus an equally essential aspect for the investigation of change, challenges and resistance. Behind this lies a deeper problem: there is no foundation that conceptually encompasses and connects both elements of routines, rigidity and changeability, which is why these two facets currently present as opposites. Above all, Feldman's ostensive-performative approach hardly allows for the modeling of rigidities.

The aim of this conceptual study is to create a synthesis between these two approaches by means of a comprehensive action-based microfoundation. In this way, routine rigidity and the difficulties it poses for change should be brought back into focus while keeping sight of the possibilities for changing routines. This assumes that routine changeability and rigidity are both significant and uncontradictory. There is an extent to which routines can be changed, but beyond that, they are rigid and persistent. This paper intends to extend the work of Feldman and Pentland, retaining the ostensive-performative concept but developing it well beyond feedback processes.

Microfoundations serve as a means to "unpack some of macro-management's preferred aggregate concepts (e.g., 'capabilities,' 'absorptive capacity,' 'routines,' and 'institutions') in terms of individual action and interaction" (De Massis and Foss 2018, p. 387). "Action-based" implies that the overall concept of the action is taken as the basis for the microfoundation; routines are just one of several elements of action and can be positioned within this framework. This also allows us to examine the interaction between routines and other elements of action (e.g., rationality, intuition, or emotion). Contrary to Feldman and Pentland, I define routines as the ability to use

action-specific knowledge previously acquired through repetition to make decisions. The synthesis entails situating and interrelating both dimensions of routines, namely their rigidity and changeability, within a comprehensive framework.

In this paper, the action-based concept is introduced, and the emergence of routine within this framework is explained. The basis for the development of routine is the action-specific knowledge acquired as part of the repetition of the action and leads to an improvement in the results while reducing the need for planning. On this basis, different types of routine change are identified and differentiated in this study: routinization and expansion, adaptation, problem fixing, and deliberate routine exchange. First, however, a look at the literature will show how the understanding of routine change has developed over time.

As a result, this study contributes to the scientific discourse on routines as follows: first, it brings focus back to routine to better understand the difficulties of innovation and appeals for a return to closer examination of these topics. Second, with the action-based approach, a completely new, comprehensive microfoundation is presented that allows both routines' rigidity and changeability to be integrated into a comprehensive concept. Third, it presents a typology that allows routine changes to be differentiated and thus better understood. As a result, this study proposes a new conceptual understanding of the phenomenon on the cognitive level as action-specific knowledge rather than on the performative level as an action pattern.

2 Background

It is less known, but already Schumpeter (1934) and (1994) had a distinct idea of routine. For him, routine is an embodiment of the orderly course of things in the "circular flow" of an economy, as the "running of an established business ... is largely a matter of routine" (Schumpeter 1934, p. 91). The focus of Schumpeter's work lies in examining the challenges of innovation and how to overcome these through entrepreneurship. For Schumpeter, innovation means overcoming the inertia embodied in the established routine: "Where the boundaries of routine stop, many people can go no further, and the rest can do so only in a high variable manner" (Schumpeter 1934, p. 80). However, Schumpeter's notion of the concept of routine was an informal one that long preceded the development of the behavioral decision theory.

A conceptual foundation of routine is then undertaken primarily by Simon (1947) and further developed by March and Simon (1958) and Cyert and March (1963). This is strongly oriented towards decision theory: "Administrative Behavior was written on the assumption that decision-making processes hold the key to understanding organizations" (Simon 1947, p. x). This early phase describes some essential elements of routine. The main reasons for the formation of routines are identified as: the need to save deliberation effort and reduce complexity; efficiency gains from increased automation of highly routine actions; and rapidity of task execution as triggered by stimuli (stimulus-response relationship). The essential characteristics of routines are further described as: (i) uncertainty avoidance, (ii) persistence, and

(iii) simplicity (= saving of deliberation necessity). Persistence is notably associated with organizational stability.

Evolutionary economics regards routines as the essence of business conduct. According to Nelson and Winter, "the behavior of firms can be explained by the routines that they employ. Knowledge of the routines is the heart of understanding behaviour. Modelling firms means modelling the routines and how they change over time" (Nelson and Winter 1982, p. 128). In this context, it is important that "the flexibility of routinized behavior is of limited scope" (Nelson and Winter 1982, p. 400). Borrowing from the biological theory of evolution, Nelson and Winter compare routines to genes that require mutation to change. In contrast to Simon and March, routines and especially the creation of new routines are explained less by rational choice and more by search, trial and error (Nelson and Winter 1982), and meta-routines, i.e., routines that serve to changing existing routines (Winter 2003).

The difficulties of corporate change and the role that routines play in this is then addressed by the inertia literature. "[I]nertia is the natural state of affair—firms can only do what they have routines for doing. Lacking a routine for a new task, the new task does not really get done" (Rumelt 1995, p. 106). This thought is later taken up by the dynamic capabilities approach (Teece et al. 1997) insofar as it examines which special skills are required to change routines.

Up to this point, the literature generally characterizes routines as relatively inflexible, and achieving routine change, as conceived by Schumpeter, requires special efforts to overcome this rigidity. Feldman and Pentland (2003, p. 97) therefore rightly characterize this research as having "an image of routines as relatively fixed, unchanging objects." The focus of evolutionary economics is more on the investigation of the role than the structure of routines, which largely remains a black box. According to Cohen, et al., "'Routine' seems destined to be a keyword in a large number of papers appearing in the mid-nineties. But examining the papers shows little progress so far in reaching agreement on what routines are—and therefore on how or why social scientists should study them" (Cohen et al. 1996, p. 656).

Increasing interest led to an upswing in the routine literature in the 1990s, with two approaches deserving special mention. The first approach is that of Pentland and Rueter, conceptualizing routine as "grammars of action," thereby establishing an analogy between routine and language (Pentland 1995; Pentland and Rueter 1994). Routines are comparable to sentences, with words "a set of basic moves" (Pentland 1995, p. 544) and grammar dictating how the words "can be combined … to create sentences" (Pentland 1995, p. 545). The basic idea is that routines build on action-specific knowledge, which corresponds to the idea of routines as "organizational memory" in Nelson and Winter (1982). However, this knowledge refers not only to the routine as a single unit but also its components (the "basic moves"). Routines allow these components to be recombined according to certain rules (the "grammar"), that is, routines can be changed, but only within certain limits. In the words of Pentland and Rueter, "An organizational routine is not a single pattern but, rather, a set of possible patterns—enabled and constrained by a variety of organizational, social, physical and cognitive structures-from which organizational members enact particular performances" (Pentland and Rueter 1994, p. 491). This notion is

reflected below in the relationship between an action and routine adaptation. The exact structure of the moves, however, remains unclear.

Second, there is the ostensive-performative approach originally formulated by Feldman (2000) and subsequently further developed in numerous papers. This approach goes back to a field study in which Feldman sought to examine real routines with the aim "to study what factors contribute to this stability" (Feldman 2000, p. 611). This is one of the first studies to investigate the black box of routines with empirical data. The results of this study contradicted what Feldman had expected: "Indeed, I found that most of the routines I was studying were undergoing substantial change. This discrepancy between the concept and the observations raises questions" (Feldman 2000, p. 611). Feldman conceptualizes routines as standard organizational processes, the change of which is essentially driven by two decisive elements, namely, the ostensive and performative aspects, which can be described as follows: "The ostensive aspect of a routine is the abstract or generalized pattern of the routine … Performances are the specific actions taken by specific people at specific times when they are engaged in what they think of organizational routine" (Pentland and Feldman 2005, p. 796). In short, the ostensive refers to the planned, desired routine, and the performative refers to the actual execution of the routine. These two elements are in constant interaction. A discrepancy between reality and imagination can lead people to question and modify routines. Routines are not only changeable, they change inherently in the course of their use, thus becoming a "source of flexibility and change" in organizations (Feldman and Pentland 2003).

Feldman and Pentland (2003, p. 95) define routines as "repetitive, recognizable patterns of interdependent actions, carried out by multiple actors," and we can infer from this that routines are limited to organizational processes, and individuals cannot have routines. Routines are conceptualized at the appearance level as "patterns" with "the routine" specified as a subject (rather than a property). This is likely the most widely accepted definition of routines today. However, I will question this critically below.

This conceptual grasp of routines and the ostensive–performative approach dominate current research. The focus is on examining different aspects of routine change, such as reflective talk in routine change (Dittrich et al. 2016), vicarious group learning (Bresman 2013), intentionality in routine dynamics (Dittrich and Seidl 2018), and performance feedback (Oehler et al. 2019) to name a few. The special issue on routine dynamics published in Organization Science (Feldman et al. 2016) and the Cambridge Handbook of Routine Dynamics (Feldman 2021) provide good insight into the mainstream routine research.

This research undoubtedly provides important insights into the functioning and meaning of routine. It was right and important to open the black box, and Feldman and colleagues also did well to bring "agency … back into the picture" (Feldman and Pentland 2003, p. 95). The problem, however, is that Feldman and colleagues went too far. In doing so, they have not even fundamentally rejected the inflexibility and the tendency towards persistence of routines and have themselves admitted that "routines can be a source of inertia and inflexibility" (Feldman and Pentland 2003, p. 94); however, they have completely lost sight of them. This drives this research to the point of understanding even inertia as a 'source of organizational variation'

(Yi et al. 2016). As a result, the perception of routine as an antagonist of innovation has largely been lost. This has two main consequences:

- First, it limits the explanatory power of the routine concept, because an essential potential of the concept remains unexploited.
- Second, an important explanation of inflexibility and inertia and the difficulties of change (the focus of interest for Schumpeter) is missing.

A major reason for neglecting inertia and inflexibility is the narrowness of the performative-ostensive approach, which is limited to the investigation of feedback processes and makes no conceptual connection to decision theory. It thus remains in an organizational, anti-rational attitude, which, though once fitting as the opposite of rational choice, is now outdated. To study change in routines, it is necessary to step outside the routine itself and examine it from a broader perspective. The point is to grasp which forces act on routines from the outside and how these fit into the wider framework. The concept of action offers such a framework.

3 An Action-Based Approach to Routines

There is no serious doubt that routine relates to action and that there is a close connection between the two constructs. Accordingly, the concept of action is regularly used in routine research. Feldman et al. (2016, p. 506) assume that "routines are enacted in specific times and places." Feldman and Pentland (2003, p. 95) define routines as "patterns of interdependent actions," and Pentland and Rueter (1994, p. 484) understand routines as a "grammar of action;" however, there is no recognized definition or independent conceptualization of action in routine research, and the relationship between routines and action remains unclear. Are routines a specific form of action, or are they composed of different actions? How exactly do routines differ from actions? There is a problematic gap in the research here. Furthermore, it remains unclear what it means to repeat an action. This is where the action-based approach comes in.

3.1 Action and Repetition as Foundations of Routines

The action-based approach builds on a concept of action based on Von Wright's (1971) theory of action. Accordingly, actions are characterized by the fact that people (or groups of people) wish to achieve something specific through their actions, i.e., their actions follow intention. This is a teleological understanding of the term, and an action therefore includes all activities undertaken to achieve a certain intended state. I introduce the concept of action in greater detail here because action is the framework in which routines are developed and used. The elements of action presented here all affect routines and are therefore of particular importance for understanding routines' shape as well as how they change.

The *intention* is the aim of an actor to bring about a certain state (Kesting 2006), i.e., the purpose of the action. The intention itself is only the starting point of the action. In order to act, agents must decide what steps to take to pursue their

intention. Moreover, they must implement their decisions and carry out the acts. Only these three elements together form the complete action; technically, the action therefore becomes a triple: [intention; decision; performance]. Intention not followed by decision and performance is only an inconsequential wanting, but if the action is performed, it must be based on any kind of decision. Action is a unit of analysis because its three elements relate to one another.

The *decision* connects the two elements of intention and performance. It determines what steps the actor wants to take in order to achieve the intended state. In classic decision theory, it is assumed that this determination is based on a rational decision-making process (Rubinstein 1998). The three elements of conscious choice, alternatives, preferences, and rationality, thus represent an integral part of action.

However, more recent research also takes into account that rationality is bounded, information is incomplete, and processing capacities are limited (Conlisk 1996). Rationality is thus relative to these limitations. In this context, the concept of satisficing is particularly relevant to the acquisition and application of action-specific knowledge, one of the core elements of routines. Satisficing refers to actors stopping the search for alternatives when they expect that the effort for additional search outweighs the potential benefits (Simon 1955). In this way, bounded rational theory offers an explanation of why actors can miss optimal alternatives when making their decisions—and why this can even be (bounded) rational.

There has also been extensive research on the non-rational elements of decision making, such as intuition (Klein 2004) and emotion (Lerner et al. 2015). In this context, the distinction of the dual process theory between system 1 (automatic, rapid, and effortless, like intuition) and system 2 (voluntary, effortful, and controlled, like deliberate planning) of information processing (Kahneman 2003) is particularly relevant. This research shows the complexity of action taking beyond rationality and relates different drivers of human action in a broader context.

One of the central findings of research is that there are a large number of procedures for making decisions, i.e., determining how a specific goal can be achieved. These affect behavior differently, i.e., people act differently when making a decision emotionally as opposed to rationally. The goal of the action-based approach is to position routines in this context.

The *performance* then includes everything actually done by the actor to bring about the intended state. In this way, the performance is teleologically conditioned by the intention. However, it is also possible that the intended state cannot be achieved by the performance. In this case, the act was not successful. The designation of the third element of the triple as performance is based on Feldman (2000).

After the actors have taken steps to pursue the intention, i.e., after they have performed the act, the act is terminated. An action is therefore limited and can be identified as a unit and distinguished from other actions. This is particularly important in understanding what it means to repeat an action.

To gain a full understanding of action and routines, it is important to be aware that action is not a linear process with an intention inducing planning which then leads to operations. As Dittrich and Seidl (2018) (among numerous others) have emphasized, actors can continue planning and decision making throughout the performance of the act, and intentions can be adapted and changed in this process as well. Actors must

fill planning gaps and react to unexpected challenges and planning errors (Betsch et al. 2001). Therefore, the intention, decision making, and performance typically interact with one another. Additionally, there can be several simultaneous intentions. This complicates matters but does not change the principle.

There are a great many concepts of action in the literature, and the term action is also used differently in everyday language, making the use of the term somewhat problematic. Regardless, there is no doubt that there is a teleologically causal connection between the elements of the triple [intention; decisions; performance] and that they can be thought of as a unit. The designation of this triple as an action does not seem to fundamentally contradict the language usage. The great advantage of the concept of action based on Von Wright (1971) is its inclusivity, as it allows routines to be positioned in the framework of action and the forces that act on routines from the outside. This is done in the following section.

The concept of action is also well suited to conceptualize repetition, which is perhaps one of the weakest points of routine research to date. While there is agreement that repetition is central to routines, a more precise conceptualization is lacking. In the routines literature, the phenomenon of repetition has been primarily described with intuitive terms such as "rounds" (Feldman 2000, p. 623) or "pattern" (Feldman and Pentland 2003).

In more recent literature, repetition is associated with a stable intention (Dittrich and Seidl 2018), i.e., agents carry out activities repeatedly to pursue the same aim. While this is an essential aspect, it is insufficient to conceptualize repetition precisely. The context must also remain stable; then and only then does the decision problem remain stable. Repeating an action is to perform a second action that follows the same (or very similar) intention in an identical (or very similar) context. Repetition is thus conceptualized in terms of the decision problem rather than the execution of the action. Understood in this way, the repetition of an action has a special consequence in that it allows the acquisition and use of action-specific knowledge. The crucial point here is that all knowledge and considerations of an action also apply to its repetition in full. This will be explained in greater detail below.

3.2 The Acquisition and Use of Action-Specific Knowledge

Routine is acquired through repetition (Betsch et al. 2001). Consequently, the first act has no routine to build upon. (It should be noted that this concept of a "first act" is fictional, as there is always some previous solution to build upon. However, it is a good starting point for explaining the development of routine.) In this case, actors must determine how to implement the intention from the ground up, as is the case of what classical decision theory is all about (Jeffrey 1965). However, if the action is repeated, the situation changes radically.

As outlined above, repeating an action means to pursue the same (or very similar) intention in the same (or very similar) context again. In this case, actors are facing the same (or a very similar) decision problem. However, the main difference is that when acting the second time, agents have already performed the same act before. Consequently, they were able to acquire act-specific knowledge: in the course of planning the previous action, agents already have identified alternatives, specified

and compared them. They have discussed scenarios and made decisions. Actors might have documented this knowledge in artefacts (Pentland and Feldman 2008) like decision protocols, minutes, guidelines, etc.

Additionally, actors also have already performed the act. They could observe everything they did (also beyond the previous plans) to pursue the intention, including unexpected problems they met on the way and additional decisions they made during the performance of the act. We might call this total of all activities carried out to pursue an intention a "comprehensive performance." Moreover, the actors could observe the outcome of the act, if and how they were able to pursue their intention. This makes a huge difference, as actors could only guess the results when performing the act for the first time. Now they know what their action taking is leading to, at least for one case.

When taking the same act the second time, actors can build on this act-specific knowledge in two different ways: first, they can improve, avoid mistakes, question old solutions, and look for new ones, a process driven by feedback and adaptation of decisions in consequence of that as described in Feldman (2000). Alternatively, actors utilize their act-specific knowledge by applying previous solutions to the current problem (Betsch et al. 2001). This application of previous solutions to current problems is central for the understanding of routines and requires further elaboration.

Feedback can indicate a need for further improvement; however, it can also indicate that no further improvement of a solution is needed. In this case, actors have the opportunity to refrain from further planning and apply the previous solution to the current act just as it is. Solutions are elements of the comprehensive performance, basically every aspect of it that can be named and changed. This judgement—that no further improvement is needed—follows again a satisficing principle (Simon 1979). According to this principle, actors refrain from planning when the expected gains from additional planning do not pay off the planning effort. This way, the planning effort can be reduced considerably for the repetition; opportunities do not need to be identified, specified, and compared again; instead, only an existing solution needs to be memorized and fit into the comprehensive performance. However, satisficing, again, does not mean that no better solution exists. The application of previous solutions to current problems can therefore be understood as a strategy to reduce the planning effort; for unbounded rationality it would make no sense.

Let me illustrate this with an example: a consulting company is developing a new negotiation training, offered to middle managers of larger firms. The first act in this example is the first training performed with the customers. People familiar with training know that conceptualizing a new training causes a lot of effort, particularly when there is little or no previous experience with negotiation trainings (which characterizes a first act). The learning content must be defined, current research be reviewed, textbooks selected, etc. On top, a pedagogical concept must be developed, exercises must be found or created, examples found to illustrate research findings, etc.

Repeating the act means to perform a similar training again for a similar audience in a similar context. Now the trainers can build on the specific knowledge that they have acquired in result of the planning and performance of the first workshop, including the feedback by the participants. Running the training the second time,

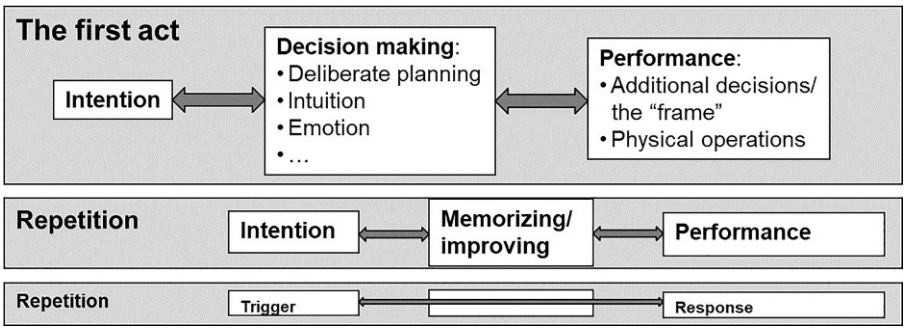

Fig. 1 Stages of the acquisition and application of action-specific knowledge in the course of repetition

trainers have to opportunity to improve some solutions of the first training, continue planning, and find better solutions, for example for the exercise of the third unit of the training on value creation with which they were not satisfied with the first training. But they also can leave solutions unchanged and repeat them in the second training just like they were in the first training, for example PowerPoints 5–11 on the second teaching unit on value claiming. Reviewing the research, conceptualizing, and writing the PowerPoints can easily have taken several hours. Updating and adapting the PowerPoints might have been done in minutes.

This example also illustrates the concept of the solution. Solutions include: the overall concept of the training; its structure, its teaching units; exercises; single PowerPoints; and all other aspects of the comprehensive performance—the negotiation training—that can be named and changed. Solutions can overlap and their complexity can differ substantially. The key is that they can either be re-conceptualized or taken as they are in the repetition.

With increasing repetitions, the act-specific knowledge tends to increase, feedback tends to lead to further improvements and agents tend to find more satisfying solutions.

Another effect described in the literature is that taking actions can be automated. Solutions are not memorized and deliberately performed (and reflected) anymore, but actors just call up an action sub-consciously. Simon (1947) has characterized fully automated actions as "trigger-response" relations. This will barely happen for a complex action like a training. However, it can happen for more simple and highly repetitive actions, like commuting to the workplace; here, actors might not involve in any planning or reflection activities anymore as long as the performance of the action is not disturbed.

Figure 1 summarizes the different stages of the acquisition and application of action-specific knowledge from the first act via memorizing and improvement of solutions in the course of repetition toward the fully automated trigger-response action.

This is the scenario in which routine is located. Qualifying routines via interaction patterns obviously makes little sense here. It is in the nature of repetition that repeated actions follow certain patterns, but this is a superficial observation. Rather, the crucial process is the acquisition and use of action-specific knowledge in the

course of repetition. This is the prerequisite for the development of satisfactory solutions. I therefore propose to *define* routine as the ability to use action-specific knowledge previously acquired through repetition to make decisions. Routine can be perceived as primarily a skill that actors can acquire. As shown above, this is a gradual process that occurs as the action repeats, and actions are thus more or less controlled by routine. Against this background, it is also possible to define a routine as an action that is somewhat strongly controlled by action-specific knowledge. This notion is closer to that of Feldman and Pentland (2003) and quite practical for usage, albeit rather informally, because it requires a distinction between a routine and non-routine that is problematic to qualify.

3.3 Organizational Routine

So far, I have tacitly assumed that actions are performed by individuals. However, actions can also be carried out by organizations. In organizations, goals can be formulated to be achieved collectively, decisions can be made collaboratively and actions carried out together. Participants in the organization can acquire action-specific knowledge and use it as part of the action repetition. Processes can also be automated in organizations, thereby reducing planning efforts.

Key differences is that in addition to the individual level, there is now also an organizational level of action taking (Dittrich et al. 2016). Since organizations have no physical memory, the acquisition of action-specific knowledge through repetition is based on the individual actors involved in the action (Felin and Hesterly 2007). However, this knowledge is distributed among the participating actors; for action taking, it must be coordinated. This is particularly the case for the feedback and improvement in the course of repetition. Action-specific knowledge can also be shared and stored in artefacts like manuals.

Decision making and performance of organizational actions can be and often are distributed between managers and (ordinary) employees (Kesting and Ulhøi 2010). Consequently, not all participating actors need to know the entire action. Additionally, the performance of organizational actions is also typically distributed among different, often specialized actors. Solutions need to be developed also for the coordination between the participating actors.

Summing up, organizational routines show many of the attributes of individual actions, but they are much more complex. Some actors join while others leave the organization so that the acquisition of action specific knowledge and automation of solutions can vary significantly between individual actors. Tasks, particularly decision making and performance, can be distributed between actors. Coordination and interaction cause new phenomena, also relevant for routine change.

4 Routine Change

The action-based model is particularly suited to distinguishing between different types of routine change. Such differences have been noted many times in the routine research. For example, Feldman (2000) distinguishes between “strive,” “repair,” and

"expand" with regard to change in routines, but the conceptual basis in this paper is insufficient to substantiate the observed differences. Other researchers, such as Dittrich et al. (2016), have also recognized such differences, but without capturing them conceptually. In the following, four different types of routine change are specified and differentiated: routinization, adaptation, expansion, problem fixing, and routine deliberate exchange.

4.1 Routinization and Expansion

Routinization is the process of routine development discussed above, characterized by the continued acquisition of action-specific knowledge resulting from feedback processes and the development and application of new solutions. This also includes expansion of routines (Cavalcante et al. 2011). The process can take a considerable amount of time. It not only affects the emergence of routines, but also becomes a driving force behind the change in existing routines. That is why (continued) routinization is also one of the drivers of routine change.

Of particular importance are the effects of routinization on action: First, it leads to a tendency to increase the efficiency of routines. In the course of repetition, actors find better solutions and avoid mistakes. Different solutions can be tried. Organizational members develop specific skills and automate processes. The coordination between the members of the organization becomes increasingly smooth. These developments have been captured in the concept of the learning curve and investigated intensively (Henderson 1984), albeit often unrelated to routinization.

Second, the increase of action-specific knowledge in the course of repetition leads to a tendency to decrease uncertainty. Some routine researchers have already pointed to that (Becker 2004). In the course of repetition, actors can observe results that they could only guess before. They can try out different solutions and observe the impact of context changes. After a while, actors understand structures well and are less surprised by things. Even though fundamental uncertainty can never fully overcome (Savage 1954), a fully developed routine perhaps comes as closest to the transformation of uncertainty into risk in a real-life setting as possible.

Third, the planning effort is decreasing in result of the increasing application of previous solutions to current repetitions (Betsch et al. 2001). As outlined above, an increasing share of solutions does not need to be developed anymore, but only memorized and adapted to the overall performance of the act (like the PowerPoints in the above example). In organizations, the decrease of planning needs have a special meaning: the saving of (scarce) management capacities (Penrose 1959). This is the case when the management is responsible for the development of new routines, but delegates their operation to lower levels (Kesting and Ulhøi 2010). Here we are facing a new dimension of the bounds of rationality—the limitations of management capacities (Hutzschenreuter and Horstkotte 2013).

Fourth, conscious reflection on the action tends to decrease over the course of repetition. Actors are less questioning their intention and identifying and comparing feasible alternatives anymore. This is an immediate consequence of the application of previous solutions and automation in consequence of that. On top, status quo biases (Samuelson and Zeckhauser 1988) and blinders of the dominant logic (Prahalad

2004) lead actors to focus on the routine as a target (Nelson and Winter 1982). These are psychological effects, closely connected to routines and further contributing to their persistence. As a consequence, routines are not fully adapted to the context and tend to become ineffective (Betsch et al. 2004).

All of these effects are necessary consequences of the acquisition of action-specific knowledge in the course of action repetition. At this point, Feldman and colleagues are correct that the execution of routines leads to tendencies toward change.

In addition, expansion refers to development of new application fields based on existing routines (Cavalcante et al. 2011). Additional solutions must be found to enable such an application. In our example, the training can be adapted for different target groups. As described by Pentland and Rueter (1994), routines thus become a "set of possible patterns."

To sum up, routinization is the process where actions turn into routines and routines acquire their specific characteristics, becoming efficient, familiar, and easy to operate, but inflexible and not fully adapted to the context at the same time. Key drivers of routinization are observation and feedback. Decision-making authority might be delegated during the process.

4.2 Adaptation

Adaptation means "to adjust and reconfigure routines in response to changes in the surrounding context" (Turner and Fern 2012, p. 1407). This phenomenon has been conceptualized by Pentland and Rueter (1994, p. 491) as "grammars of action": "An organizational routine is not a single pattern but, rather, a set of possible patterns-enabled and constrained by a variety of organizational, social, physical and cognitive structures-from which organizational members enact particular performances." It also resembles Simon's (1947) idea of routine decisions.

Substance of adaptation is that solutions (that have been developed in the course of repetition) can be combined in different ways. This allows for some performance flexibility while utilizing action-specific knowledge at the same time. New configurations might have required additional planning to develop in the beginning. However, once solutions have been developed for different configurations, acts can routinely be adapted to different parameters. In consequence, also the decisions for appropriate configurations can be routinized—they can turn into "routine decisions." In our example of the negotiation training above, adaptation might relate to time frames, focus topics, or target audiences of negotiation trainings.

However, variation is restricted by a prefixed structure; the underlying principle is comparable to that of the economic concept of the production function where variation is constrained by a rigid structure. As Pentland and Rueter (1994) point out, "members enact specific performances from among a constrained, but potentially large set of possibilities."

In summary, routines are not necessarily linear courses of action but can have a complex structure. They allow for some variation, but only within a given structures. This variation is also subject to routinization (routine decisions). Adaptation

is different from routinization as routinization consists in a development of new solutions, whereas adaptation is a variation within the given solutions.

4.3 Problem Fixing

Problem fixing is necessary when a firm wants to continue its routines but cannot perform it (or its performance is restricted) because previous solutions are not available anymore. This can happen after partners stopped the collaboration, licenses expired, employees left the firm, etc. In our example, the trainer specialized on negotiation might have left the consulting company. If the firm wants to continue its routines, it is necessary or advisable to "repair" it (Cacciatori 2012; Feldman 2000).

Like at routinization, problem fixing is based on the development of solutions in order to pursue an intention where previous solutions are not available or satisfying. The difference is that now (i) there is already a routine and (ii) the aim is to continue this routine. Consequently, the intention of the old routine and most of the solutions stay unchanged. Problem solving and choice do not regard the entire act but are restricted to solutions as elements of the overall performance.

To sum up, problem fixing is enforced by external causes. The actors need to become active to continue an existing routine in consequence of that. In contrast to the adaptation, existing solutions are not variated, but new solutions need to be found. In contrast to routinization, no new act is performed, but the performance of an existing routine is to be continued.

4.4 Deliberate Routine Exchange

Deliberate routine exchange means that actors do not want to continue their routines anymore like in the past, but to replace them by new routines. All other routine changes mentioned above mean that actors want to continue their existing routines and develop it, adapt it, or repair it. Now, existing solutions are deliberately abandoned, and new routines are being developed. Typically (but not necessarily) this goes along a changed intention and context. There is a lot of literature on various aspects of deliberate routine exchange—here I am going to highlight the essential characteristics of it.

In principle, to exchange their routine deliberately, actors can simply make new decisions. They face new decision problems, identify, and compare new alternatives, develop new solutions etc. like in the first act. However, taking into account that the actors' rationality is bounded, and actors have developed routines in the past, they will face two challenges: (i) they need to determine when to question their established routines and how to distribute scarce planning capacities and (ii) they face specific obstacles to change arising from the persistence of their established routines.

4.4.1 Distribution of Scarce Planning Capacities

Regarding the distribution of scarce planning capacities, actors are facing a fundamental challenge. As outlined above, the saving of planning capacities is an im-

portant characteristic of routines and the only reason to apply previous solutions to current problems and automate routines. However, this saving of planning capacities comes with a price, as routines are not fully monitored and not necessarily leading to optimal results. Are there better alternatives? It is not possible to answer this question systematically as the complexity of the so-called open world (Savage 1954) offers infinite alternatives at every point in time. Scarce planning capacities must be devoted to planning at a point where the benefit of the planning is not known (this is only known ex-post when the outcome of the planning is there). As a result, there is no systematic procedure to distribute scarce planning capacities and no general answer to the question of when and how to challenge the existing routine. At this point, actors must resort to heuristics or other guidelines to direct their action.

Research finds that actors challenge their routines when they perceive a divergence between the ostensive and performative aspect, significant enough to motivate the change (Feldman and Pentland 2003). According to this finding, deliberate change is guided by subjective perception, based on a satisficing principle. This requires additional explanations of what shapes the expectations of the actors, when the divergence is big enough to prompt action, and, above all, how these perceptions correspond to reality. How do firms deal with the fundamental challenges above? Inasmuch do they find the right point to question their routines?

There are strong indications that "the dominant logic embedded in an organisation may keep it on the road ahead, but it also acts as a blinder to peripheral vision" (Prahalad 2004). Actors tend to overlook opportunities and stay in their routine longer than good. In addition, change initiatives are not consistently implemented and existing routines defended. Existing routines are adapted to new intentions less than new intentions are adapted to existing routines. This is a downside when focusing on the routine as target (Nelson and Winter 1982).

4.4.2 Obstacles to Change

When it comes to deciding, there are many reasons to stick with the established routine. In comparison, breaking with the existing routine means: (i) increased planning effort as new solutions must be developed; (ii) poor performance at the beginning as actors start at the lower end of the learning curve; and (iii) high uncertainty, as actors cannot build on observations from previous actions. Therefore, it can be rational to stick to a routine even though there are better alternatives, simply because the switching costs are too high. This is the rational context of the persistence of routines (Samuelson and Zeckhauser 1988).

The obstacles to change are then rooted in the irrational motives that make routines to persist. Resistance to change has already been described by Schumpeter (1934). Nelson and Winter (1982) have characterized routines as truce; routines incorporate solutions that organizational members agreed on in the past, often balancing conflicting interests. Changing these routines challenges the balance. Individual actors can suffer substantial disadvantages from that (or they fear that they could, see Schumpeter 1934). Resistance is fired by the asymmetry of continuation and change. Because actors start at the lower end of the learning curve, their performance is poor, and actors make mistakes in the beginning. In contrast to the established routines,

the benefits of change are based on expectations, often believes for the future. A lack of success at the beginning plays into the hands of the opponent to sow doubt.

Two psychological mechanisms sustain the persistence of the routines: cognitive misconceptions, making actors weighting losses higher than gains in making decisions (Kahneman and Tversky 2000) and psychological commitment (Samuelson and Zeckhauser 1988). Together they cause so-called status quo biases, a tendency to get too caught up in existing routines.

The consequence is that routines are not fully adapted to the context and tend to persist. This inflexibility has been investigated intensively. It is one key element of the inertia literature (Henderson and Clark 1990).

To sum up, deliberate routine exchange is discontinuous. In contrast to the other types of routine change, the aim is not to continue the routine, but to replace it by another one. Deliberate routine exchange is therefore much more strategic, uncertain, and conflict laden. Here, the key characteristics of routines, lack of reflection and inflexibility, become particularly visible. Deliberate routine exchange therefore requires much more leadership skills than the other types of routine change.

4.5 Summary

Consequently, four different types of routine change can be distinguished. This distinction is necessary because the different types of routine (ex)change have different characteristics. Specifically, some routine change takes place against the background of an unaltered decision problem, while others are reactions to changes in the de-

Table 1 Overview of the four types of routine (ex)change

Change type	Routinization	Adaptation	Problem fixing	Revision
Characterization	Learning by doing, increasing replication	Routine decisions, adaptation of solutions	Development of new solutions to bring about an unchanged intention	Formulation of a new intention; development of new solutions
Decision problem	Unaltered	Extended	Unchanged intention, but changed context	Changed intention and/or changed context
Key drivers	Feedback, learning	Comprehensive knowledge	Decision making to enable continuation	Decision making to disrupt continuation
Tasks and key challenges	Feedback, improvement of solutions, development of new solutions	Appropriate configuration of complex routines	Planning, finding new solutions	Planning, finding, and development of new solutions, resistance, status quo biases, lack of reflection, planning effort, inefficiency, uncertainty
Responsibility	Transferred from management to operational levels in the course of the routinization	Primarily operational	Depending on the severity of the problem	Management

cision problem. Moreover, the drivers, the tasks, and central challenges as well as the responsibilities of change differ. Some key aspects of this distinction are summarized in Table 1. This distinction is relevant for a correct understanding and an adequate handling of routine change.

The distinction of routine types in Table 1 builds essentially on the action-based approach. Repetition and the stability of the decision problem define the setting. This is a prerequisite to conceptualize action-specific knowledge and the use of previous solutions to current problems. The conceptual distinction between the various routine types rests on these pillars.

5 Discussion

5.1 Theoretical Implications: Advancing the Ostensive-Performative Approach

The purpose of the action-based approach is not to replace the ostensive-performative approach, but to extend it. This can help make the analysis of routines and routine change (i) more precise and (ii) more comprehensive.

(i) The analysis is made more precise by first specifying the concept of action and the conceptual location of routines within the framework of action. Action is the outcome of the interplay of various elements, of which routine is just one. Rationality, conscious planning, routine, emotion, intuition, action, performance, decision-making, and so on, not only differ in their substance but also in their functions, which must be conceptually reflected. Having a theoretical framework is crucial to properly map these various elements and effectively capture how they interact with one another. I argue that the concept of action is well-suited for fulfilling this function. In the ostensive-performative model, where routine itself is the frame, such a framework is missing, making it impossible to adequately distinguish between the various mechanisms present.

A second key element is the concept of action repetition, which provides a conceptual foundation for investigating the development of routine. At the core of this concept lies action-specific knowledge and its impact on planning, particularly how it changes over the course of repetition. The effective utilization and enhancement of solutions are critical factors in this process. In contrast, the ostensive-performative approach lacks a microfoundation for understanding how routines are developed and overlooks the central role of action-specific knowledge.

Third, the definition of routine in this study, with reference to action-specific knowledge, makes a significant contribution to theoretical rigor. In this regard, I propose replacing the imprecise definition put forth by Feldman and Pentland (2003), which traces routines back to "patterns"—a term that lacks definition and conceptual development. This definition ties routines to just one of their many characteristics rather than the underlying mechanism responsible for their creation. Moreover, it contradicts everyday usage by limiting routines to interaction alone and failing to consider that individuals can also have routines. But most of all, defining routine as an "interaction pattern" does not allow for understanding routine and conscious decisions as alternatives or opposites. In the definition of Feldman and Pentland

(2003), conscious planning and rational decision-making are indeed components of routines. This does not allow for distinguishing between a routinized and a non-routinized action. The inadequacy of Feldman and Pentland's (2003) definition has been noted previously (Felin et al. 2012), and abandoning this definition would greatly benefit research in the field.

(ii) In addition, the action-based approach is more comprehensive than the ostensive-performative approach. It allows for the capture of both the changeability and rigidity of routines in a single theoretical perspective. Feedback processes also play a role in the action-based approach, turning routines into a source of continuous change there as well, while rigidities are theoretically captured through the limitation of rationality, the success of routines, and decision biases.

The action-based approach thus makes it possible to resolve the apparent contradictions between the various approaches and to position them: Hannan and Freeman (1984) and Rumelt (1995), for instance, highlight the difficulties of deliberate routine exchange and point to the inability of firms to change existing routines (deliberately) in the course of economic development, as already observed by Schumpeter (1934). Pentland and Rueter (1994) examine the possibilities and limits of change in the course of continuation of routines; this essentially refers to the adaptation of routines. Feldman (2000) demonstrates the changeability of routines, particularly in response to performance feedback; this essentially refers to the improvement of solutions in the course of routinization. But there are also elements of adaptation, expansion, and problem fixing. Therefore, differences arise less from contradictions between the approaches, but rather from the focus on different aspects of routines.

Linked to this is the urgent appeal to routine research to devote more attention to the topics of rigidity and inertia. This makes the routines concept more relevant and provides an important perspective for exploring obstacles to change from a Schumpeterian perspective.

5.2 Theoretical Implications: Distinguishing Different Types of Routine Change

Against this background, it is necessary and useful to distinguish between different types of routine change. Most obvious are the differences between deliberate routine exchange on the one hand and the other types of routine change on the other. Feldman and colleagues are correct that some routine changes based on feedback and planning go largely smoothly; however, this does not apply to other routine changes, especially deliberate routine exchanges. Routine research can gain a great deal of meaning if it makes precise distinctions here. To name one example:

Dittrich et al. (2016, p. 678) "examine the role of reflective talk in how routines change." They argue that "talk enables routine participants to collectively reflect on the routine and work out new ways of enacting it." So, the focus of this study is on feedback processes within the context of repeating routines. Dittrich et al. distinguish between two forms of reflective talk: (i) reflective talk when adapting a specific performance and (ii) reflective talk when introducing changes to the routine's pattern. This is pretty much what the ostensive-performative approach prescribes, and the topic of "talking about routines" seems to be largely exhausted by the study.

From the perspective of the action-based approach, it becomes evident that the communication regarding routine extends far beyond reflective talk and encompasses a much broader range of topics. Another essential part of this communication arises from the necessity of deliberate routine exchange, which involves breaking truce and confronting resistance. When discussing routine, it is important for management to explore new ways, prepare employees for change, and resolve conflicts. Responsibilities also play a crucial role at this point, such as determining who is responsible for making decisions and leading the conversations. Therefore, decision-making authority and the burden on management become apparent in this context, which significantly affects communication. This aspect is not addressed in Dittrich et al. (2016).

The topic of communication also plays a significant role in the development of routine. Communication here reflects knowledge and deliberate planning. This allows for an examination of the development and increasing use of solutions within the context of repeated actions.

The research has not yet addressed these and other topics because the ostensive-performative approach does not provide a conceptual basis for them, and therefore, the means for investigation are simply lacking. The action-based approach does not question the previous research as much; feedback processes are also a crucial component of routine here. However, the contribution of the action-based approach is to significantly broaden the perspective, providing a conceptual basis for further investigations, such as the acquisition of action-specific knowledge. Indeed, the discourse surrounding "talking about routines" extends far beyond mere reflective dialogue, encompassing a vast and varied array of topics.

Similar thoughts can be made for vicarious group learning (Bresman 2013), intentionality in routines (Dittrich and Seidl 2018), performance feedback (Oehler et al. 2019), and basically all research that is based on the performative-ostensive approach.

In addition to the distinction between deliberate and other types of change, that between routinization, adaptation, and repair is also relevant. Research paints a fairly accurate picture of feedback processes and improvement in the context of routinization, however, the process of applying previous solutions to current problems and thus the transition of action control from system 2 to system 1 has not yet been explored much by the routine research. Of particular interest in this context is the use of scarce management capacities as part of routine control in organizations. How are decision-making competencies distributed, for example when repairing or expanding routines? How is the potential of routines to save management capacities realized for the different types of routine change? Many questions about the specific types of routine changes remain unanswered.

5.3 Practical Implications

The most important practical implication is that routine can once again contribute more to understanding the difficulties of change. Routine research can and should be more than the analysis of feedback processes. Routine is to be understood as a point of reference and innovation as an attempt to overcome the inflexibility and

inertia of the existing routine. With this, the inflexibility of routine becomes an essential element of the understanding of change—not in contrast to, but in addition to, feedback processes. Another practical implication is that distinguishing different types of routine changes helps to deal with routine changes much more consciously and purposefully. That applies to responsibilities, but also to assessing opportunities and difficulties. Routine can be modified, but in very different ways. A clear view makes handling at this point much more aware.

5.4 Limitations

As in any other theory, the simplifications made and structures constructed with the action-based approach limit the scope of this paper. This applies above all to the role of intention in action planning. In fact, this model does not capture actions that are not guided in their formation by some intention, i.e., that are not carried out purposefully. However, it does not eliminate the possibility that such actions exist.

Within the framework of the model, there are other aspects that could be discussed, such as the interplay between intention and performance, and the interaction of different actions, levels of actions, and sub-actions. However, to maintain focus on the main topic of routine change, these aspects were not explored in this paper.

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