

Beyond routines as things: Introduction to the special issue on routine dynamics

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Introduction

Research on routines has grown in recent years as scholars have increasingly recognized the centrality of this organizational phenomenon (Parmigiani and Howard-Grenville, 2011; Salvato and Rerup, 2011). This special issue is devoted to routine dynamics, one branch of research on routines that is based in the idea that routines are practices with internal dynamics that contribute to both stability and change in organizations (Feldman and Pentland, 2003). Ethnographic fieldwork has been an important source of observations from which routine dynamics has emerged.¹ This research has been broadly based in the ideas of practice theory, ethnomethodology, situated action, actor-network theory and sociomateriality. As studies of routine dynamics based in fieldwork have dissolved the illusion of sameness and simple repetition, our usage of the term *routine* has changed. For instance, where we used to say, “that work is routine,” we can now say, “that routine is work.” Fieldwork has helped us see the work required to make a repetitive pattern of action appear “routine.” It has also dissolved the illusion that routines are merely things. While it is still convenient grammatically to use nouns to refer to routines, theoretically we have progressed beyond routines as things.

¹ The studies are too numerous to list here, but Parmigiani and Howard-Grenville 2011 provide an excellent list of the early empirical studies. The articles in the special issue provide updated reviews.

This work has helped us recognize that organizational routines are perhaps more ubiquitous than previously thought and involved in more organizational domains than previously considered. The authors in this special issue, for instance, provide examples that include: handoffs in intensive care, new product development, newspaper printing, industrial photo finishing, retail sales, logistics, regulatory compliance in oil production, development of new technologies in an Artificial Intelligence research lab, and more. Perhaps counter-intuitively, some of these *routines* are not very *routine*. They are, nonetheless, recognizable, repetitive patterns of interdependent action carried out by multiple actors. They are also dynamic in at least two ways. First, these action patterns are temporal; there is no way that the performance of a routine can occur instantaneously or persist indefinitely. Like the flight of a bird, it exists as a trace through time and space. It is a process, not a thing. Second, any action pattern that repeats can potentially change from one performance to the next. Like a folk song, there is always the possibility of a new verse. Within formal organizations, most routines do not seem like bird flights or folk songs. But when we examine them closely, they do not seem like fixed or static things, either. Organizational routines are dynamic because they exist through a process of (re)production, over time and space, through the on-going effort of actants (people and things).

The contributors to this special issue have applied the routine dynamics lens to some fundamental questions about routines and organizing. To introduce their work, we begin by summarizing three core ideas about the routine dynamics lens and how the papers in the special issue take up these key ideas. Then, we highlight four of the major themes addressed in these papers: How do routines interact? How do routines inhibit and promote creativity or novelty? How do routines emerge (and change)? How do routines help organizations maintain both

pattern and variation? Finally, we suggest some implications and directions for future research, because there is always the possibility of another verse.

Routine Dynamics

Routine dynamics is the study of the internal dynamics of routines. The key ideas of routine dynamics have developed over several years, based on contributions by many scholars (Feldman, forthcoming). A core insight from research on routine dynamics is the close connection between routines, practices and process (Howard-Grenville and Rerup, 2016). Indeed, routine dynamics is based in the idea that routines not only connect inputs with outputs but also that, as practices, they emerge through their own enactment and in relation to other practices (Feldman and Orlikowski, 2011).

The foundational theoretical articulation of routine dynamics is arguably the article by Feldman and Pentland published in *Administrative Science Quarterly* in 2003. While studies that identified internal dynamics of routines had appeared before this publication, this article provided an analytic in the form of a recursive cycle of performative aspects (specific performances in specific times and places) and ostensive aspects (enacted patterns) of routines that has been frequently cited in papers discussing routine dynamics. This dynamic produces both stability and change (Feldman and Pentland, 2003) and is consistent with describing routines as (n)ever changing (Birnholtz, Cohen and Hoch, 2007). By recognizing that routines are both stable and changing, routine dynamics implicates organizational stability and change,

Central to routine dynamics is the generative nature of social phenomena. Indeed, in past publications we have referred to routine dynamics as a generative model of routines (Pentland, Feldman, Becker and Liu, 2012), and a performative model of routines (Feldman,

2000, 2003). These terms still apply and point to important aspects of routine dynamics. As studies have proliferated and scholars have added their insights, the term “routine dynamics” has come to stand for the study of the dynamics within and across routines as they are enacted in practice.

While the articulation of performative and ostensive aspects of routines has provided a foundation for studying routine dynamics, it is but one possible analytic for exploring routines as *patterns of action*. In this introduction we take a step back to outline the theoretical underpinnings and implications of routine dynamics. We begin with three core observations intrinsic to the work in routine dynamics:

1. Action in routines is situated;
2. Actors are knowledgeable and often reflective;
3. What appears to be stable (e.g., a routine) is only stable-for-now, at best. Stability is an accomplishment.

These core observations are consistent with insights about the social world from ethnomethodology (Garfinkel, 1967; Heritage, 1984), practice theory (Giddens, 1984; Bourdieu, 1990), and actor-network theory (Latour, 2005) and the empirical and theoretical work done in these fields have informed the empirical and theoretical work of routine dynamics. In the following we show how these basic observations have affected the way we understand routines.

1. Action in routines is situated

Situated action is at least partly ad hoc (Suchman, 1987), embodied (Dourish, 2004; Michel, 2011, 2014) and not necessarily rational (Joas, 1996, Feldman, forthcoming). The idea that routines entail situated action is a deep and important point, crucial for everything that

follows. Without action, there is no routine. Moreover, routines are enacted in specific times and places. That is, they are enacted in and inseparable from the sociomaterial context. The observation that routines entail situated action has epistemological and theoretical implications.

Epistemological Implications. Routine dynamics deliberately puts actions in the foreground and, thus, the unit of observation is situated action. While other traditions that include a focus on specific actions focus on features of the actors' intent, motivation or cognition (cf. Michel, 2014) or focus on tracing associations between *actants* (Latour, 2005), routine dynamics focuses on tracing *actions* and associations between *actions*, emphasizing the way actions constitute social order (Feldman and Orlikowski, 2011; Pentland et al, 2012). This simple move has a variety of implications that lead to a distinctive perspective that identifies the importance of action and the potential creativity of action (Feldman, forthcoming).

Putting action in the foreground does not erase the rest of the picture; there are no actions without actants (Orlikowski and Scott, 2008). Enacting routines entails materiality (D'Adderio, 2008, 2011; Pentland and Feldman, 2005). Actants can take the form of ideas (e.g., pricing models (Zbaracki and Bergen, 2010), objects (e.g., garbage trucks (Turner and Rindova, 2012)) and people or groups of people (e.g., communities (D'Adderio, 2014)). They can be mediators and intermediaries of action, as well as actors in their own right.

While the unit of observation is situated action, the unit of analysis is patterns of action. Studies in routines dynamics analyze patterns of observed situated action. Routines are patterns *of* action. People enacting routines are creating and responding to patterns. These enacted patterns (ostensive aspects of routines) may or may not be articulated by the people enacting them. The patterns most often identified by researchers are related to the tasks being

accomplished for the organization through the routine, such as hiring, budgeting, pricing, planning, quality assurance, etc. (see Parmigiani and Howard-Grenville, 2011 for a list of empirical contexts of studies of routines.)

Conceptualizing routines as patterns of action helps us move beyond routines as things. Routines are repetitive streams of situated action that can be interpreted (or cut) in many different ways by both insiders and outsiders. Focusing on a particular pattern makes it available for analysis; one can consider antecedents and consequences, as well as its internal dynamics. We should recognize, however, that such cuts are selective. For instance, a focus on how a routine enacts efficiency may divert attention away from how the routine enacts creativity. Similarly, a focus on how routines change can be perceived as downplaying the importance of stability; a focus on actions can be seen as downplaying the importance of artifacts or materiality; a focus on the internal dynamics of one routine can be read as downplaying the importance of the dynamics across routines. Several of the articles in the special issue take up the ways in which previous cuts have supported such misinterpretations and move routine dynamics forward by analyzing multiple patterns as well as multiple routines.

Theoretical implications. The emphasis on action and patterns of action has not only epistemological implications, but also theoretical applications. Theoretically, the concepts of relationality and multiplicity are useful for understanding action and patterns of action in routines.

While the word *relationality* may suggest that we are talking about interpersonal relationships, we follow sociological theorists (e.g., Emirbayer, 1997) in using the term to resituate the ontological nature of “things.” Relationality suggests that the nature of any

phenomenon (object, idea, event, action) depends on the connections in which it is embedded. Relationality, thus, contrasts with substantialism, which suggests that the nature of the phenomenon is separable from and knowable independently of other phenomena (Emirbayer 1997).

Analyzing patterns of actions is an explicitly relational idea. By tracing associations among actions, routine dynamics emphasizes relations among actions. Within a routine, actions are related sequentially over time; this can be thought of as the syntagmatic dimension (de Saussure, 1916/1996). The sequence matters, not in the sense that it is always the same, but in the sense that the order in which actions are taken is often meaningful. When ICU physicians engage in the handoff routine, for instance, providing information “out of order” can signal that it is time to have a more extended conversation in order to convey salient or problematic issues (**Lebaron, Christianson, Garrett and Ilan**, this volume). Similarly **Spee, Jarzabkowski and Smets** (this volume) show that the same subroutine may have different meanings and call out different actions when it is enacted in a different part of the overall routine. Sequence is just one feature of the connections that create meaning. **Deken, Carlile, Berends and Lauche** (this volume) show what to some involved in the routine are merely sensible adjustments to others are novel or even highly unusual actions. Understanding the work involved in bringing about change, then, is not simply a matter of charting different perspectives but of respecting that actions, patterns of action and the materiality engaged in actions and patterns of action change as they are enacted (**Sele and Grand** (this volume)).

Multiplicity refers to the many different actual and potential actions as well as the many different actual and potential connectings and embeddings. By definition, the patterns of action

in organizational routines are repetitive. They occur in multiples, and within any set, there is the possibility of variation, innovation, etc. Routines, for instance, entail multiple actions (performative aspect), multiple patterns (ostensive aspect) and multiple human and nonhuman actants. Moreover, for different actants and for the same actant over time routines entail different actions and, potentially, different patterns. A focus on ecologies, clusters or networks of routines as taken by many of the special issue papers multiplies the multiplicities.

2. Actors in routines are knowledgeable and often reflective

Studies based in rich, mostly ethnographic, fieldwork laid the groundwork for routine dynamics by making visible the efforts people make when they enact routines.² These efforts entail the actions of knowledgeable and often reflective people. Two ideas central to routine dynamics emerged from this observation: routines as effortful accomplishments and routines as emergent accomplishments.

Effortful accomplishment. Pentland and Rueter (1994, p. 488) used the phrase “effortful accomplishment” to describe way routines are enacted. Effortful accomplishment refers to the effort it takes to produce the “same” pattern of action. The actual level of effort is an empirical question, and it can vary widely. However, “accomplishment” is almost definitional. This quotation from Giddens’ *Constitution of Society* reinforces this point:

Routine is founded in tradition, custom or habit, but it is a major error to suppose that these phenomena need no explanation, that they are simply repetitive forms of behavior carried out 'mindlessly'. On the contrary, as Goffman (together with ethnomethodology) has helped to demonstrate, the

² See Parmigiani and Howard-Grenville, 2011, for a list of early empirical works in routine dynamics.

routinized character of most social activity is something that has to be 'worked at' continually by those who sustain it in their day-to-day conduct (Giddens, 1984: 86).

From moment to moment, and performance to performance, situated action requires effort. Ironically, doing the same thing can be more difficult than doing something different, Transferring routines, for example, involves effortful enactment and recreation rather than straightforward reproduction or replication, as shown by D'Adderio's (2014) analysis of routines transfer in a computer hardware manufacturer.

The effort involved in enacting routines is evident in many of the studies represented in the special issue. **Bertels, Howard-Grenville and Pek** (this volume), discuss the effort involved in adopting a routine from another organization and how the effort is affected by the culture of the organization adopting the routine. **Danner-Schroeder and Geiger** (this volume) show how patterns that enhance standardization are the result of an effortful enactment that demands performance variety. **Cohendet and Simon** (this volume) depict the process of implementing new routines as "performative struggles" of mobilizing energy and resources.

Emergent accomplishment. Routines are emergent accomplishments in large part because of the effort involved in accomplishing them (Feldman, 2000). Each time a routine is enacted is an occasion for variation, and may also be an occasion for some amount of reflection (**Bucher and Langley**, this volume; **Dittrich, Guérard and Seidl**, this volume). Variations may be retained (or not) for a variety of reasons, which may or may not be conscious or articulated. Retained variations may be easier, more effective, more fun, more familiar, more attractive or

aesthetically pleasing, fit better with other routines, provide more opportunities, fit the interests of people enacting or managing the enactment of the routine.

Not only are routines emergent, but what routines accomplish is emergent. Ironically, because their actions are situated, the participants in a routine may not always be aware of what they are accomplishing or even that they have created a variation. They are knowledgeable about their local context, but routines and what they accomplish are distributed across time and space. Patterns of interdependent action may span many different local situations, giving rise to outcomes that are difficult to anticipate (Rice and Cooper, 2010). For example, **Berente, Lyytenin, Yoo and King** (this issue) show how efforts to implement enterprise-wide controls fostered a wide range of unanticipated local adaptations across the organization they studied. Thus knowledge embedded in routines is never inert nor frozen but activated in situations that give sense to the actions and a chance for potential reconfiguration (Lazaric and Denis, 2005), recombination (Becker, Knudsen and March, 2006), and deviation (D'Adderio 2008).

Emergence is also about possibilities: what could happen? Correlational studies operate on the assumption that we need to understand what is most likely to happen, as predicted by what has happened in the past. For many purposes, such a prediction is useful. In management, however, knowing what is possible is also useful. A key element of the routine dynamics perspective is to identify the possibilities that are inherent in agency, reflection and repetitive accomplishment (effortful or otherwise). While reflection is a general capacity shown to be operative in the studies presented in this special issue, the studies by **Bucher and Langley** (this volume) and by **Dittrich, Guérard and Seidl** (this volume) focus specifically on opportunities for reflection created respectively through reflective spaces and through different ways of talking

about routines. As shown in these papers agency, reflection and repetitive accomplishment create the possibility (not the necessity) of path-making and endogenous change.

3. Routines are stable for now

The interrelation of stability and change is central to routine dynamics. The endogenous relations of performative and ostensive aspects (actions and patterns of action) that underlies the effortful and emergent accomplishments is continuous and can produce relative stability. As noted above, flexibility or change in actions is often the way to accomplish a stable pattern. Indeed, stability has been likened to walking a tightrope - a matter of constant adjustment the result of which is apparent sameness or stability (Tsoukas and Chia, 2002). The tightrope image, however, does not capture all of the relationality of stability and change reflected in routines. The adjustments in routines may reproduce the pattern (effortful accomplishment) or may alter the pattern (emergent accomplishment). Thus, stability in routines is both a matter of perspective and a matter of time. Routines are more likely to appear stable when viewed briefly, from afar. Observation of actions over time, however, reveals the dynamics underlying the stability and the provisional nature of stability.

The simultaneous production of pattern and variety can be a source of confusion in theorizing about routines, as *variation* is easily confused with *change*. As Cohen (2007) pointed out, a routine can show a lot of variety without changing. Indeed, sometimes variation is necessary to produce the same pattern (effortful accomplishment) while at other times variation produces new or different patterns (emergent accomplishment). Thus, several studies feature the connection between variation and change as a central aspect of routine dynamics. How routines are implicated in creativity (e.g., **Sonenshein** (this volume)) or innovation (e.g., **Sele and Grand**

(this volume)) turns on this relationship between variety and change. Moreover, the great strength of engaging in longitudinal studies (e.g., **Aroles and McLean**, (this volume) and **Berente et al** (this volume)) to address the question of how organizations maintain pattern and variety is the ability to see how synchronic processes (variety) are connected to diachronic processes (stability and change).

Themes in the Special Issue Papers

We are excited about the papers in this special issue because they speak to fundamental questions in the science and practice of organizing. These papers offer intensive, multi-method, longitudinal studies of a wide range of settings. By analyzing these settings through the lens of routine dynamics, they offer a novel perspective, and they demonstrate the idea that science progresses when we take a closer look at our core phenomena.

1. How do routines interact?

The basic idea that routines occur in “ecologies” and “bundles” has been recognized for many years (e.g, Nelson and Winter, 1982; Kilduff, 1992; Birnholtz, Cohen and Hoch, 2007). Further, some authors have suggested that routines can form and change through a process of “combinatorics” (Becker et al., 2006). While these metaphors suggest the need to consider diverse collections of interacting routines, fieldwork on organizational routines has tended to focus on one or two routines at a time. As a result, we have studied stability and change in individual routines, but there has been less focus on how routines affect one another and how they work together to support stability and change.

In response to this gap, several of the papers here explicitly consider the interaction of multiple, interdependent routines. These papers begin to identify different ways that routines can intersect, interact, and be interdependent. They also begin to explore the implications of these interactions for stability, change and innovation. For example, **Yi et al** (this volume) use a simulation to show that interactions between routines can generate unanticipated change, and they hypothesize that these changes may contribute to organizational fitness over the long run. Other studies explore the details of these interactions.

Kremser and Schreyögg (this volume), for instance, studied routines in the context of a high volume factory (industrial photo-processing), where the interfaces between routines needed to be carefully planned and controlled at all times. They introduce the concept of “clusters” of routines and argue that clusters of routines form around technological complementarities, which tend to narrow the scope of possible change by creating path-dependent obstacles to new technologies. They show how the technological complementarities of existing clusters make it difficult to incorporate routines based on new technology.

In other contexts, the way clusters or ecologies of routines are enacted affects whether they support relative stability or change. **Sele and Grande** (this volume), for instance, studied a research laboratory for artificial intelligence. They draw on the concept of translation from actor-network theory to show how actants support connections between routines and how these connections can be more or less generative depending on the way they are enacted. The authors show that the same actant engaged differently has a more or less generative effect.

Spee et al (this volume) make a similar observation about the flexibility of routine enactment. They examine intersections between routines in the context of property catastrophe

reinsurance, a financial service where it is crucial to create contracts that balance standardized and customized features. They show that skillful performance affects the orientation of a routine or subroutine to standardization (stability) or to customization (flexibility). They also show that the same routine can be differently oriented as it is enacted in different parts of the focal task.

In other words, the papers here begin to explore relationality among routines, not just within routines. In doing so, they suggest the idea that organizations and capabilities are not just bundles of routines, but may be seen as interdependent networks of routines. By extending their research to include interactions between multiple routines, the authors in this special issue have opened up an exciting new direction for research.

2. How do routines inhibit and promote creativity or novelty?

A second question addressed by several of the papers concerns the role of routines in creativity. Because routines and routineness are sometimes conflated, routines are often considered antithetical to creativity, by definition. This view makes it difficult to explain how designers, architects and others can consistently produce novel work. Scholars of routines have noted that novelty and routine are intermingled through the unreliability of routine replication and routine combinatorics (Nelson and Winter, 1982; Becker et al, 2006). In this view, change is often driven by external forces that mitigate against replication rather than internal (or endogenous) forces stemming from the internal dynamics of enacting the routine. Studies from a routine dynamics perspective have also show that internal or endogenous forces are at play. Through this lens, one can see that merely *enacting* routines creates opportunities for novelty (Zbaracki and Bergen, 2010; Rerup and Feldman, 2011), and the capacity to organize for creativity has

become an important topic (Salvato, 2003, 2009; Grand, forthcoming). The papers here contribute to this question in a variety of ways.

For example, **Cohendet and Simon** (this volume) consider the problem of how to organize to develop video games. **Deken et al** (this volume) discuss a progression of increasingly novel forms of routine work in the context of an automotive supplier attempting to develop a new line of information-based services (e.g., dashboard navigation, etc.). **Sonenshein** examined the routines required to produce “familiar novelty” across a chain of retail stores, where each store is expected to be unique, yet familiar.

In all of these cases, novelty is a competitive requirement. Because they address strategic requirements for firm survival, these papers can be seen as contributing to the connection between routines and capabilities. However, by considering routines in context, they provide additional insights on this vital relationship. For example, **Cohendet and Simon** (this volume) show that by deliberately breaking with their conventional development routine and combining aspects of several routines, UbiSoft was able to create a process that fostered creative, playable games. **Deken et al** (this volume) argue that organizational members will experience new routines as more or less novel and that the experience of novelty requires organizational members to engage in different kinds of routine work. They identify flexing, stretching and inventing as progressively intense routine work, where the same change may require any or all of these kinds of routine work depending on how much novelty the affected organizational members experience. Similarly, **Sonenshein** (this volume) shows that organizations and their members can produce familiar novelty or recognizable creativity by using mechanisms such as personalizing and depersonalizing to take advantage of the relationship of mutual constitution

that exists between creativity and routines.

3. How do routines emerge and change?

The question of how individual routines emerge and change over time remains a central concern for routine dynamics. Several of the papers in this special issue engage this topic. In their study of videogame development **Cohendet and Simon** (this volume) describe a process of forming new routines through intersecting and re-articulating existing routines in response to an organizational failure. In the context of video-game development, they show that the challenge is how to get timely, useful feedback throughout the game development process (as opposed to go/no-go feedback at widely separated stages). To meet this need, game development routines needed to be reinvented and re-organized.

Bertels, Howard-Grenville & Pek (this volume) offer a novel view of how organizational culture shapes the enactment of routines that are new to an organization. They focus on the case of an organization that imported a routine that had been effective in other organizations. Their paper provides a cautionary tale about replication and best practices, and highlights the symbolic dimension of routines, as well as the social influence involved in their enactment.

Several papers consider the role of reflection in creating, changing and maintaining patterns of action. **Aroles and McLean** (this volume) discuss how meetings become the venue for shaping emerging standards by opening up the apparent objectivity in “matters of fact” and translating it into “matters of concern.” The authors show how printers at a newspaper use meetings to question the seemingly objective and reliable nature of standard printing quality parameters by highlighting problems and raising controversies.

Bucher and Langley (this volume) raise a central question about emergent accomplishment: given the mutual constitution of patterns (ostensive aspects) and actions (performative aspects), why is this duality not a continuously reinforcing cycle? How, in other words, is change possible? They point to the critical value of having interacting “spaces” for reflection and experimentation in addressing the challenge of creating a new routine where organizational members are enmeshed in existing understandings and patterns of actions. In their analysis of a new surgical routine, they shed light on the work involved and the potential for managing the work involved in the emergence of a new routine.

Similarly, in their study of shipping routines for live cell samples, **Dittrich et al** (this volume) point to the critical importance of the interaction between collective reflection and action in changing routines. They focus on talk as a special kind of action that supports the development of new routines. For instance, they show how talk among participants provides opportunities for thought experiments as participants work out new routines. Moreover, they help address the issue raised by **Bucher and Langley** (this volume) by showing how talk can bridge stability and change differently in relation to the performative and ostensive aspects of routines.

Danner-Schroeder and Geiger take up the issue from the converse perspective - how do routines maintain some stability as they are enacted in “hot” situations, where emergence is inevitable and routines must be flexible without veering into chaos. They show how training provides different ways of codifying routines (by task and by workflow) so that they can be enacted (and articulated as) stable even as they are enacted flexibly.

Earlier work mentions error or improvisation as a source of change in routines (e.g., Feldman and Pentland, 2003). This conceptualization is consistent with the evolutionary metaphor of random variation and selective retention and is consistent with simulated outcomes described in the **Yi et al** (this volume) paper in this volume. Other special issue papers describe a more mindful, more explicitly social process of critical reflection and experimentation within the team of actors responsible for the routine. On-going, critical reflection is consistent with the blurred boundary between designing and executing and is certainly consistent with the notions of effortful and emergent accomplishment. At the same time, it seems inconsistent with theories of routine formation that are based solely on the psychology or economic incentives of the individual actors. While there has been much concern about identifying the micro-foundations of routines (Lazaric 2011; Felin, Foss, Heimeriks, and Madsen, 2012; Barney and Felin, 2013), the papers in this special issue provide an alternative approach in which context and routines are mutually constituted as they are performed, enacted, reproduced and changed.

4. How do routines help organizations maintain both pattern and variety?

Cohen (2007) noted that routines exhibit pattern-in-variety; variation is a natural part of routine. Of course, organizations exhibit this same quality. Some organizations and some tasks are particularly dependent on simultaneously maintaining both pattern and variation. **Dittrich et al**, (this volume), for instance, note that the start up firm they studied experienced pressures for both consistency and change. The routines they studied had to be enacted in ways that kept these competing pressures in play. Many of the papers in this special issue offer insights into this fundamental property of organizing.

In a study of hand-offs between ICU physicians at their shift change, for example, **Lebaron et al** (this volume) provide an ethnomethodological analysis showing that the strong sequential expectation in the hand-off routine they study becomes a resource for relaying contextually relevant information necessary for accomplishing the daily shift change in ways that allow them to efficiently communicate information about the exceptional as well as the non-exceptional cases. **Aroles and McLean** (this volume) use an ethnographic study of newspaper printing to dig deeply into the concept of difference and repetition (Deleuze, 2004). They show how complex mediations can lie behind the simplest repetitions. Moving beyond the early black-boxed image of routines as entities, they examine the multiple, relational, creative, socio-material processes that underlie the process through which standard routines are repeated into action. In their longitudinal study of enterprise systems at NASA, **Berente et al** (this volume) highlight the mutual constitution of ostensive, performative and material aspects of routines an on-going engine of change. The espoused goals of the enterprise system included standardized work routines and controls, but in practice, standardization was accomplished through local variation. They show that routines operate as “shock absorbers” enabling local variation to minimize the disruption of the centralized imposition of standards.

Future Directions

The papers in this special issue have by no means closed the book on these topics. There appear to be a rich set future directions, some of which we mention here.

1. Networks of Routines

Several of the papers here have examined relationality of routines. They have noted that important organizational outcomes (such as stability, change, and innovation) depend on the connections among routines. Moreover, they have shown that connections can emerge and change through both intended and unintended actions. This suggests that organizational capabilities might be understood as networks of routines, rather than bundles of routines. In short, the idea of relationality implies that we move beyond organizational routines as the unit of analysis and consider relations among routines and networks of routines.

2. Materiality

The papers in the special issue have extended our appreciation for the role of material entanglements in enacting routines (D'Adderio, 2014). While it is often tempting to endow either the action with the ability to determine the nature of the materiality or the materiality with the ability to determine the nature of the action (Orlikowski, 1992), studies based in routine dynamics (both prior to and within the special issue) have provided a basis for exploring the intrinsically material and distributed character of actions of actions or what Scott and Orlikowski refer to as *materializing* (Scott and Orlikowski, 2012, Orlikowski and Scott, 2015). While the inseparability of actions and materiality has become increasingly established, this relationality opens new questions for scholars of organizations as well as for managers. Examining the entanglements of heterogeneous sociomaterial webs as constituents of routines, for instance, will enable us to explore how different sociomaterial assemblages may perform the same routine, as well as how the same sociomaterial assemblages may perform different routines.

3. Embodiment

The relationality of mutual constitution is a core theoretical underpinning of routine dynamics. Many of the studies constituting routine dynamics (both in the special issue and prior to it) have focused on the mutual constitution of stability and change, repetition and innovation or novelty, pattern and variation. Others have explored the relationality of action and materiality. Less explored is the relationality of mind and body. It would be easy to suggest that performances or performative aspects of routines involve bodies while ostensive aspects or patterns involve minds. This would impoverish both concepts and deprive us of an opportunity to explore the embodied nature of acting and patterning (Feldman, forthcoming). Training, for instance, as noted by **Danner-Schroeder and Geiger** (this volume) provides ways for participants in routines not only to recognize patterns cognitively but also to embody them. **LeBaron et al** (this volume) show us that the embodied experience of breaches can trigger explorations of missing information. In these ways, we start to explore the role of embodied familiarity. Practice theorists talk about the “feel for the game” (Bourdieu, 1990; Gherardi, 2006; Nicolini, 2013) and the role of familiarity, attractiveness and repulsion or disgust (Bourdieu, 1984). Exploring the relationality of mind and body in enacting routines would allow us to see both new reasons that is it hard to change the ruts in the road as well as new ways in which the ruts do change.

4. Tracing associations between actions using digitized data

The papers in this special issue have exemplified the use of fieldwork, and we have noted the importance of fieldwork in developing the foundational ideas of routine dynamics. Ethnography has been particularly influential in providing rich, contextualized observations of both actions and patterns. However, with the increased availability of digital trace data, such as workflow

event logs, it is also possible to conduct field research on routines using archival data, rather than observational data (e.g., Pentland, Hærem, and Hillison, 2011). Of course, archival digitized data shows the world from the perspective of a computer system, so it systematically obscures (or highlights) certain information. Ethnographic fieldwork will always be needed to interpret archival results, but digitized trace data provides a way to visualize and compare patterns of action that has not previously been available. Over time, computational methods may provide a fruitful way to extend our understanding of routine dynamics.

Conclusion

If we defined *routines* as things (SOPs, or machines, or genes, or correlations of inputs and outputs), we could not arrive at routines as dynamic patterns of interdependent action. More generally, if you start with an ontology that assumes stability, you can never see change, or the possibilities for change. You can't get here from there. Fortunately, the papers in this special issue did start from a perspective that includes dynamics, emergence and possibility and they have carried that perspective forward. We hope you will join us in seeing where they go.

References

(papers in special issue appear first...)

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