CHAPTER 1

What Is Routine Dynamics?

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1.1 Introduction

Over the last two decades, Routine Dynamics has emerged as an international research community that shares a particular approach to organizational phenomena. At the heart of this approach is an interest in examining the emergence, reproduction, replication, and change of recognizable patterns of actions. In contrast to other research communities interested in those phenomena, Routine Dynamics studies are informed by a distinctive set of theories (e.g., practice theory and related process-informed theories) that directs researchers' attention to particular aspects of these phenomena (e.g., actions), yielding distinctive insights about them (e.g., routines are dynamic).

In this chapter, we offer an introduction to Routine Dynamics as a particular approach to studying organizational phenomena. For this purpose, we provide a brief description of the genealogy of research on routines; starting with the work of the management scholar Fredrick Taylor (1911) and the pragmatist philosopher John Dewey (1922) at the beginning of the last century, to the works of the Carnegie School on standard operating procedures around the middle of the last century, to the economics-based Capabilities approach and the practice-based approach of Routine Dynamics that emerged around the turn of the century. We also discuss the advantages of conceptualizing patterns of action as 'routines', as compared to 'practices', 'processes', 'activities' or 'institutions'. In particular, we highlight that the concept of routines directs the researcher's attention to certain features of action patterns, such as task orientation, sequentiality of actions, recurrence, and familiarity as well as attempts at reflexive regulation. We also introduce and explain the key concepts of the Routine Dynamics perspective and how they have developed over time. This chapter aims to provide the reader with a solid grasp of the Routine Dynamics approach as well with suggestions for further reading to deepen the understanding of particular aspects of this approach.

1.2 A Brief Genealogy of Research on Organizational Routines

To understand Routine Dynamics research, it is important to consider how research on routines has developed historically (see also Felin and Foss, 2009; Mahringer, 2019; Parmigiani and Howard-Grenville, 2011). Situated in a particular historical context, various scholars have developed the concept in response to specific questions at the time. One of the first to explore the role of routines in organizations was Frederick Taylor. Even though he did not use the term 'routine' his book *The Principles of Scientific Management*, published in 1911, laid the foundations for the standardization of work and thus the use of routines as a means for managerial control, supervision, and efficiency. Taylor applied scientific methods to identify the 'best' way to complete a task and encouraged managers to provide instructions and supervision to ensure that workers are using the most efficient way of working. A few years later, Stene (1940: 1129), who was interested in collective coordination in organizations, explicitly referred to routines as 'activities which ha[ve] become habitual because of repetition and which [are] followed regularly without specific directions or detailed supervision'.

In a different line of work, the concept of routines also appeared in the works of the pragmatist John Dewey (1922) (more on pragmatism can be

found in Dionysiou [Chapter 5], this volume). Dewey was primarily interested in learning, both at the individual and collective level, and developed the notion of habit as reflective action. Dewey (1922) distinguished between intelligent habit and dead or mindless habit, highlighting that except for the pathological extreme (the dead routine), routines are lively, infused with emotions, reflection, and morality (Cohen, 2007; Winter, 2013). Even though Dewey and others suggest using the term 'routine' only for the pathological extreme of a dead routine, Routine Dynamics has instead chosen to keep the term 'routine' and show how it is lively, dynamic, and only in rare circumstances dead or mindless.

Between the mid-forties and mid-sixties, a distinctive view, known as the Carnegie School, developed, primarily as an effort to overcome the limitations of classical economic theory that was dominant at the time (see also Rerup and Spencer [Chapter 33], this volume). Simon's (1947) *Administrative Behavior*, March and Simon's (1958) *Organizations*, and Cyert and March's (1963) *Behavioral Theory of the Firm* were all concerned with opening up the black-box of the firm and developing theory on how firms behave as a result of lower-level processes, such as routines (see also Gavetti, Greve, Levinthal, and Ocasio, 2012). Simon (1947) was interested in decision-making of boundedly rational individuals and argued that routines, understood as simple rules, develop to save time and attention. March and Simon (1958) described routines as 'performance programs', that is, a fixed response to a defined stimulus that has been learned over time. Thus, in the case of a routine, search has been eliminated and choice simplified. In Cyert and March (1963), reliable, stable standard operating procedures (SOPs) are important because they allow firms to cope with uncertainty and enable effective decision-making. Overall, being concerned with bounded rationality, the Carnegie School foregrounded the cognitive dimension of routines and their ability to stabilize, and conserve resources (see also Lazaric [Chapter 18], this volume).

Another important milestone in the development of routines research was Nelson and Winter's (1982) *Evolutionary Theory of Economic Change*. The authors drew on evolutionary economics and the framework of variation, selection, and retention to counter traditional neoclassical assumptions of how firms develop and change over time. Defining routines as 'regular and predictable behavior patterns of firms' (Nelson and Winter, 1982: 14), Nelson and Winter defined three roles for routines: (1) Routines as genes: here, routines determine which firms are selected by the environment and thus survive. (2) Routines as organizational memory: organizations store knowledge in routinized activities and thus 'remember by doing' (Nelson and Winter, 1982: 99). (3) Routines as truces: because of the diverging interests of organizational members, routines serve as comprehensive truces that prevent intraorganizational conflict in repetitive activities (see also D'Adderio and Safavi [Chapter 15], this volume). In addition to outlining the role of routines, Nelson and Winter also identified the importance of organizational capabilities, broadly defined as 'the range of things a firm can do at any time' (Nelson and Winter, 1982: 52). Capabilities are seen as bundles of routines that give rise to a firm's competitive advantage (see also Salvato [Chapter 34], this volume).

Subsequently, two strands of research developed almost independently of each other: the Capabilities perspective and the Routine Dynamics perspective (Parmigiani and Howard-Grenville, 2011). The Capabilities perspective, grounded in organizational economics and drawing heavily on the work of Nelson and Winter, was primarily interested in understanding how capabilities as bundles of routines relate to firm performance (Dosi, Faillo, and Marengo, 2008; Dosi, Nelson, and Winter, 2000; Peng, Schroeder, and Shah, 2008). Authors working within this perspective thus 'black-boxed' routines and assumed that individuals execute routines as designed. From this perspective, organizational change was explained by so-called dynamic capabilities, that is, meta-routines that change operating routines (Winter, 2003).

In contrast, the Routine Dynamics perspective developed from an interest in what happens inside the routine. It 'altered the grain size or granularity of analysis and moved the unit of analysis from the firm and the routines that constitute them to the

routine and the actions that constitute them' (Feldman, 2016: 27). It also moved the focus away from formal procedures and cognition to the actions taken by specific people in specific times and places. By drawing on different methods, in particular ethnographic observations, interviews, and archival data (see also Dittrich [Chapter 8], this volume), Routine Dynamics scholars started to challenge received wisdom about routines. For example, Pentland and Rueter (1994) found that there was more variety in performing routines than previous research acknowledged. And Feldman (2000) found that routines were sources of change over time – a finding that challenged the dominant view of routines as sources for stability and inertia.

In search of an alternative understanding of routines, one that accounts for human agency, variety, and change, scholars also started to draw on different theoretical resources. Even though the common saying is that Routine Dynamics is primarily informed by Giddens' (1984) structuration theory, in fact from the outset and in the ensuing years, the field has been influenced by a plethora of theories, a true latticework of ideas. For example, Martha Feldman (in Feldman and Orlikowski, 2011), reflecting on her early studies in Routine Dynamics, describes how she drew on various theories of practice (e.g., Bourdieu, 1977; 1990; Bourdieu and Wacquant, 1992; Giddens, 1976; 1979; 1984; for more see Feldman [Chapter 2], this volume), on phenomenology (Schutz, 1967; 1970), on ethnomethodology (Garfinkel, 1967; see Lopez-Cotarelo [Chapter 4], this volume), and on actor-network theory (ANT) (Latour, 1986, 2005; see Sele [Chapter 6], this volume) to theorize the findings from her fieldwork. All these theories are forms of process theorizing (Tsoukas [Chapter 3], this volume) that have enabled Routine Dynamics to shift towards a more processual focus of how routines are enacted and change over time. Subsequently, Routine Dynamics scholars also drew on pragmatism (Dionysiou [Chapter 5], this volume) and socio-materiality (D'Adderio [Chapter 7], this volume) to theorize the dynamics of routines.

This latticework or 'stew' (Feldman and Orlikowski, 2011: 1244) of ideas is important because the blending and mixing together of ideas produces new ways of thinking about routines. Often, different theories have more in common than we think, but in order to draw on them and combine them in generative ways, one needs to be familiar with them. Many works of Routine Dynamics can be understood in a deeper and more interesting way if understood with these theories in the background. We hope that the chapters contained in the first part of this Handbook provide the theoretical toolkit to better understand Routine Dynamics.

The new way of theorizing routines based on this latticework has shifted the focus from routines as 'entities' in early works to routines as being constituted of parts, that is, the ostensive and performative aspects of routines (Feldman and Pentland, 2003). It has also shifted the emphasis from routines as inherently static to routines as generative and dynamic (Howard-Grenville and Rerup, 2017; Parmigiani and Howard-Grenville, 2011). Theorizing the dynamic aspects of routines has helped to see that stability and change in routines are not opposites but that in fact they are mutually constituted (Farjoun, 2010; Tsoukas and Chia, 2002). This relation is captured in the 'paradox of the (n)ever-changing world' (Birnholtz, Cohen and Hoch, 2007: 316), that is, the assumptions that 'one does not step into the same river twice' and that 'there is no new thing under the sun' can coexist in routines. Routine dynamics has been progressively moving towards 'stronger process theorizing', and further progress has been achieved through the rhetorical shift from ostensive and performative to 'performing' and 'patterning' – or in other words 'the doing involved in the creating of both performative and ostensive aspects' (Feldman 2016: 39).

Overall, the conceptual development in research on routines over the last one hundred years has led to significant changes in the way we use the term 'routine'. In common language, the term 'routine' is primarily used as an adjective to describe the ordinary/mundane and the automatic/mindless and repetitious character of something. In the Carnegie School and evolutionary theory that sees routines as 'fixed things', the adjective and the noun 'routine' were the same thing, i.e., the automatic, mindless execution of a task. With Routine Dynamics, we moved 'beyond routines as things' (Feldman

et al., 2016: 505). While we still use nouns to refer to routines, these nouns are no longer the same as the adjective 'routine' because we see routines as dynamic and generative. With an even stronger processual orientation, we are now moving from the noun to the verb, that is, from 'routines' to 'patterning' and 'performing' (the verb 'routinizing', however, is not what we mean here because 'routinizing' typically refers to managerial efforts to turn patterns of action into formalized, standardized, controllable and stable procedures). These changes in how the term 'routine' is used can be confusing at first, but once clarified this language can become very generative for understanding organizational phenomena. Before we discuss in more depth the key terminology used in Routine Dynamics research, we first turn to why it can be useful to call an empirical phenomenon a 'routine'.

1.3 What Is to Be Gained from Conceptualizing an Empirical Phenomenon as a 'Routine'?

Routine Dynamics scholars are not the only ones to examine recurrent patterns of interdependent actions (Parmigiani and Howard-Grenville, 2011). There are many other research communities who take an interest in action patterns, but they capture them with other concepts. For example, many practice scholars conceptualize action patterns as 'practices', such as when Reckwitz (2002: 249) defines practices as 'a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, "things" and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge'. Similarly Rasche and Chia (2009: 721) highlight that practices 'are first of all an observed patterned consistency of bodily activities; coherent clusters of activities that are condensed through repetition'. In business process management, such activity patterns are referred to as 'processes' (Weske, 2019). Benner and Tushman (2003: 240), for example, define processes as 'collections of activities that, taken together, produce outputs for customers'. Scholars concerned with activity systems conceptualize these action patterns as 'activities', where an activity is defined as 'a discrete economic process within the firm, such as delivering finished products to customers or training employees, that can be configured in a variety of ways' (Porter and Siggelkow, 2008: 34). Many institutional scholars, in turn, conceptualize these patterns as 'institutions'; highlighting that 'there is, and has been, a general understanding that institutions are … patterns of action (behavior)' (Mayhew, 2008: 28) and defining institutions as 'stable, valued, recurring patterns of behavior' (Huntington, 1968: 9).

While it might seem irrelevant whether we *label* such action patterns 'routines', 'practices', 'processes', 'activities', 'institutions' or whatever else, these labels tend to be associated with different theoretical perspectives, which direct the researcher's attention to particular aspects of these patterns and away from others. This begs the question of what can be gained from studying action patterns as routines. This question is particularly acute when it comes to the concepts of routines and practices, as Routine Dynamics is explicitly based on a practice perspective (Feldman and Pentland, 2003).

The relation between the concept of routines and that of practices is somewhat complex, which has something to do with the fact that the concept of practices is defined differently in different practice theories. Most practice theorists, such as Giddens (1984) or Reckwitz (2002), would probably concur that 'while not all practices are routines, all routines are practices' (Feldman [Chapter 2], this volume). For example, the hiring routine can be considered a practice, while the practice of a handshake or gift-giving would not be considered a routine. Thus, from this perspective, routines are conceptualized as a sub-category of practices. Other practice theorists, such as Schatzki (2002), would at least agree that routines are an important element of practices, that is, they are a part of larger practices. In line with both interpretations, the Routine Dynamics perspective can be described as a practice perspective that sensitizes the researcher to certain specificities of particular action patterns; analogously to the way that organization theories tend to sensitize researchers better

to the particularities of organizations than general social theories.

One aspect that characterizes routines as particular practices is the fact that routines are ostensibly directed at the accomplishment of particular tasks – even though routines do not always accomplish these tasks and not everyone involved in these routines necessarily wants the task accomplished. As Feldman (2016: 24) writes, 'organizational routines are enacted in order to do something in and for the organization'. For example, a hiring routine (Feldman, 2000; Rerup and Feldman, 2011) is directed at the task of hiring someone, a pricing routine (Zbaracki and Bergen, 2010) is directed at setting prices, a garbage collection routine (Turner and Rindova, 2012) is directed at the task of collecting garbage, a shipping routine (Dittrich et al., 2016) is directed at shipping something or a roadmapping routine (Howard-Grenville, 2005) is directed at developing and reviewing a roadmap. Because of this task orientation, routines are often associated with organizations or work contexts – i.e., accomplishing some subtasks of the organization. In contrast, some practices might lack a clear focus on specific tasks. For example, the practice of marriage (Whittington, 2007) is not directed at the accomplishment of a particular task; instead, practising the marriage is a purpose in itself. Similarly, the practice of horse betting (Schatzki, 2010) is not oriented at accomplishing a task which could then be measured as having been accomplished well or not. Thus, taking a routine lens directs the researcher's attention to the way that these tasks are accomplished and how orientation to the tasks affects the way the routines are enacted.

A second aspect that characterizes routines as particular practices is the significance of the particular *sequence*s in which actions are performed (see Mahringer and Pentland [Chapter 12], this volume). Some practice theorists such as Schatzki (2002: 2017) stress that the concept of practice does not focus on particular action *sequences*. As he writes, 'he doings and sayings that compose a practice need not be regular' (Schatzki, 2002: 73–74). The regular action sequences described by routines are then just a particular type of practice or even just an element of practices. For example, the practice of medicine can be said to contain many routines, such as particular treatment routines, diagnostic routines (Goh et al., 2011) or handoff routines (LeBaron et al., 2016), but as a whole this practice cannot be described as a regular sequence of actions. Thus, taking a routines lens directs the researcher's attention to the different patterns of action sequences and their variations, which can be described and visualized in the form of narrative networks (see Pentland and Kim [Chapter 13], this volume). In line with the emphasis on sequences of actions and how patterns of actions evolve over time, studies of Routine Dynamics are also process studies (Feldman, 2016; Howard-Grenville and Rerup, 2017).

A third aspect that characterizes routines as particular practices is the recurrent nature of the action pattern which results in some kind of familiarity with the routine. One would typically not speak of an organizational routine if an action pattern was just enacted once in the organization. This familiarity has important implications for the enactment of routines as the participants' earlier experiences with the routine provide them with particular competence and points of reference for the enactment (Birnholtz et al., 2007; Deken et al., 2016; Turner and Fern, 2012). In contrast, some practices, while recurring in wider society, might be enacted just once in the immediate context and thus be entirely novel to all participants. To be sure, this difference is just a matter of degree as all practices presuppose at least some rudimentary familiarity with the practice. Thus, by highlighting this repetitiveness and familiarity, a routine lens directs the researcher's attention to the participants' experiences with earlier enactments of the action pattern and how this affects future routine enactments.

A fourth aspect characterizing routines as particular practices are attempts at their reflective regulation. Because routines are directed at accomplishing particular tasks and tend to be repetitively enacted, we often find explicit attempts at 'managing' the action sequences of which the routines are made. We often find standard operating procedures or if-then statements providing instructions for the way routines are supposed to be enacted (Cyert and March, 1963). Managers and employees often also try to adapt routines (e.g., Salvato,

2009; Salvato and Rerup, 2018), design artifacts to change routines (e.g., Glaser, 2017; Pentland and Feldman, 2008) or switch between routines as a way of influencing the outcomes produced by those routines. In contrast, there are many practices where such attempts at reflective regulation would appear somewhat at odds. Practices such as marriage or dining are just taken for granted and attempts at reflectively regulating these practices would be rather unusual – even though not entirely impossible. Thus, taking a routines lens directs the researcher's attention to the role that explicit attempts at managing or influencing routines through artifacts, such as standard operating procedures or explicit rules, have on the enactment of routines as well as the co-evolution between those artifacts and actual routine performances.

1.4 Key Concepts of Routine Dynamics

In this section we review some of the key concepts used in Routine Dynamics, focusing on their origins and evolution over time. Many of the concepts were imported into Routine Dynamics from neighbouring theories, at times being reproduced faithfully, and at other times being modified or reinvented. We note that the vocabulary has grown substantially over time (we have a garden with old and new flowers) coming to form today an expressive, evolving language. One clear trend has been the progressive move towards a more deeply processual and performative language. This has allowed us to reveal the dynamics of routines and successively unravel the forces within Routine Dynamics. Next, we review some of the most common meanings that people in Routine Dynamics associate with this language.

Despite having identified some distinct trends in the Routine Dynamics vocabulary, we also acknowledge that part of the success behind the topic has been the lightness and flexibility with which we have so far held our terminology. It is true that there are some meanings that have more or less stabilized and gathered substantial consensus, as described in the previous section and in Feldman et al. (2016). At the same time, we are aware that there may be terms that change more rapidly or substantially and terms that extend, challenge or perhaps even replace established terminology. After two decades, the field may be stabilizing but it also remains open, both to retaining established meanings and interpretations and towards developing new vocabularies. In these changes we are guided by our questions and the world we explore.

In the following we discuss several terms that have grown to have specific meanings within Routine Dynamics and concepts that readers not already immersed in Routine Dynamics or related communities (like practice theory or relational sociology) might find confusing. While we describe these concepts here, they are best understood through the many detailed empirical accounts of Routine Dynamics where these concepts come to life. Moreover, there are many other concepts that are important to Routine Dynamics and used in Routine Dynamics studies that we do not discuss here. Temporality is a good example. Though clearly important to our understanding of routines and to the development of Routine Dynamics (see Turner and Rindova [Chapter 19], this volume), the Routine Dynamics community draws on ways of talking about time that one would readily understand without having read other Routine Dynamics studies.

1.4.1 Effortful and Emergent Accomplishments

That routines are both effortful and emergent has become a cornerstone of Routine Dynamics, in contrast with earlier understandings of routines as automatic or executed without explicit deliberation or effort (March and Simon 1958; Nelson and Winter 1982). Citing Giddens (who refers to both Goffman and Garfinkel), Pentland and Reuter note that 'routinized social activity is not mindless or automatic but, rather, an effortful accomplishment' and that '[e]ven some of the most routinized kinds of encounters, such as fast food service (Leidner, 1993) and buying stamps (Ventola, 1987), exhibit a considerable amount of variety and require effort on the part of the participants to accomplish successfully' (1994: 488). Picking up on the notion of

effort, Feldman identified several kinds of effort that people make in the process of repeating routines,

> When actions do not produce the intended outcome, or produce an unintended and undesirable outcome, participants can respond by repairing the routine so that it will produce the intended and desired outcome. The result may be to restore the routine to a stable equilibrium and may not be associated with continued change. When the outcomes enable new opportunities, participants have the option of expanding. They can change the routine to take advantage of the new possibilities. Finally, when outcomes fall short of ideals, they can respond by striving. (Feldman, 2000: 620)

In identifying these types of effort, it also became clear that 'work practices such as organizational routines are not only effortful but also emergent accomplishments. They are often works in progress rather than finished products' (Feldman, 2000: 613). As a result, new patterns of action (change) may emerge through the gradual accretion of actions required to reproduce the same (i.e., stable) pattern of action. While expanding and striving are particularly oriented to change, even repairing may result in the emergence of new ways of accomplishing goals or tasks. Numerous studies in Routine Dynamics show that repetition and replication are not straightforward. Repetition introduces opportunities for changes that overcome minor or temporary obstacles but also introduces opportunities to do the routine differently or better. The result may be more or less effective communication (Bucher and Langley, 2016; LeBaron et al., 2016); better or worse products (Cohendet and Simon, 2016; Deken et al., 2016; Sele and Grand, 2016); or more or less efficient processes (for better or worse) (Aroles and McClean, 2016; Eberhard et al., 2019; Turner and Rindova, 2012).

The distinction between effortful and emergent can be used to orient us to the difference between variance in performance and change in practices and their results. In that case, effortful accomplishments often refer to variations in performance in order to do the same thing or produce stability, whereas emergent accomplishment refers to the effort involved in doing something different or producing change in routines or outcomes (Feldman et al., 2016). But this distinction is also often one that is in the eyes of the beholder. As Deken et al. (2016) showed in their study of three different kinds of 'routine work', what feels like a small change to one person may feel like a lot of change to another person. In practice, effortful and emergent accomplishments are entangled.

1.4.2 Performative and Ostensive Aspects and the Shift to Performing and Patterning

Another important set of concepts is the idea of performative and ostensive aspects. Compared to effortful and emergent accomplishments these concepts are less intuitive. The ostensive/performative distinction was initially introduced to the study of routines as a way of distinguishing an emic and etic orientation,

> Latour uses these terms in describing power, but the concepts apply as well to routines. An ostensive definition of a concept is one that exists in principle (Sevon 1996). It is created through the process of objectification as it is studied. A performative definition is one that is created through practice. 'Society is not the referent of an ostensive definition discovered by social scientists despite the ignorance of their informants. Rather it is performed through everyone's efforts to define it' (Latour 1986, p. 273). (Feldman, 2000: 622)

In this use – as in Latour's use – ostensive and performative are separable and there can be performative routines and ostensive routines. 'Ostensive routines may be devoid of active thinking, but routines enacted by people in organizations inevitably involve a range of actions, behaviors, thinking, and feeling' (Feldman, 2000: 622).

In Feldman and Pentland (2003), these terms were repurposed and integrated more completely with practice theory.

> We adopt language proposed by Latour (1986) in his analysis of power, in which he pointed out that power exists both in principle and in practice. He referred to the former as the ostensive aspect of power and the latter as the performative aspect. We propose that organizational routines also consist of ostensive and performative aspects, which are closely related to the concepts of structure and

> agency, as found in structuration theory (Giddens, 1984). We adopt specialized terminology because, in the domain of organizational routines, structure and agency are mediated by the repetitive collective, interdependent nature of the phenomenon. (Feldman and Pentland, 2003: 100)

The two terms were defined in the following way,

> The ostensive aspect is the ideal or schematic form of a routine. It is the abstract, generalized idea of the routine, or the routine in principle. The performative aspect of the routine consists of specific actions, by specific people, in specific places and times. It is the routine in practice. Both of these aspects are necessary for an organizational routine to exist. (Feldman and Pentland, 2003: 101)

That both aspects are necessary for an organizational routine to exist was an important statement that further moved the field by placing performative and ostensive aspects in a mutually constitutive relation to one another. '[W]e have emphasized that the ostensive and performative aspects of routines are mutually necessary. Without the ostensive aspect, we cannot name or even see our patterns of activity, much less reproduce them. Without the performative, nothing ever happens' (Feldman and Pentland, 2003: 115). Indeed, Feldman and Pentland (2003) connected the ostensive and performative not only to the duality of agency and structure highlighted by Giddens but also to the duality of subjective and objective emphasized in Bourdieu's work,

> The ostensive aspect of a routine enables us to create an apparently objective reality through the subjective acts of guiding, accounting, and referring. As practiced objective and subjective dimensions are mutually constitutive (Bourdieu, 1990). Objective and subjective aspects are inseparable because the objectified summaries of routines (the artifacts) are constructed from our subjective perceptions of them. Thus, ironically, routines exist as objects because of our subjective understandings of them. In a sense, our subjective understanding and interpretation is the glue that binds the actions into the patterns we recognize as the routine. (Feldman and Pentland, 2003: 109)

The emphasis in Routine Dynamics on both performative and ostensive aspects constitutes departures from previous ways of thinking about routines. First, an insistence on the performative aspect – on identifying specific actions in specific times and places – is a discipline that marks the empirical work in Routine Dynamics. Rather than describing dynamics in abstract terms, this discipline goes to the root of the organizational dynamics and enables scholars to see what others have missed. This discipline is very much influenced by the focus in actor-network theory on tracing actions and actants.

Second, as Feldman (2016: 27) writes, 'the introduction of the term "ostensive" drew attention to the relationality of performances and patterns and the constitutive nature of action in patterns. Similar to Wittgenstein's use of the term (2001), ostensive implies that patterns are constituted of specific instances that can be pointed to as a referent.' Take, for instance, the example of the pattern that makes up our everyday experience of a colour. 'While there is a scientific definition of blue (for example, a range of light wavelengths), on an everyday basis we know the color blue through the various blues (or objects coloured blue) that exemplify blue. In other words, there are things we can point to that make up the pattern that we recognize as blue' (Feldman, 2015: 321). Routine Dynamics makes a similar argument about performances and their associated patterns. Ostensive aspects of routines are always made up of performances that we can point to.

Latour has argued that the problem with ostensive definitions is that they become imbued with independence and mistaken as a cause of action – people mistake 'what is glued for the glue' (Latour, 1986: 276). The way Routine Dynamics has used the ostensive aspect militates against this mistake. While the ostensive aspect refers to the abstract patterns of routines, it is relationally entangled with performance. This allows Routine Dynamics to acknowledge the importance of abstract patterns without giving them priority over the actions that are integral to them. The notion of ostensive aspects that are enacted patterns, produced through action, moves Routine Dynamics away from a focus on patterns that are envisioned, intended or mandated.

As empirical work in Routine Dynamics gave meaning to the performative and ostensive aspects of routines by identifying the specific actions taken by specific people at specific times and places and

the enacted patterns that emerged as a result of these specific actions, the processual ontology of routines also developed. For instance, in 2014, D'Adderio identified the effortful (Pentland and Rueter, 1994) and emergent (Feldman, 2000) '"patterning work" that is involved in the constantly challenged and never fully achieved (Tsoukas and Chia, 2002) pursuit of balance between competing goals' (1346). Danner-Schröder and Geiger (2016) draw on this idea of patterning work to 'understand the mechanisms that routine participants enact to create and recreate patterns, which they recognize as stable or changing' (656). Goh and Pentland (2019) 'conceptualize patterning as the formation of new paths and the dissolution of old paths in a narrative network (Pentland and Feldman, 2007) that describes a routine, (1901). There are different ways in which these patterns are created. For example, Turner and Rindova (2018) describe how time organizes patterning.

Feldman (2016) suggested performing and patterning as alternatives to the performative and ostensive aspects as a way to make action more focal in our study of routines, and particularly to emphasize the active nature of creating patterns. Routine Dynamics now offers both a weaker process ontology, based on the idea that routines consist of performative and ostensive aspects, and a stronger process ontology, based on the idea that routines are enacted through performing and patterning. The difference between the strong and weak process ontology has been defined by process theorists as 'different ontologies of the social world: one a world made of things in which processes represent change in things (grounded in a substantive metaphysics) and the other a world of processes, in which things are reifications of processes (Tsoukas and Chia, 2002) (grounded in process metaphysics)' (Langley et al., 2013: 4). Thus, 'according to a weak view, processes form part of the world under consideration, according to a strong view the world is process' (Hernes, 2008: 23).

1.4.3 Situated Action

The idea of situated action originated in anthropology/information systems (Suchman 2007; Lave, 1988) and acquired meaning in Suchman's distinction between 'plans' and 'situated action'.

> That term underscores the view that every course of action depends in essential ways on its material and social circumstances. Rather than attempt to abstract action away from its circumstances and represent it as a rational plan, the approach is to study how people use their circumstances to achieve intelligent action. Rather than build a theory of action out of a theory of plans, the aim is to investigate how people produce and find evidence for plans in the course of situated action. More generally, rather than subsume the details of action under the study of plans, plans are subsumed by the larger problem of situated action. (Suchman, 2007: 70)

One of the ways that the situated nature of action has informed Routine Dynamics is through the idea that practical consciousness (Giddens, 1984) or practical sense (Bourdieu, 1990; Boudieu and Wacquant, 1992) is important to how people enact routines because the actions required are too varied for rules to be able to determine action (Feldman and Pentland, 2003; Pentland and Feldman, 2005; Pentland and Reuter, 1994; Reynaud 2005). Suchman's (1983) study of filing in triplicate provided an early example of how an apparently simple routine with a sequence of seven clearly defined steps quickly becomes complicated when enacted in the real world. The routine participants have to draw on their practical sense to ensure that, in the end, it will look as if the sequence had been followed. The situated nature of action is thus twofold: actions are situated in specific material and social circumstances and they are situated in patterns (here, the pattern of filing in triplicate).

The development of a hiring routine in a Danish research lab provides a more complex example of situated action. The university that was the bureaucratic home for the research lab articulated rules for hiring, but the lab directors took action (based on their practical sense) to work around the rules so that they would be able to hire the kind of people they needed to realize the goals of the lab. As a result, actions taken in the hiring routine were situated in two different patterns: hiring in a university bureaucracy and hiring for a research lab. Although research on boundary objects has shown

that it is possible to have action that is situated in different contexts and has different meanings in each of these contexts (Carlile, 2002; Star and Griesemer, 1989), in this particular case the effort to produce actions that were acceptable in both contexts ultimately provoked change in how the lab directors envisioned the work of the lab (Rerup and Feldman, 2011).

When Routine Dynamics scholars studied the situated nature of actions, they also noticed how the patterns of routines are themselves situated in a context. Howard-Grenville (2005) theorized the situatedness of routines as 'embeddedness' in a variety of structures (e.g., technology, coordination and culture). Embeddedness originally assumed that the context is separable from, though important to, the routine. An alternative way of theorizing the relation between situation and routine is to see them as inseparable and entangled. In this view, routines are 'enacted through' their situated socio-material context (D'Adderio 2014; Feldman et al., 2016; see also D'Adderio [Chapter 7], this volume). The latter definition highlights the constant entanglement and mutual shaping of routines and their context (see also Howard-Grenville and Lodge [Chapter 16], this volume).

1.4.4 Artifacts and Materiality

In reaction to a long-standing and persistent confusion in the study of routines that identified routines with artifacts, i.e., the written procedures or standard operating procedures (SOPs) describing routines, Pentland and Feldman initially described artifacts as important but exogenous to the generative system (Pentland and Feldman, 2005). This move allowed the focus to shift to actions and patterns (performative and ostensive aspects of routines). It, unfortunately, also gave some the impression that actions could be enacted and patterns could emerge without artifacts. This impression was rectified through later work. D'Adderio (2011) moved artifacts into the generative system, where they have remained. D'Adderio and other scholars have continued to develop our understanding of the centrality of artifacts, and materiality in general, through numerous empirical studies (Aroles and McLean, 2016; Boe-Lillegraven, 2019; Cohendet and Simon, 2016; D'Adderio, 2014; D'Adderio and Pollock, 2020; Glaser, 2017; Kiwan and Lazaric, 2019; Sele and Grand, 2016).

This work shows how, for instance, routines 'change dynamically as they are enacted through specific configurations of artifacts and communities which shape ostensive and action patterns leading to varying outcomes (i.e., alignment or improvement, replication or innovation)' (D'Adderio, 2014: 1347). The heterogeneous configurations shaping routines are referred to as socio-technical *agencements* (Callon, 1998; D'Adderio, 2008) or socio-material assemblages (D'Adderio, 2008; Orlikowski and Scott, 2008; Suchman, 2007). These are agentic arrangements which include a plethora of socio-material features (texts, bodies, objects, values, etc.) whose properties are always emergent. Assemblages are 'arrangements endowed with the capacity to act in different ways, depending on their configuration' (Callon and Çalışkan, 2010: 9), and different assemblage configurations bear different effects over routines. Thus for an SOP or rule to have an effect on performances, it has to generate an assemblage (including actors' intentions, emotions and actions, digital and physical artifacts, etc.), which together supports the assumptions, views and goals embedded in the SOP at design and/or usage stage. This suggests that the effect of a rule or SOP can only theoretically be 'fully descriptive (a passive, fixed representation of the actual [routine]) or fully prescriptive (univocally ordering and structuring the [routine], mostly they are performed' (D'Adderio, 2008: 786), meaning that they configure routines to various extents (e.g., weak vs. strong performativity). The notion of assemblage helps us move beyond the unhelpful ontological separation between actors and artifacts, physical and material, objects and subjects, solid and fluid, while also helping us theorize how emergent, heterogeneous socio-material configurations shape routines as they are performed within and across organizational locations, and over time (Blanche and Cohendet, 2019; D'Adderio, 2014; D'Adderio and Pollock, 2020).

This novel approach afforded by combining Routine Dynamics with ANT/STS (Science-and-Technology Studies)/Performativity Theory-related