A Design Perspective on Routine Dynamics:
The Carnegie School’s Legacy for Routine Studies

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Abstract

The purpose of this research is to study the theoretical and methodological problems of changes in organizational routines. Previous research normally centers on the exogenous changes that accompany changes in the environment, but the focus has moved to the endogenous changes not premised on organizational adaptation. However, in both debates, areas remain that still require theoretical analysis. This research revisits the arguments of the Carnegie School, which prompted research on organizational routines, and focuses on their implications that previous research have been overlooked to study the theoretical and methodological problems of both discussions.

Exogenous Change in Organizational Routines

Although organizational routines are now defined to be recurrent behavior patterns, rules or procedures (Becker, 2004), narratives or linguistic representations (Pentland & Feldman, 2007), dispositions (Becker, 2008; Hodgson, 2003; Hodgson & Knudsen, 2004), and generative systems (Pentland & Feldman, 2008), the concept initially signified the rules used by organizational members for decision-making; “decision premises” or “decision rules” would have been more appropriate. The inaugurators of routine studies, scholars of the Carnegie School, understood organizational routines to be rules used by humans limited by bounded rationality to simplify the search process related to decision-making, notwithstanding the differences in terminology they used, for example, “habit” (Simon, 1997),
“performance programs” (March & Simon, 1958), and “standard operating procedures” (SOPs; Cyert & March, 1963).

Organizational routines are rules used as premises in decision-making by organizational members. But if the results of rule-based behaviors do not meet expectations, they may be modified. To explain changes in routines, previous research has typically assumed a hierarchical structure, in which high-level (higher-order) routines change low-level (lower-order) ones.

For example, March and Simon (1958) understood performance programs as a three-level structure in which the “regulations and procedures” were the lowest programs for performing a task, the “switching rules that determine when it will apply one program, and when another” were the mid-level programs, and the highest level were the “procedures it uses for developing, elaborating, instituting, and revising programs” (p. 170). Cyert and March (1963) understood a two-level SOP structure of high-level (higher order) “general choice procedures” concerning decisions-making at the company level and low-level (lower order) “specific standard operating procedures” concerning daily operation level decision-making (pp. 101-104). They thought that, if routine-based behaviors did not yield results meeting satisfactory standards, the company could modify the low-level routines following the high-level routines, or reconsider the high-level routines themselves.

Carrying on the intellectual tradition of the Carnegie School, Nelson and Winter (1982) explained routine change using similar logic, but they paid special attention to the search routines modifying high-level routines (pp. 17-18). When modifying existing routines, the company searches for other routines. If a substitute routine is found, the company creates a new routine, either by imitating the newfound routine or by making a new combination with the existing routine. In other words, change in high-level organizational routines is brought about by even higher-level search routines.
Studies about dynamic capabilities have tried to comprehensively explain an organization’s ability to change its routines, including search routines. Dynamic capabilities are defined as an organization’s “ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece, Pisano, & Shuen, 1997, p. 516), or to the “learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines” (Zollo & Winter, 2002, p. 340). They can be thought of as high-order routines encouraging environmentally adaptive changes in existing routines.

Thus, although previous research has invariably assumed the existence of “meta-routines (routines for changing routines)” (Pentland, Feldman, Becker, & Liu, 2012, p. 1501), one question arises in this regard: even if change in low-level routines could be explained by high-level meta-routines, how could change in meta-routines be explained? Logically, as meta-routines can bind unsuitable knowledge into decision-processes (Leonard-Barton, 1992), there is a need to explain how meta-data routines are changed. Of course, one can always hypothesize routines of a yet higher level. However, change in those routines would also be questioned, and an even higher concept would be needed. In other words, any attempt to explain change in organizational routines through the premise of a hierarchy of routines necessarily leads to an “infinite regress” (Hans, 1985), rendering the problem logically insolvable.

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#### Organizational Routines as Institutions

The cause of this theoretical pitfall follows from the naïve assumption that decision rules determine people’s behavior. Actually, Becker (2004) indicated that research that defines organizational routines as behavior patterns has become
the mainstream, because so much of it similarly assumes that rule content is directly reflected in people’s behavior (p. 664). Gersick and Hackman (1990) placed the Carnegie School’s conceptualization of organizational routines as behavior patterns at the origin of routine studies (pp. 68–69), Pentland and Rueter (1994) placed March and Simon (1958) and Nelson and Winter (1982) at the origin, with their representative research on organizational routines using a stimulus-response model. Furthermore, research on the problem of organizational rigidity stemming from routines (e.g., Hannan & Freeman, 1984; Whetten, 1987) confirms that this naïve assumption is pervasive.

However, this understanding of the relationship between rules and behavior misses the real intention of the Carnegie School. As their account of that relationship can appear based on a stimulus-response model (e.g., Simon, 1997, pp. 99–100; March & Simon, 1958, pp. 139–140; Cyert & March, 1963, pp. 33–34), some have criticized the Carnegie School’s concept of organizational routines (e.g., Cohen, 2009). However, scholars of the Carnegie School pointed out that the relationship between rules and behavior is not straightforward.

In fact, March and Simon (1958) asserted that their term “performance programs” did not imply complete rigidity (p. 142), and Gavetti, Levinthal, and Ocasio (2007) have also pointed out that Nelson and Winter (1982) did not adequately grasp the implication that actions guided by performance programs are flexible (p. 526; p. 534). Furthermore, Cyert and March (1992) have, interestingly, changed their view regarding the relationship between rules and behavior. In contrast to the first edition of *A Behavioral Theory of the Firm* (1963), in which they had explained that rules govern people’s behavior, they emphasized in the epilogue added to the book’s second edition (1992) that rules have a normative influence on the orientation of people’s behavior: rather than being used to determine behavior, rules are used strategically when selecting among
actions suitable to the situation at the time (pp. 230–232). Thus, the correct understanding of the Carnegie School’s concept of decision rules is that they are premises people reference when making decisions, which can result in a variety of actions at the behavior level.

It should be noted that James G. March, who created both the conceptual model for organizational routines and the original misunderstanding of it, brought attention to the concept’s implications and defined this concept as “institutions” (March & Olsen, 1984, 1989, 2006). The term “institutions” means a system of abstract norms to which people refer before acting. In other words, notwithstanding that organizational routines provide goals and templates for behavior, because they do not instruct specific actions and therefore individual judgment and interpretation has to be introduced in order to perform the task, variation in people’s practices is possible.

Similarly, Feldman (2000, 2003) and Feldman and Pentland (2003) formulated the notion of organizational routines as dualities, differentiating between the norms referred to at the time of acting and the practice as its result. Distinguishing between a routine’s ostensive aspects (the abstract understanding of the work and how it should be done) and its performative aspects (the actions taken at a specific time and place), Feldman and Pentland argued that understanding the performative aspects was more important for routine studies.

**Endogenous Change in Organizational Routines**

After attention was directed to the performativity of an organizational routine, some studies have emphasized that change from performative to ostensive aspects of routines is endogenous to routines. For example, Becker, Knudsen and March (2006) and March and Olsen (2006) describe how incremental change in the routine occurs through a continuous process in which actors created new practices of

These arguments, in avoiding the problem of infinite regress that hobble traditional arguments, provide a new explanatory framework for change in organizational routines. However, it remains to be explained why variation in actor practices should lead to change in the routine. These researchers seem to be arguing that an increase in practice variation automatically leads to changes in routine.

On the other hand, Feldman and Pentland (2003) and Pentland et al. (2012) explain routine dynamics using an evolutionary theory model. Here, the ostensive aspects of a routine changes as variation in its practice are selectively preserved. According to these researchers, to change a routine (its ostensive aspects), managers or administrators must legitimize specific actions because they have been given the role of selecting the specific actions and approving the actions for integration into the routine (Feldman & Pentland, 2003, pp. 108-114; Pentland et al., 2012, pp. 1501-1503).

Those researchers have refined the discussion by establishing a mediator—control practices—between changes in the performative and ostensive aspects of a routine. However, theoretically and practically reasons to explain routine (its ostensive aspects) change remains to be demonstrated. This agenda for research is the other side of the coin of the naive assumption shared in traditional routine studies that decision rules determine people’s behavior. Though the original theoretical premise that routines have the performative aspects is confirmed, if this agenda is being tackled, the reasons for arguing on change in the ostensive aspects of routines need to be clarified. Similarly, although previous research may have shown that managers or administrators change routines, it has not discovered why they make those changes; thus, the conventional research agenda is still blindly being followed.
The Carnegie School Revisited (2)
Design of Organizational Routines

Regarding this problem, it may be necessary to return to Herbert A. Simon’s arguments that founded routine studies. According to Simon, because humans are limited by their bounded rationality, they cannot optimize their decisions on what to do to achieve organization’s goals. Because of this limitation, to align their decision-making with the goals of the organization, it is necessary to limit the range of alternatives by simplifying the psychological environment for individual decision-making (Perrow, 1972; Simon, 1991, 1997). Specifically, Simon thought that, as one factor making up the psychological environment, organizational routines, the encoding of an organization’s past experiences, act as a management tool for controlling individual behavior by limiting alternatives to those that contribute to the attainment of the organization’s goals.

In the same way, Schulz (2008) pointed out that organizational routines have the inherent functions, as discipline, of rationalizing individuals’ behavior and making legitimate domination possible. Therefore, a difference should be made, epistemologically, between “routines” and the “routinization of behavior,” since whether people’s behaviors will conform to a routine depends on whether it has disciplinary effects.

This point concerns the methodological implications for routine studies. Thus far, description has been the core of routine studies. Researchers made efforts to observe a phenomenon in detail and to describe it exactly, taking a scientific view that should be referred to as descriptive theory. However, if one is interested in organizational routines’ control functions and how they organize individual behaviors in ways congruent with the organization’s goals, a different methodological approach to routine studies may be more appropriate. In particular, it may be that routine
studies should include, as part of their output, the development of satisficing heuristics for management regarding how to design a routine’s ostensive aspects. To that end, an orientation toward adding pragmatic value—that is, to help practitioners make better decisions—would be needed, based on prescriptive theory (Bell, Raiffa, & Tversky, 1988; Argyris, 2003).

As a matter of fact, in *The Sciences of the Artificial* (1996), Simon tried to argue for prescriptive theory. While asserting the need to describe, following the natural sciences, how the artifacts made by humans with bounded rationality function, he also conceptualized how science should utilize the knowledge gained from those descriptions to actively engage in artifact design. His book did not examine the concept exhaustively, but it is worth noting that his seminal idea is being developed as a new scientific method called “design science” (Lee, 2007; Jelinek, Romme, & Boland, 2008; March & Storey, 2008). In contrast to traditional science, which attempts to describe phenomena uniquely from an objective viewpoint, design science is oriented toward intervention and prescribes effective designs for artifacts (Lee, 2007, p. 49).

When discussing the design of organizational routines, it is necessary to pay attention to the objects of the design. Just as there are cases where an organizational routine is codified, for example, in a manual, there are also cases where it exists as customary practices or other mindsets adhered to by members of the organization. In the latter case in particular, instead of being directly designed by managers or administrators, it can only be designed indirectly through artificial objects such as manuals.

Additionally, regardless of how detailed the design of a routine may be, the practices at jobsites cannot be completely controlled. Realistically speaking, just as it is impossible for managers or administrators to predict every action, unexpected variations will occur. Therefore, because a design’s results will always be
incomplete, it needs to be approached with the understanding that design is an ongoing process (Garud, Jain, & Tuertscher, 2008).

However, this doesn’t mean simply making the instructions in routines more clear. Realistically, it is impossible to imagine in advance every possible scenario and create of list of what to do in every situation. To achieve its goals, organization might require a wide variety of actions by its members, and some cases are better served when the relevant organizational routines are ambiguous (Blau, 1963, p. 23). In any event, one needs to evaluate how a routine’s degree of abstraction relates to the relevant performative practice, while also taking into consideration the organization’s goals and the worker’s situation.

**Conclusion**

In this study, I explored the theoretical and methodological issues of change in organizational routines. Organizational routines should be understood as the normative decision rules referenced at the time of acting; and results in a variety of actions at the behavior level. However, research that examines only the performative aspects of routines is also insufficient. Because organizational routines is fundamentally a means of controlling the practices of organizational members, understanding change in organizational routines requires a discussion of how managers or administrators design (and redesign) a routine’s ostensive aspects taking into account actual jobsite performative practices.

By taking these implication into account, our research practices will take a completely different approach from the conventional. Taking a prescriptive approach make it possible to develop research practices that can contribute to improving the design of organizational routines. To do so, however, will require further study of possible design variations.
Acknowledgments

I am grateful to Kotaro Kuwada, Noboru Matsushima, Misanori Takahashi for their helpful comments in developing this paper. This work was supported by the 2016 Special Research Grant from Matsuyama University.

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