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Hertfordshire

AL10 9AB

United Kingdom

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Geoffrey M. Hodgson

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The Business School, University of Hertfordshire, De Havilland, Hatfield, Hertfordshire AL10 9AB, UK
http://www.herts.ac.uk/business http://www.geoffrey-hodgson.ws

Address for correspondence:
Malting House, 1 Burton End, West Wickham, Cambridgeshire CB1 6SD, UK
g.m.hodgson@herts.ac.uk

The Concept of a Routine

Geoffrey M. Hodgson

The significance of routines in modern, learning, innovating economies is widely appreciated.[1] Routines are vital to all organizations. Hence it is important to understand both how they can be built and how they can be changed. Such an appreciation is important, for analyzing how the business world works, for understanding how knowledge is retained and transferred, for the development of business strategy, and for the creation of policies to encourage more beneficial business practices.

Detailed empirical investigation is essential in this regard, but detailed taxonomic studies based on empirical evidence are relatively rare. One reason why empirical investigations have so far remained rather limited is that the conceptual specification of a routine remains hazy. Greater conceptual precision is a vital precondition of fruitful empirical enquiry.

The aim of this essay is help refine and define the concept of the routine, by citing relevant insights from philosophy, social theory and psychology, and by focusing on some milestone contributions in this area. The paper is divided into four sections. The first section addresses the analogous and component concept of habit, with a view to making a distinction between habits and routines. The second section explores the metaphor of 'routines as genes' and argues that routines must be treated as capacities or dispositions, rather than behaviours. The third section considers the mechanics of routine persistence and replication in more detail, by briefly discussing some important theoretical and empirical studies in the area. The fourth section concludes the essay.

1. Habits as the Basis and Individual Analogue of Routines

For two reasons, to understand the concept of a routine we need to appreciate the idea of a habit. First, routines operate through the triggering of individual habits. Second, routines are the organizational analogue of individual habits. So the analysis starts here with the habit concept.

Like 'routine', the word 'habit' exists in common parlance and is taken to mean a variety of things. Both words need to be defined more precisely for scientific usage. Even in scientific circles, and especially since the rise of behaviourist psychology after the First World War, there has been some ambiguity in the definition of habit. The concept of habit was central to the pragmatist philosophy and institutional economics of the early twentieth century. It is useful to return to the meaning of the term employed then, especially as this earlier usage is now enjoying a revival.

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[1] Thanks are due to Markus Becker for useful comments on an earlier version of this essay.

Pragmatist philosophers and institutional economists such as Thorstein Veblen (1919) regarded habit as an acquired proclivity or capacity, which may or may not be actually expressed in current behaviour (Hodgson, 2004). Repeated behaviour is important in establishing a habit. But habit and behaviour are not the same. If we acquire a habit we do not necessarily use it all the time. It is a propensity to behave in a particular way in a particular class of situations.

The pragmatist philosopher and psychologist William James (1892, p. 143) proclaimed: 'Habit is thus the enormous fly-wheel of society, its most precious conservative agent.' Similarly, the pragmatist sociologists William Thomas and Florian Znaniecki (1920, p. 1851) criticized 'the indistinct use of the term "habit" to indicate any uniformities of behavior. … A habit … is the tendency to repeat the same act in similar material conditions.' Also treating habit as a propensity, William McDougall (1908, p. 37) wrote of 'acquired habits of thought and action' as 'springs of action' and saw 'habit as a source of impulse or motive power'. Elsewhere, in his defences against the behaviourist invasion in psychology, McDougall (1924) explicitly emphasized the conceptual difference between dispositions and behaviour. As the pragmatist philosopher and psychologist John Dewey (1922, p. 42) put it: 'The essence of habit is an acquired predisposition to *ways* or modes of response.' The use of habit is largely unconscious. Habits are submerged repertoires of potential behaviour; they can be triggered or reinforced by an appropriate stimulus or context.[2]

As the pragmatist philosopher Charles Sanders Peirce (1878, p. 294) declared, the 'essence of belief is the establishment of habit'. Accordingly, habit is not the negation of deliberation, but its necessary foundation. Reasons and beliefs are often the rationalizations of deep-seated feelings and emotions that spring from habits that are laid down by repeated behaviours. This interplay of behaviour, habit, emotion and rationalization helps to explain the normative power of custom in human society. Hence 'custom reconciles us to everything' – as Edmund Burke wrote – and customary rules can acquire the force of moral authority. In turn, these moral norms help to further reinforce the institution in question.

Habits are socially acquired, not genetically transmitted. By accepting the foundational role of habit in sustaining rule-following behaviour, we can begin to build an alternative ontology of institutions and routines, in which we avoid the conceptual problems of an account based primarily on intentionality. This is not to the deny the importance of intentionality, but to regard it as a consequence as much as a cause, and to place it in the broader context of other, non-deliberative behaviours.

Importantly, all learning, and the attainment of all skills, depends on the acquisition of habits. Knowledge and skills involve the capacity to address a complex problem and to identify rapidly the means of dealing with it. Experience and intuition are crucial here, and these must be grounded in acquired habits of thought or behaviour that dispose the agent to identify the crucial aspects of or responses to the problem. All skills, from knowledge of mathematics through competence with languages to ability with a musical instrument, depend on habits. Habits are the necessary means of avoiding full reflection over every detail, so that the more deliberative levels of the

[2] The conception of a habit as a propensity or disposition is also found in modern works such as Camic (1986), Margolis (1994), Murphy (1994), Kilpinen (2000) and others.

mind are freed up for more strategic issues. If all details were necessarily the subject of conscious deliberation, then the mind would be overwhelmed and paralyzed by minutiae.

We may briefly consider two possible types of mechanism by which habit may be replicated from person to person.[3] The first is by incentive or constraint. These can provide reasons to acquire specific customs, follow particular traffic conventions and use specific linguistic terms. In these cases, because others are acting in a particular way we can have powerful incentives to behave accordingly. In doing so, we too build up habits associated with these behaviours. The behaviours are reproduced and also the habits giving rise to them are replicated.

Another possible mechanism is imitation. Imitation need not be fully conscious, and it will also involve some 'tacit learning' (Polanyi, 1967; Reber, 1993; Knudsen, 2002). Perhaps imitation can occur even without strong incentives, on the grounds that the propensity to imitate is instinctive, and this instinct has itself evolved for efficacious reasons among social creatures (James, 1892; Veblen, 1899; Campbell, 1975; Boyd and Richerson, 1985; Simon, 1990; Tomasello, 2000). However, an imitation instinct would require an existing set of common behaviours in the group, otherwise an emerging propensity to imitate might not have a selection advantage. For instinctive imitation to take off, common behaviours may have to emerge for other reasons. Furthermore, if imitation is more than mimicry, then the rules and understandings associated with it also have to be transmitted. Imitation is more problematic than it appears. Nevertheless, there are provisional grounds to consider a partially instinctive propensity to imitate as a strong element in the complex social glue, and hence a force behind the replication of habits.

Having established the concept of habit, and for reasons that should become clearer below, we are now in a stronger position to turn to the concept of a routine. In the following section it will be explained how routines play a similar role for organizations that habits play for individuals.

2. Routines as Organizational Genes

In everyday parlance the word 'routine' is used loosely to refer to repeated sequences of behaviour, by individuals as well as by organizations. However, when Richard Nelson and Sidney Winter (1982) used the concept in their seminal work on economic and organizational evolution, and repeated the metaphor of 'routines as genes', they suggested a more specific and technical meaning for the term. It is important to clarify and refine this technical meaning.

A consensus has now emerged that routines relate to groups or organizations, whereas habits relate to individuals (Cohen *et al*., 1996; Dosi *et al.*, 2000). Individuals have habits; groups have routines. Routines are the organizational analogue of habits. But routines do not simply refer to habits that are shared by many individuals in an organization or group. Routines are not themselves habits: they are organizational meta-habits, existing on a substrate of habituated individuals in a social structure. Routines are one ontological layer above habits themselves.

[3] See the more extensive discussion in Hodgson and Knudsen (unpublished a).

Having established the analogy between habits and routines, in the next section the causal connection between the two will be examined in more detail. It is first necessary to address an important question concerning the nature of routines: are they organizational dispositions or organizational behaviours?

Some confusion persists on this question. In their 1982 book, Nelson and Winter sometimes treat routines as dispositions, but otherwise described them as behaviours. For example, Nelson and Winter (1982, p. 15) write: 'It is that most of what is *regular and predictable* about business behavior is plausibly subsumed under the heading "routine"'. But they go on in the same sentence to describe routines as 'dispositions … that shape the approach of the firm' to problems. Routines are also treated as 'organizational memory', which refers more to capabilities than to behaviour.

Another passage introduces the useful analogy between a routine and a computer program, but repeats the same confusion. Nelson and Winter (1982, p. 97) see a 'routine' as being like a computer 'program', referring thereby 'to a repetitive pattern of activity in an entire organization' as well as to skills or capacities. But there is a difference between a computer program and the computer's output or behaviour. The computer program is a rule-based system, with a generative coding that, along with other inputs, determines the computer's output or behaviour. Nelson and Winter conflate generative and dispositional factors such as the computer program with outputs such a 'repetitive pattern of activity' or 'performance'.

Nelson and Winter (1982) refer repeatedly to 'routines as genes'. This is another useful analogy. But of course, routines are very different from genes. Routines do not replicate biologically and they are much less enduring. All analogies are inexact in some respects and must be handled with care, as Nelson and Winter are fully aware. The gene analogy usefully points to routines as relatively durable carriers of information through shorter periods of time, with the algorithmic capacity to generate particular outcomes in given circumstances. Routines are like genes in the sense that they are both generative, rule-like structures and potentialities. However, routines (like genes) cannot be both generative structures and outcomes of such structures. This point is not about the appropriateness or otherwise of biological analogies, but about the clear meanings of words and their ontological references.

Winter (1995, pp. 149-50) distinguishes between a 'routine in operation at a particular site ... a web of coordinating relationships connecting specific resources' and the 'routine *per se* – the abstract activity pattern'. But the one term 'routine' cannot apply to both the 'web of coordinating relationships' and the 'activity pattern' that is the outcome of the coordinating structure and its environmental triggers; it cannot usefully denote both potentiality and actuality. It has to denote one or the other, but not both.

At root there is a philosophical problem here, which is worthy of brief discussion. Basically, the essence of what an entity *is* cannot be entirely appraised in terms of what an entity *does*. If we make this confusion, then we wrongly imply that when the entity interrupts its characteristic activity, it ceases to exist. Birds fly. But what defines a bird is the (existing or past) *capacity* to fly, not flying itself. If a bird were wrongly defined as a flying animal, then any bird sitting on a branch or pecking on the ground would cease to be a bird.

Accordingly routines are not behaviour; they are stored behavioural capacities or capabilities. Consider a firm in which all employees and managers work between 9am and 5pm only. During this working day a number of organizational routines can be energized. At other times the firm is inactive. But the routines do not all disappear at 5pm, to reappear mysteriously the next day. The routines-as-capacities remain, as long as the individuals have the capacity and disposition to work again together in the same context. Subject to this condition, the routines can be triggered the next day by appropriate stimuli.

Aristotle made the central philosophical point here, more than 2300 years ago. In his *Metaphysics* Aristotle (1956, pp. 227-8) criticized Eucleides of Megara – a disciple of Socrates – and his school

> who maintain that a thing *can act* only when it *is acting*. But the paradoxes attending this view are not far to seek. … Now if a man cannot have an art without having at some time learned it, and cannot later be without it unless he has lost it, are we to suppose that the moment he stops building he has lost his art? If so, how will he have recovered it if he immediately resumes building? The same is true of inanimate objects. … The Megaric view, in fact, does away with all change. On their theory that which stands will *always* stand, that which sits will *always* sit; … Since we cannot admit this view … we must obviously draw a distinction between potentiality and actuality.

An enduringly relevant point here is that definitions or ontologies that are based on behaviour cannot cope with instances where the behaviour changes or ceases. But the capacity to produce the original characteristic behaviour remains, and this capacity, not the outcome, defines the essence of the entity. Although ancient, this point is not arcane; it is widely utilized in modern realist philosophy of science. Central to most strands of modern realist philosophy is the distinction between the *potential* and the *actual*, between dispositions and outcomes, where in each case the former are more fundamental than the latter.

Science is about the discovery of causal laws or principles. Causes are not events; they are generative mechanisms that can under specific conditions give rise to specific events. For example, a force impinging on an object does not always make that object move. The outcome also depends on friction, countervailing forces, and other factors. Causes relate to potentialities; they are not necessarily realized in outcomes. As Veblen (1919, p. 89) put it: 'The laws of nature are … of the nature of a propensity.' Hence there must be a distinction between an observed empirical regularity and any causal law that lies behind it. Similarly there must be a distinction between the capacities and behaviours of an entity.[4]

In biology, genes and genotypes are wholly potentialities; they are not behaviours. In the socio-economic domain, the closest things to genotypes are the generative rule-like structures inherent in ingrained individual habits and in organizational routines. Habits and routines are thus understood as conditional, rule-like potentialities or dispositions, rather than behaviour as such. The key distinction in the

[4] For realist accounts upholding a distinction between generative mechanisms or causal powers, on the one hand, and outcomes or events, on the other, see for example Bhaskar (1975), Harré and Madden (1975), Popper (1990).

socio-economic sphere is between habits and routines as dispositions, on the one hand, and manifest behaviour, on the other hand.

In this light, any emphasis on the allegedly *predictable* character of routines is misplaced. Predictions relate to outcomes or events, not to causal laws, rules or generative structures. The moderately dependable feature of a routine, rule or computer program is not one of predictability but of durability. Routines (or rules or computer programs) are usually conditional on other inputs or events. As a result any predictability does not stem from the routine alone but from the predictability of these other inputs. For example, a firm may have a fixed mark-up pricing routine of adding 20 per cent to the unit cost of its products. If costs were capricious and highly variable, as they might be under some circumstances, then the resulting price would be equally unreliable. The relatively enduring and persistent quality of a routine is not its outcome but its generative, rule-like structure.

While a consensus has been established that a routine is an organizational rather than an individual phenomenon, some confusion remains on the above points, and this has led to some conceptual and empirical difficulties.[5] Some of these difficulties can be overcome by consistently treating a routine as an organizational capacity and generative structure, analogous to biological genes or computer programs, but having distinctive features of their own.

To their credit, both Nelson and Winter are now more inclined to describe the routine in terms of a capacity. Nelson and Winter (2002, p. 30) write: 'we treat *organizational routine* as the organizational analogue of individual skill.' A similar attitude is evident elsewhere. Barbara Levitt and James March (1988, p. 320) write: 'The generic term "routines" includes the forms, rules, procedures, conventions, strategies, and technologies around which organizations are constructed and through which they operate.' Another useful definition of a routine as a potentiality or capability, rather than behaviour, is found in the discussion in Michael Cohen *et al.* (1996, p. 683) 'A routine is an executable *capability* for repeated performance in some *context* that [has] been *learned* by an organization in response to *selective pressures.*'

A routine is here defined as a generative structure or capacity within an organization. *Routines are organizational dispositions to energize conditional patterns of behaviour within an organized group of individuals, involving sequential responses to cues.* The next section raises the general questions of how routines work within organizations and how they carry information.

3. How do Routines Carry Information?

The analysis of how routines endure and replicate is enormous and incomplete (Hodgson, 2003). At present, our general understanding is limited, and progress depends largely on the accumulation of detailed case studies. As Winter (1990, p. 270) notes, so far 'little attention has been paid to the mechanism by which whatever-it-is-called is transmitted' and to its 'replication mechanism'. For Winter (1990, p. 294 n.) this amounts to a regrettable 'vagueness on a key issue'. As Winter (1990, pp.

[5] For discussions of some of these difficulties see Cohen *et al*. (1996), Becker (2001) and Lazaric (2000).

270-5) insisted: 'The question of what is "inherited" and how the inheritance mechanisms works is, however, ... central and ... far from definitive resolution … To develop the routines as genes approach fully, the problem of inheritance mechanisms needs to be dealt with convincingly.'

To understand how routines work it is necessary to consider how any tacit or other information associated with a routine is preserved and replicated. A very useful study in this regard is by Michael Cohen and Paul Bacdayan (1994). They use the distinction in psychology between procedural and other, more cognitive forms of memory, such as semantic, episodic or declarative memory. As psychologists Endel Tulving and Daniel Schacter (1990, p. 301) put it:

> The domain of procedural memory is behavior, whereas that of semantic and episodic memory is cognition or thought. Cognitive memory systems have the capability of modeling the external world – that is, of storing representations of objects, events, and relations among them – whereas procedural memory does not have this capacity.

Procedural memory is triggered by preceding events and stimuli. It typically leads to behavioural responses and has a major tacit component. It is potential action that is energized by social or other cues. 'Procedural knowledge is less subject to decay, less explicitly accessible, and less easy to transfer to novel circumstances' (Cohen and Bacdayan, 1994, p. 557).

Routines depend upon a structured group of individuals, each with habits of a particular kind, where many of these habits depend upon procedural memory. The behavioural cues by some members of a structured assembly of habituated individuals triggers specific habits in others. Hence various individual habits sustain each other in an interlocking structure of reciprocating individual behaviours. Together these behaviours take on collective qualities associated with teams. But both individuals and structures are involved throughout. The organization or group provides a structured social and physical environment for each individual, including rules and norms of behaviour, of both the explicit and the informal kind. This environment is made up of the other individuals, the relations between them and the technological and physical artefacts that they may use in their interactions. This social and physical environment enables, stimulates and channels individual activities, which in turn can help trigger the behaviour of others, produce or modify some artefacts, and help to change or replicate parts of this social and physical environment.

Partly because of procedural memory, organizations can have important additional properties and capacities that are not possessed by individuals, taken severally. The organization provides the social and physical environment that is necessary to enable specific activities, cue individual habits and deploy individual memories. If one person leaves the organization and is replaced by another, then the new recruit may have to learn the habits that are required to maintain specific routines. Just as the human body has a life in addition to its constituent cells, the organization thus has a life in addition to its members. The organizational whole is greater than the sum of the properties its individual members, taken severally. The additional properties of the whole stem from the structured relations and causal interactions between the individuals involved (Blitz, 1992; Hodgson, 2004; Wiessman, 2000).

A routine derives from the capacity of an organization to provide conditions to energize a series of conditional, interlocking, sequential behaviours among several individuals within the organization. Cohen and Bacdayan (1994, p. 557) write: 'The routine of a group can be viewed as the concatenation of such procedurally stored actions, each primed by and priming the actions of others.' This statement captures the dependence of routines on procedural memory, but is somewhat ambiguous concerning the genotypic or phenotypic status of a routine.

As argued above, routines are not behaviour; they are stored behavioural capacities or capabilities. These capacities involve knowledge and memory. They involve organizational structures and individual habits which, when triggered, lead to sequential behaviours. But this does not mean that a routine can be fully codified. Routines are not necessarily nominal, codified or officially approved procedures. Routines generally rely on informal and tacit knowledge, and this fact is clearly relevant for understanding their replication.

The temporal durability of routines and the way that they can embody knowledge 'forgotten' by individuals is illustrated by an anecdote related by Elting Morison (1966). A time-and-motion expert was studying film footage of Second World War motorized artillery crews. He was puzzled by a recurring three-second pause just before the guns were fired. An old soldier also watching the film suddenly realized that the three-second pause had originated from the earlier era in which the guns were drawn by horses, and the horses had to be held and calmed in the seconds just before the guns went off. Despite its eventual redundancy, this part of the routine had survived the transition from horse-driven to motorized artillery. Part of the knowledge held in a routine can become obsolete, yet still be reproduced, like the examples of 'rudimentary organs' discussed by Charles Darwin (1859, pp. 450-8).

Just as habits replicate from individual to individual, routines replicate from group to group and from organization to organization. In studies of technological diffusion, organization studies, and the strategic management literature there is some discussion of the diffusion or replication of routines (Aldrich and Martinez, 2003; Becker and Lazaric, 2003; DiMaggio and Powell, 1983; Hannan and Freeman, 1984, 1989; Lazaric and Denis, 2001; Levitt and March, 1988; Rogers, 1995; Stinchcombe, 1990; Szulanski 1996, 2000; Zucker, 1987). Prominent mechanisms for the replication of routines involve the movement of employees from organization to organization, or independent experts or consultants that help to transfer knowledge and experience gained in one context to another. The above authors cite case studies involving the transfer of technologies, management procedures, corporate multidivisional structures, accounting conventions and much else. What is central to these transfers is the replication of practices and organizational relationships. What is generally critical is the capacity of the receiving organization to accommodate and utilize these practices and relationships in the context of its own ingrained culture of habits and beliefs.

In some respects the replication of routines may be more difficult than the replication of habits from individual to individual. Take the mechanism of imitation. Among individuals, any evolved capacity to imitate others must involve the ability to sense the more significant actions, and the tacit rules and meanings associated with behaviour. This capacity would have evolved over millions of years. By contrast, complex organizations are extremely recent in human history. Many organizations

may have evolved only limited capacities to discern and prioritize the important rules and meanings. It is likely that replication through imitation is even more difficult with (and at the level of) organizations than it is with individuals.

Nevertheless, as noted in the organization studies literature, many examples of successful routine replication exist. They typically involve the combination of codifiable information and instructions with extensive personal example, advice and contact, where the receiving organization has sufficient plasticity to usefully absorb and accommodate the routine. Sometimes routines are spread as a result of laws or rules that emanate from a third organization, such as the state or an association of employers. Otherwise the replication of routines can occur as the result of the strategy of its receiving organization, or it can result from lower-level contact, stimulation and imitation. Routines replicate, and they do so on a substrate of organized and habituated individuals.

There is an important and ongoing debate concerning the degree of durability of routines. Michael Hannan and John Freeman (1989) are leading proponents of the view that the capacity to change routines within organizations is relatively limited, and that changes in the population of routines within industries or societies largely comes about through the survival or extinction of specific organizations, and the consequence persistence or disappearance of the routines they carry, rather than through modifications in the routines themselves. This is an important area of ongoing enquiry.[6]

This raises theoretical and empirical questions concerning how routines are selected and the structures they require in order to survive. One approach is to establish in this context the general distinction between a 'replicator' and an 'interactor', as found in the philosophy of evolutionary systems (Hull, 1988). It is beyond the scope of this essay to go into details, but the key points can be summarized in brief. In a general and meaningful sense, routines may be regarded as replicators, because when routines are copied they satisfy the necessary basic criteria of causation, similarity and information transfer (Godfrey-Smith, 2000; Sperber, 2000; Hodgson, 2003). What then are the corresponding interactors? David Hull (1988, p. 408) defines an interactor as 'an entity that directly interacts as a cohesive whole with its environment in such a way that this interaction *causes* replication to be differential'. The term 'cohesive whole' indicates that its components stick together and remain united. This must mean at least that all the components depend critically on the survival of the whole, and that to some degree the components depend on the survival of each other. Refining this definition still further, Geoffrey Hodgson and Thorbjørn Knudsen (2004) argue that a firm may be regarded as an interactor, and consequently as a 'vehicle' for its inherent habits and routines. The fate of a routine is often dependent on the fate of its host firm. It should be pointed out, however, that although this type of evolutionary approach has a long history (Hodgson, 2004), at least in its present form and context it is in the early stages of its development, and many outstanding conceptual problems remain to be resolved.

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[6] Usher and Evans (1996) provide a useful review of this literature, with further evidence. However, it has been argued elsewhere that their characterization of this debate as between 'Darwinian' and 'Lamarckian' concepts of change is at best highly misleading (Hodgson and Knudsen, unpublished b).

4. Conclusion

This essay has explored the concept of a routine in fundamental terms, using insights from philosophy, psychology and social theory. A routine is here defined as a generative structure or capacity within an organization. *By definition, routines are organizational dispositions to energize conditional patterns of behaviour within an organized group of individuals, involving sequential responses to cues.* There are important philosophical reasons, endorsed by modern philosophy of science, why routines should be defined as organizational dispositions or capacities, rather than behaviour as such.

Just as habits relate to individuals, routines relate to organizations. Both are socially transmitted dispositions, formed through repeated behaviours. Routines themselves are structures of interlocking individual habits. But routines are more than mere aggregations of habits, because they also depend on the emergent properties of organization itself, emanating from structured causal relations and interactions between individuals.

One of the reasons why the study of routines is important for the study of business practice is that they are repositories and carriers of knowledge and skill. The routine is often the means through which individual skills are triggered and energized. One psychological mechanism that is important here is procedural memory, which means that some powers of recall can be enhanced when triggered by cues provided by others. In this manner the routine as a whole becomes more than the sum of the capacities of the individuals involved, taken severally.

Without going into details, this essay has pointed to a further agenda of conceptual enquiry, inspired by evolutionary principles taken from the modern philosophy of biology. In theoretical, conceptual and empirical terms, the study of routines offers an exciting agenda for future research.

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