ORGANIZATIONAL ROUTINES AS SOURCES OF CONNECTIONS AND UNDERSTANDINGS*

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ABSTRACT

Organizational routines are increasingly identified as an aspect of organizations that allows them to achieve the balance between adaptability and stability. We contribute to this discussion by showing that the connections that organizational routines make between people contribute to both stability and the ability to adapt. We argue that the connections between people that are formed as they engage together in organizational routines are important for developing understandings about both what needs to be done in a specific instance of performing a routine and about the goals of the organization that routines presumably help accomplish. Together the two sets of understandings influence organizational performance by affecting the ability of organizations to adapt to changing circumstances. These arguments lead to a general recognition of the importance to organizations of connections and the suggestion that the connections, themselves, may be an important outcome of organizational routines.

INTRODUCTION

Organizations consist of people producing some form of common work. Much of organization theory has been concerned with how to coordinate the activities of people in organizations (March and Simon, 1958; Stinchcombe, 1960, 1990; Thompson, 1967). Organizational routines are one form of coordination often used in organizations (Cyert and March, 1963; March and Simon, 1958; Nelson and Winter, 1982; Simon et al., 1950).

Change is another concern of organization scholars that has increasing importance (Perrow, 1994; Weick and Quinn, 1999). New technologies and an increasingly global economy have resulted in an era of rapid change and a demand for high quality performance under variable circumstances. Organizations must be

able not only to coordinate their activities but also to adapt these activities. Often such adaptation must take place on the spot (Hutchins, 1995; Orr, 1996; Weick and Roberts, 1993).

Organizational routines have a paradoxical quality when it comes to change. Some scholars have noted their contribution to organizational stability (Cyert and March, 1963; Hannan and Freeman, 1983; Kerr and Slocum, 1981; Nelson and Winter, 1982; Simon, 1945). Focusing on this aspect of routines has led to characterizing routines as mechanical and to likening them to computer programs (Cohen et al., 1996; Cyert and March, 1963; March and Simon, 1958; Nelson and Winter, 1982; Stinchcombe, 1990). Some of the scholars who liken routines to computer programs, however, have also noted that organizational routines adapt or mutate (Cohen and Bacdayan, 1994; Cyert and March, 1963; Nelson and Winter, 1982). And an increasing body of observations and theory has shown that organizational routines are an important part of organizational flexibility and change (Adler et al., 1996; Adler et al., 1999; Feldman, 2000; Feldman and Pentland, 2000; Hutchins, 1991, 1995; Miner, 1991; Naduzzo, Rocco and Warglien, 2000; Pentland and Rueter, 1994). Thus, organizational routines appear to be involved in both the stability intrinsic to coordination and to the adaptability intrinsic to change (Cohen and Bacdayan, 1994; Cohen et al., 1996; Feldman and Pentland, 2000; Miner, 1991; Naduzzo et al., 2000).

Little work, however, identifies the mechanisms that allow organizational routines to contribute to both stability and change (Feldman and Pentland, 2000). In this paper we suggest that the connections that organizational routines make between individuals constitute one of these mechanisms. We argue that these connections enable the people who perform organizational tasks to develop shared understandings about what actions will be taken in a specific routine and how these actions relate to a larger organizational picture. These shared understandings help organizations maintain a pattern of behaviour that coordinates the actions of individuals while also adapting to variations in the internal and external environment. Figure 1 overviews this argument.

We continue this introduction by defining and discussing the two major concepts that our argument rests on: organizational routines and connections. We then discuss how routines make connections. In a third section we discuss how connections create shared understandings. In the fourth section we discuss how shared understandings contribute to adaptability as well as to stability. We finish with a discussion of the implications raised by our perspective, in particular, the implications for the ways that we study and evaluate routines.

Defining Terms: Routines and Connections
Scholars studying organizational routines have advanced many ways of thinking about them. March and Simon (1958) have likened organizational routines to computer programs and subprograms. Cyert and March (1963) have shown that routines are basic elements of organizational decision-making. Nelson and Winter (1982) describe routines as the skills and capabilities of organizations, as truces among organizational members and as the genetic material of organizations. Pentland and Rueter (1994) have likened organizational routine to a grammar of organizing. Cohen et al. (1996, p. 684) have defined an organizational routine as 'an executable capability for repeated performance in some context that has been learned by an organization in response to selective pressures'. A common thread

Routines

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make

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Connections

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enable

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What to do in a
particular
instance

Shared Understandings about

**Why some
actions are
appropriate**

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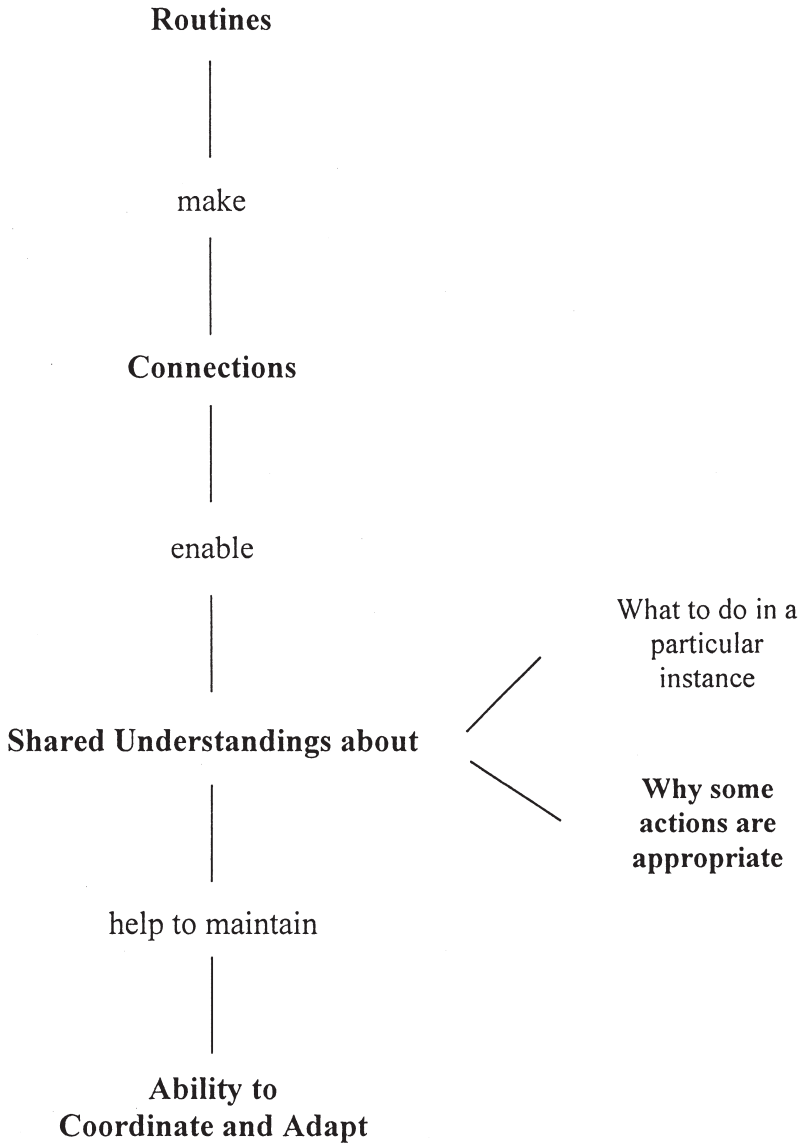help to maintain

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**Ability to
Coordinate and Adapt**

Figure 1. Outline of argument

throughout these conceptualizations is the view of organizational routines as *recurring patterns of behaviour of multiple organizational members involved in performing organizational tasks.* This is what we take to be our definition of organizational routine. Because – as this definition implies – organizational routines involve more than one person in more than one interaction, they create the opportunity for connections between people, as explained below.

Connection is another term with a rich history. Connections have been viewed as elements of communication networks (Barley, 1990; Brass, 1985; Granovetter, 1973, 1974; Ibarra, 1992; Sproull and Kiesler, 1991; Uzzi, 1997), and have been

identified to be products of physical closeness or propinquity (Barnlund and Harland, 1963; Festinger et al., 1950; Gullahorn, 1952; Newcomb, 1956). Two key outcomes of connections are social support (Wellman and Frank, 2001) and information transfer (Monge and Contractor, 1999), to the point that connection to other people has been argued to be a strong and basic human motivator (Baumeister and Leary, 1995; Maslow, 1954; Ronen, 1994). The underlying message of available analyses is that connections are based on interpersonal interactions that take place in the context of a temporally stable and enduring framework. Thus, we define connections as *interactions between people that enable them to transfer information*. Based on previous research we assume these connections enhance the sense of mutual understanding, though not necessarily producing agreement among those connected. Connections are thus similar to a 'tie' in network theory, which enables the exchange of information and engenders a certain degree of reliability of the behaviour of partners to the tie (Monge and Contractor, 1999). Similar to ties, which imply proximity and therefore familiarity with other elements of a network, connections provide knowledge about other participants in a routine.

Introducing the concept of connections into analyses of routines elevates the role of people in organizational routines. Previous analyses of organizational routines have not focused on the connections that routines make between and for people. This omission may be attributable to the fact that much of the study of routines have focused on routines in the abstract rather than routines as they are performed and has, thus, been divorced from the people who perform the routine (Feldman, 2000; Feldman and Pentland, 2000). In a focus on connections the importance of including people in the analysis of organizational routines becomes increasingly clear.

ROUTINES MAKE CONNECTIONS

Organizational routines entail multiple interpersonal interactions with other organizational members. They specify for organizational members the respective other members with whom behaviour needs to be coordinated. As a result, they establish connections among people essentially constructing networks that facilitate the exchange of information and the development of understandings.

In studies on the impact of propinquity a basic and recurring finding is that people connect to those to whom they are physically closer, or to those with whom they are in close contact (Newcomb, 1967). Distance itself is not the explanatory mechanism, but rather the sharing of common resources and the need to function in interdependent roles *vis-à-vis* these resources (Newcomb, 1967). These dynamics were shown early on to explain marriage patterns (Davie and Reeves, 1939), and especially marriage among individuals who happen to share floors of a residence hall (Bossard, 1932). The argument was that the shared reliance on common resources leads to the development of mutual expectations about behaviour, which is precisely the notion of 'trust' identified by network theorists. Trust in network theory is not necessarily liking, but rather knowing what will happen (Monge and Contractor, 1999).

Individual participants in a routine repeatedly encounter each other's performance of related aspects of the routine. The routine thus prescribes contact among

these individuals. Such encounters create 'ties' among individuals, producing some form of a network of routine participants. Some members are likely to have more frequent encounters with others, and some encounters are likely to be more critical or have greater impact than others producing stronger (or respectively weaker) ties. Yet the total set of interactions enveloped in a routine suggests a set of connections among people.

To illustrate, consider the evolution of a hiring process from the perspective of the connections it involves. An office manager may decide members of her department need the support of a computer programmer, and might embark on what we can loosely call 'a hiring routine'. This routine is actually an amalgam of multiple smaller routines, each of which embodies multiple connections. In knowing the broad hiring routine, the manager actually knows how the organization operates. Thus, in knowing this routine the office manager knows the various parts of the organization she has to contact: the accounting department (to see how this employee could be budgeted), the salary and benefits department (to learn the salary and benefits to be offered to such an employee), and the public relations department (to arrange for using the media for recruiting). Depending on organizational policies, contacts with other departments may also be required (e.g., the college placement office, or the human resources department for internal placements). For the manager to perform the 'hiring routine', she is required to initiate these multiple connections.

Each of these contacts comprises a routine in itself and entails a set of connections. For each contact between the hiring manager and different parts of the organization, the manager's office assistant is likely to come in contact with office assistants in other parts of the organization (the accounting area, the human resources area, and the public relations area). Each of these contacts provides her with a link to, or a view of, other parts of the organization. Additional supporting staff employees may be involved in the process as well. An office assistant may be asked to type the job description, fax an employment ad, or contact a temporary employment agency. The assistant may obtain information for the job description from the office manager, from the office manager's assistant, from the HR department, or from some other member of the organization (e.g., a clerk in the information systems department).

These multiple contacts suggest a picture that is strikingly similar to a network of ties. Some contacts may rely on ties that are frequently exercised and previously established. Some may be more positively evaluated (trusted) than others. Some contacts may be ad hoc initiatives to meet a one time or specific need, but they would still be performed as part of the hiring routine. Some contacts may target seemingly peripheral sources (such as a knowledgeable secretary from a neighbouring department) for information about the best course of action. Again, these contacts would be initiated in the course of operating the organizational routine. Some interactions may be dyadic (e.g., an area secretary talking to an accounting specialist). Others may be collective (e.g., a group meeting may be called to decide about the content of an employment ad).

The hiring routine continues to produce connections once a pool of potential employees is decided upon. If a temporary employee is sought, presumably a temporary agency reduces the efforts involved. But there are still multiple connections involved. Someone in the department will necessarily be in contact with the temporary agency, and with the accounting department to arrange for the contract.

If a permanent employee is sought, current employees may be in some contact with applicants for screening applications, scheduling interviews, or actually interviewing. Employees screening applications and scheduling interviews will necessarily be in contact with those conducting the interviews and with the interviewees. The interviews themselves may be conducted by the office manager alone, but office employees will help set up the technicalities of the interviews, coordinating the meeting rooms, greeting interviewees, etc. If employees other than the office manager participate in the interviews, some form of connection will be created between them (the employees) and the pool of applicants. Following the interviews office employees may be in contact with each other, with the manager, or with other departments in deliberations about who to hire. Employees may also be in contact with applicants to whom a job is offered or whose application is declined.

Clearly organizations vary in how their hiring routines are conducted. But, as is evident in this description a host of individuals and a multitude of connections is inevitably embedded in the execution of what has previously been referred to abstractly as 'a hiring routine'. Connections are made among individuals responsible for multiple elements composing the routine. Information is exchanged at each connection, and based on this information exchange individuals learn about other members' tasks and perceptions of the routine. Such learning necessarily inspires interpretations because at each step what has been learned is likely to influence how people act. As the context varies from one hiring episode to another, the specific events that take place and the particular individuals involved and the understandings developed also vary. The overall pattern, however, is likely to be similar in many ways, thus giving regularity to the abstraction.

This regularity is what led to the previous focus on the mechanical nature of routines. Focusing on the multiple connections essential for this regularity helps to recognize the multiple points at which connections are made, and consequently information is acquired and interpretations are made by individuals involved in the routine. Such a focus helps reveal how routines embody multiple connections and helps explain the adaptive nature of the execution of routines. In a specific occurrence of the example above, each individual participant may decide on a slightly different action based on information acquired through one or more of the connections.

To illustrate, an organizationl hiring routine may allow for advertising either in a national newspaper or in a local newspaper. The connection with the public relations department provides line managers with information about the costs and benefits of each form of advertising. The connection may also advise a line manager about previous actions of other line managers in similar circumstances. This information may lead one line manager to post an employment ad in a national newspaper and another manager to post two or three ads in local newspapers. In both cases a connection (or tie) between the two individuals (the line manager and the public relations manager) occurred, and new information was learned by both parties. Although the ultimate action – or the tangible and more easily noticeable outcome of the routine may vary, an additional outcome is a set of connections and the information they provide to the people involved.

The connections among the multiple individuals involved in a routine will not all be of the same strength. Recurring interpersonal exchanges inherent to an organizational routine can be expected to produce a stronger sense of connection

than less frequent encounters, just like more frequent social encounters are known to produce stronger social bonds (Newcomb, 1967). Mere contact with another person is known to produce a sense of affinity and connection (Zajonc, 1968), but more frequent and interdependent contact is likely to produce stronger connections and a better understanding of the perspective offered by the other person (Homans, 1950). Similar to other forms of learning, repeated exposure to a behaviour or a point of view presented by a person with whom one connects is likely to yield more knowledge acquisition from and about the other person. Recurring interactions produce an increasingly refined knowledge of one's partners to the interaction (Homans, 1950; Newcomb, 1967).

Thus, the abstract notion of a routine embodies a set of connections among individuals that affects the perspectives available to these individuals. These perspectives may influence what people do in a particular instance of the routine (i.e., it may determine if a manager posts an employment ad in a national or a local newspaper). These perspectives also influence the broader understanding that the individuals involved have of the routine and of the organization. That understandings are developed is independent of the outcome of the routine (which ad is posted, who is hired, why or how). Each individual employee is connected, through his or her role in a routine to other employees who represent a certain part of the routine. But the complete set of perspectives afforded by the complete set of connections that all organizational routines produce coalesce into an image of the organization. The network of connections a routine produces can be thought of as the web of perspectives maintained by routine participants. This set of perspectives is likely to lead to collectively shared understandings among routine (and therefore organizational) participants, as we discuss next.

CONNECTIONS AND SHARED UNDERSTANDINGS

Organizations are full of connections (Simon, 1981), to the point that some scholars argue that organizations are connections (Sandelands and Stablein, 1987). One particular reason that connections are central to organizations is that the communication that takes place through these connections helps to create shared understandings.

Verbal communication among organizational participants is one way shared understandings are created. Scholars have shown the power of conversation to both create and reflect shared understandings among organizational participants (Boden, 1995; Donnellon, 1996; Orr, 1996). But the mechanism of coordination may also be nonverbal. People may learn from and adjust to others' physical or psychological states by observing physical stature, abilities, limitations or position (Cohen and Bacdayan, 1994; Weick and Roberts, 1993). Sharing boundary objects and attending to perspectives about these objects may key individuals to differences in the perspective of each of the participants (Carlile, 1997). Organizational routines place organizational participants in a position to have repeated verbal and nonverbal communication with one another. In this way organizational routines put organizational members in a position to create shared understandings.

There are two levels of such understanding that organizational routines are particularly suited to developing. One level is what actions will be helpful in a

particular instance of routine performance. The other level invokes a larger
context and involves the broad reasons for why particular actions are appropriate
or inappropriate (Bourdieu, 1990). The connections made by organizational rou-
tines operate at both of these levels and affect understandings about both *what*
actions are to be taken in performing the routine and about *why* the routine is
being performed in the first place. It may not be possible to separate these two
types of understandings in practice, but the distinction between them is concep-
tually useful. The former, as elaborated next, regards an understanding about the
specific context in which a particular instance of a routine is being performed and
allows the individuals involved to discuss the tasks involved and to coordinate their
behaviour with one another.

Shared Understandings about Performance
At the simplest form, connections between the multiple individuals participating
in a routine enable shared understandings about the specific context in which a
particular instance of a routine is being performed. This happens because
connections allow the individuals involved to discuss the tasks involved and to
coordinate their behaviour with one another. People involved in the routine may
have substantially different understandings about what needs to be done and how.
Connections between or among people involved in a particular routine provide
an opportunity to explore the different interpretations and, at times, to come to
a common understanding. The connections also allow them the possibility of
accommodating one another. For example, one person may find the deadlines
required by the routine difficult to meet and the other people in the routine may
be able to help out by adjusting their schedules.

The role of routines in creating shared understandings that influence per-
formance is illustrated by the work on distributed cognition. Scholars have shown
that the connections that routines make between individuals can create a system
in which there is more knowledge available to the system than the cumulative
knowledge of the individual actors (Cohen and Bacdayan, 1994; Hutchins, 1995;
Sandelands and Stablein, 1987; Weick and Roberts, 1993). Hutchins (1995, p. 269)
provides a good example of such a system in his work on airplane cockpit speeds.
He describes the process through which air traffic controllers and pilots calculate
and attain the appropriate speeds for landing an aircraft. The smallest version of
the routine connects people on the ground with the pilot not flying (PNF) who is
connected with the pilot flying (PF).[1]

> The pilot flying is concerned primarily with control of the airplane. The PNF
> communicates with air traffic control (ATC), operates the aircraft systems,
> accomplishes the checklists required in each phase of the flight and attends to
> other duties in the cockpit.

Hutchins (1995) describes this division of labour as an allocation of scarce
resources. During descent, when the demands on the visual attention of the pilot
flying are most intense, the routine allows the pilot flying to allocate almost all his
or her visual attention to monitoring the relationship between the airplane and
the ground. The pilot not flying, with the help of information from the ground
and various devices in the plane, calculates the appropriate speeds, communicates
them verbally and marks them on a dial visible to both pilots.

It is likely that facilitating control was the original justification for this procedure. However, this division of labor also has a very attractive system-level cognitive side effect in that it provides for additional redundancies in checking the bug settings and for the correspondences between speeds and configuration changes. (Hutchins, 1995, pp. 278–9)

In other words, the connections that the routine makes allow the participants in the routine to come to a shared understanding about the steps involved in landing the airplane safely.

Weick and Roberts in their study of aircraft carriers point out that through such processes as described above, individuals can 'act as if they are a group' (1993, p. 360). At the same time, however, the individuals do not lose their abilities to think and act, to assess the actions of others and to act in an appropriate manner. Take, for instance, the following description:

Even though pilots [on an aircraft carrier] have to rely on the catapult crew, they remain vigilant to see if representations are similar. . . . If a person on the deck signals the pilot to reduce his [sic] engines from full power, he won't do so until someone stands in front of the plane, directly over the catapult, and signals for a reduction of power. Only then is the pilot reasonably certain that the joint situation has changed. He now trusts that the catapult won't be triggered suddenly and fling his underpowered aircraft into a person and then into the ocean. (Weick and Roberts, 1993, p. 363)

The connections of the pilot to the catapult crew allow the people engaged in this routine to develop a shared understanding about the safety of reducing the power of the aircraft.

These examples are extreme in that there is a particularly tight relationship between actions and outcomes. Failure to develop appropriate shared understandings can result in death. Similar processes, however, accompany participants in less extreme routine circumstances. Suchman's study of filing clerks illustrated that a filing routine provided a mere template for clerks to follow and that the actual performance of filing required understandings about the particular variations in each circumstance and about the overall purpose of the filing process (Suchman, 1983). Moreover, especially in non-extreme circumstances understandings attained through connections with other participants in the routine address the broader perspective of the larger organizational picture. It is to this broader perspective that we now turn.

Shared Understandings about the Organization
The second set of understandings advanced by routines is understandings about the larger organizational context. Such understandings comprise ideas about what the organization does and why, as well as who is important to the organization (Lave and Wenger, 1991). For example, the inclusion of certain people or of people with a certain point of view in a routine may not influence the actions taken by other participants, but it offers information about the importance of these people and their points of view to the organization. Exclusion of certain people or certain points of view from a routine also sends a message that these people and their concerns are *not* central to the task accomplished by the routine.

Westley's (1990) discussion of the inclusion and exclusion of middle managers from strategic conversations provides a good example here. The tasks of these conversations did not seem to need information available from middle managers. But participation in the conversation routine is shown to relate to members' sense of understanding of the larger context. Westley (1990) describes strategic planning meetings from which middle managers are often excluded. These managers report frustration about missing the conversations and the resulting understandings that the meetings provide. The meetings are a critical part of the organizational routine of strategic planning and Westley suggests that the people not included in this routine miss out both on the opportunity to become members of powerful coalitions and the access to sensemaking that the meeting discussions provide. In our language, this exclusion means that middle managers miss the opportunity to connect with others. This lack of connection means that both middle managers and others develop understandings about the organization that do not include the perspectives of middle managers. Thus, the strategic planning meetings could function without middle managers. But this exclusion means that both those present and those not present (the middle managers) lose some form of understanding.

One subset of such broad understandings substantiated through routines regards the tasks performed by various organizational members and the overall organizational goal that these tasks help accomplish. The information exchanged in each contact point involved in a routine gives both partners to the contact an image of the task and the perspective of the other partner. To illustrate, the line manager described above as performing his or her part in an organizational hiring routine comes in contact with other organizational members from the accounting department, the human resources department, and the public relations department. These contacts inform each of the managers about the boundaries of their tasks, expanding each of their understandings of the multitude of tasks performed in the organization. Furthermore, each contact expands their understandings of the multiple perspectives on the overall organizational goals. As part of the connection to the public relations department, for example, the line manager may learn novel information about the organizational public relations efforts. The perspective that individual organizaional members have of their organization is naturally limited, and the task performed by each individual is but a small element of the overall organizational task. Contacts with other members provide an opportunity to expand one's perspective.

The information obtained through these contacts can also help clarify one's understanding of the organizational goals and priorities. For example, organizations are likely to make different allowances for recruiting different types of employees, according to the centrality of these employees to the organizational tasks or the priorities attributed to these employees by the organization. Precise knowledge about these allowances, however, likely rests within the human resources department rather than the line department. A line manager is likely to learn about the different allocations and the priorities they represent when he or she contacts a recruiting specialist from the human resources department as part of performing a hiring routine. Learning that the organization allows bigger funds for recruiting marketing specialists than for recruiting research and development specialists can help clarify to a line manager that the organization considers marketing to be a higher challenge faced by the organization than research and development.

A second subset of the broad understandings that routines and the connections they embody help produce is far more abstract, but not less important. Pratt and Rafaeli (1997) argue and illustrate that tangible organizational symbols are vehicles that help organizational members comprehend the abstract notion of organizational identity. In a similar vein, we suggest that the information provided by concrete connections made by organizational routines helps establish broad and abstract shared understandings among organizational members about organizational power and organizational identity.

Connections and power relations. Connections made through organizational routines can clarify the power relations in organizations for people involved (as well as those not involved) in a routine. This outcome of routines is fundamental to organizational performance because power distribution is critical to social and organizational structures (Giddens, 1984). Shared understandings about power and dominance are essential foundations of social order (Hobbes, 1651/1968) and are necessary to the effectiveness of the abstract notion of hierarchy. Interestingly, while routines contribute to the appreciation and shared understanding of, and thus to the creation of hierarchy, hierarchy also influences participation in and behaviour according to organizational routines. Thus the product of routines (shared understandings of organizational power distributions) also influences the compliant performance of routines.

Shotter's (1993) description of routines at an aircraft factory illustrates these dynamics. Shotter (1993, p. xi) notes:

> A thousand or so workers trooped in at 7:30 a.m. through a single little door at the back of the factory, jostling and pushing each other to make sure we clocked in on time, as every minute cost us 15 minutes' pay. The staff came in through big double doors at the front, up imposing steps, at 9:00 a.m.

In this case different routines for coming to work create connections among people involved in the same routine. Connections are created among people of similar status in the organization, which serves to produce understandings regarding status differences in the organization, as well as the respective individual status. The contrast between the routine of coming to work of the line workers and that of the staff in this organization creates two distinct groups, facilitating a shared understanding of two distinct classes. Each individual coming to work connects to others who come to work with him or her, learning from them about their own status. Each individual also learns about the status of others who act out 'the other' version of the coming to work routine. This contrast was but one of many routines creating the same shared understanding of two classes, 'us' and 'them', as illustrated by Shotter's (1993, p. xii) continuation:

> But more than that, 'they' had their lunch on a mezzanine floor raised five feet above 'us' in the lunch room; 'they' had waitress service and white tablecloths, 'we' buttered sliced bread straight from the paper packet on the Formica top of the table.

Thus individuals connected through the same organizational routine come to develop shared understandings about their status in the organization. Individuals

involved in distinct routines (line versus staff workers in the example) come to develop different understandings (low versus high status). Indeed, status difference is not only reified through these routines, but also explains or even becomes the reason for the differences in the routines of coming to work and eating lunch. The shared understanding is that the organization comprises people of different status, and that people of different status deserve different treatments. Of course, the differences do not need to be so stark to be effective and, in some cases, connections made by routines can operate to diminish rather than heighten status differences. But in all cases, shared understandings about power and status produced by routines play out in a variety of other organizational settings and can be used to promote control in the organization (Westley, 1990).

Connections and organizational identity. Connections made through organizational routines can also facilitate the creation of a shared understanding about organizational identity which consists of the core and enduring attributes of the organization (Albert and Whetton, 1985). Dutton and Dukerich (1991) showed how routines for handling homeless people in the NY Port Authority buildings both reflected and shaped the collective understanding of organizational members regarding the identity of the organization. Dutton and Dukerich (546) note:

> Individuals' senses of the Port Authority's identity were associated with a set of routines, or standard procedures for dealing with the issue, whose activation engaged ways of doing things members identified as 'typical of the Port Authority.'

Initially, organizational routines at the Port Authority such as 'throwing people out in the cold' (p. 547) reflected and supported an assumption that the Port Authority was *not connected to* the homeless who inhabited its facilities. This assumption led to the shared understanding that the organization was 'heartless' which was thought by management to be damaging to the organization. To alleviate the damage, a new set of organizational routines was developed. These routines included social workers in making decisions about how to handle the homeless, and about how to use Port Authority facilities and budgets. These connections between traditional Port Authority personnel and social workers created a new organizational identity. The change was so extreme that management became concerned about doing too much on the homeless issue, producing a concern that the organization was straying from their main business of transportation towards being perceived as a social service (p. 547).

Who was connected through the organizational routines affected the shared understandings about why certain tasks were undertaken. When the Port Authority routines connected social workers to traditional Port Authority staff, the shared understanding of the organizational identity changed from an organization that cared only about the people they transported to an organization that also cared about the people who used their facilities for other purposes. Such a change can affect the actions of organizational members in a wide variety of tasks undertaken for the organization. It could affect the way transit police interact with homeless people as well as with paying customers. It could affect how transit facilities are designed. It could even affect how transit operations are scheduled (e.g., avoiding waking up people who sleep in the facility). Thus, it was important

to management that the understandings resulting from the connections with social workers not become the primary understandings, overriding understandings resulting from connections to people who emphasize the transportation functions of the Port Authority.

<h2 style="text-align:center">SHARED UNDERSTANDINGS AND ADAPTABILITY</h2>

Shared understandings are important to organizations because, although they rely on significant planning of routines, there is an essential element of interpretation in implementing organizational routines. Seemingly routine behaviour in organizations frequently involves human beings making interpretations regarding the appropriate actions to be taken in a particular context. This is what has been referred to as 'negotiated order' (Day and Day, 1977), 'practical action' (Suchman, 1983, p. 321) or 'situated action' (Suchman, 1989). Such action, we have suggested, involves two levels of understanding: an understanding of specific actions that fit a particular instance of routine performance, and an understanding of the larger organizational context in which the routine is performed. The latter includes an understanding of tasks and perspectives of other organizational members, and an understanding of organizational characteristics such as organizational power and organizational identity.

Schein (1985) established that organizations maintain shared understandings regarding organizational values, priorities, and assumptions. Many other authors have linked such understandings with the accomplishment of organizational goals (Adler et al., 1999; March and Olsen, 1976, 1989; Quinn, 1991; Weick, 1995, pp. 65–9). A key part of our contribution is the argument that organizational routines create shared understandings through the connections that they make and that these shared understandings play a role in adaptation. In this section we will discuss the relationship between the different kinds of shared understandings we described in the previous section and the outcome of adaptability. We will also discuss how this relationship can help us understand how organizational routines can produce both stability and adaptability.

We have built our analysis on the observations that people performing organizational routines necessarily interact with other people. This essential fact requires from routine participants the ability to learn from and adapt to other people, and also establishes the reason that adaptation is necessary. In some of the examples we have used, adaptation is necessary because environmental factors change: the weather changes make landing an airplane more or less safe, and the number of homeless people changes, making it necessary for the NY Port Authority to be more or less engaged with this issue. But the examples also illustrate the need to adapt to the strengths and weaknesses of particular participants in the routines. Landing an aeroplane safely, for example, whether on land or on an aircraft carrier, depends on what information the pilots can receive and on the attention they can pay to that information. The other participants in the aeroplane landing routines need to be able to both understand what the pilot knows and does not know and to help him or her acquire whatever essential information is missing.

We have identified two kinds of understandings: understandings about what actions will be taken in a specific instance of a routine and understandings about why the routine is being performed or the purpose of the routine. The dynamics

of adaptation are different for the two kinds of understandings we have identified. Briefly, the '*what*' understandings affect the particular actions individuals take in the specific performance of a routine, while the '*why*' understandings affect the range of actions that routine participants believe are appropriate to consider taking. These two effects, while separable conceptually, are not separated in the performance of organizational routines. As the examples described above indicate, understandings about why people perform a routine and what actions they undertake while performing a routine are inter-related. Shared understandings about such things as power and identity can influence what individuals do as they go about performing various routines and what individuals do as they perform specific routines can influence the collectively held ideas about such things as power and identity. Before discussing the interaction of the two kinds of understandings, however, we first discuss the *what* and *why* understandings separately.

The *what* understandings are best exemplified by the flying and aircraft carrier examples where the connections made through the organizational routines help the people participating in the routine to adapt the performance so that it is appropriate in the particular situation. Adaptation is essential to performing the routine because the particulars of the situation change from one iteration of the routine to another. The connections provide the people engaged in the routine with information about how others are interpreting the situation and what actions they are taking.

The *why* understandings also affect the specific actions taken, but in a different way. The adaptations that make sense in specific routines will depend, in part, on the understandings that the individuals performing the routine have about the reasons for performing the routine. Thus, shared understandings about such things as the distribution of power and the organization's identity are important because they influence what actions are considered as options in performing a routine. As indicated in the example of the New York Port Authority understandings of the larger context in which the organizational routine is performed can affect what actions make sense in a particular instance of a type of routine.

The relationship between the *why* understandings and adaptation is complex for two reasons. One is that the shared understandings are not only created through the connections that organizational routines make but these understandings also constrain and enable the adaptations that are thinkable for future iterations of the same routine. Thus, actions taken in past hiring routines influence the actions that will be seen as appropriate in current and future hiring routines. But there is another complication as well. The larger context that constrains and enables hiring routines is not just constituted of past performances of hiring routines. This larger context is constituted of many different performances. Some of these performances are organizational routines and some of the organizational routines are hiring routines.

A hiring routine in a university setting, for example, both depends on and produces aspects of the organizational structure and culture, such as the distinction between faculty and staff, which is also produced through many other organizational performances. The distinction between faculty and staff, in turn, affects some of the adaptations to hiring routines and other organizational routines that are thinkable and workable as well as what a particular adaptation means. When hiring faculty members, for instance, staff members generally perform the back-

stage operations and faculty members make the final decisions. The boundary between these two is important, but grey areas abound. How much control over the advertising process should staff members have? How does the use of head-hunters influence the balance between support work and decision-making? How much screening can be done by staff members without becoming a major deter-minant of the final decision? In various circumstances, there may be pressure to increase the role staff members play. The thinkable or workable responses to these circumstances are influenced by shared understandings reproduced through the hiring routine as well as through other organizational performances.

One way to think about the ways in which *what* and *why* understandings differ is to locate their effects at different levels of conceptualization. We can conceptu-alize these levels as micro and macro, where micro refers to individuals and their interactions and macro refers to social structure and culture (Wiley, 1988, p. 255). Understandings about what actions need to be taken operate primarily at the micro level, influencing specific action and interactions in specific performances of a routine. Understandings about why actions need to be undertaken come from the macro level that consists of abstract understandings of the organizational structure and culture. Thus, we see that routines, like many other organizational phenomena, operate at both the micro and the macro levels (Rousseau, 1985; House et al., 1995). When we say that organizational routines operate at each of these levels, moreover, we are not just calling something that exists at different levels by the same name. We are also saying that the different levels influence one another or emerge from one another and, indeed, can be separated only theoret-ically (Wiley, 1988).

The mutual influence of the micro and macro levels with respect to organiza-tional routines is illustrated in Figure 2. The figure depicts two levels at which orga-nizational routines operate. The lower level is the micro level and consists of the specific, observable performance of a routine. This level refers to the actions and interactions involved in enacting a specific instance of routine. It affects and is affected by a macro level that consists of the understandings about organiza-tional structure and culture. Included in this macro level are the understandings about a type of routine, such as a hiring routine. Thus, the generalized or abstract hiring routine (or budgeting routine, or any other type of routine) is conceptual-ized here as part of the organizational structure or culture. The ideas that consti-tute this level can exist on paper or in the minds of people. This level, however, does not represent the observable performance of an organizational routine. Each of the aspects of organizations contained in the large box of Figure 2 influence the specific performance of a routine. A specific instance of hiring, for example, needs to have particular features both because it is a 'hiring routine' and also because we are a 'research university' or a 'high-tech firm' or a 'government organization'.

The interactions between the two levels are not one-sided, as indicated by the double-headed arrows. Indeed, the actions of individuals as they engage in specific performances of a routine create and re-create constructs of both types of routines and of the organizational structure and culture as a whole at the same time that these constructs constrain and enable the actions of individuals (Bourdieu, 1990; Giddens, 1984). The connections may overlap and the shared understandings may converge or conflict.
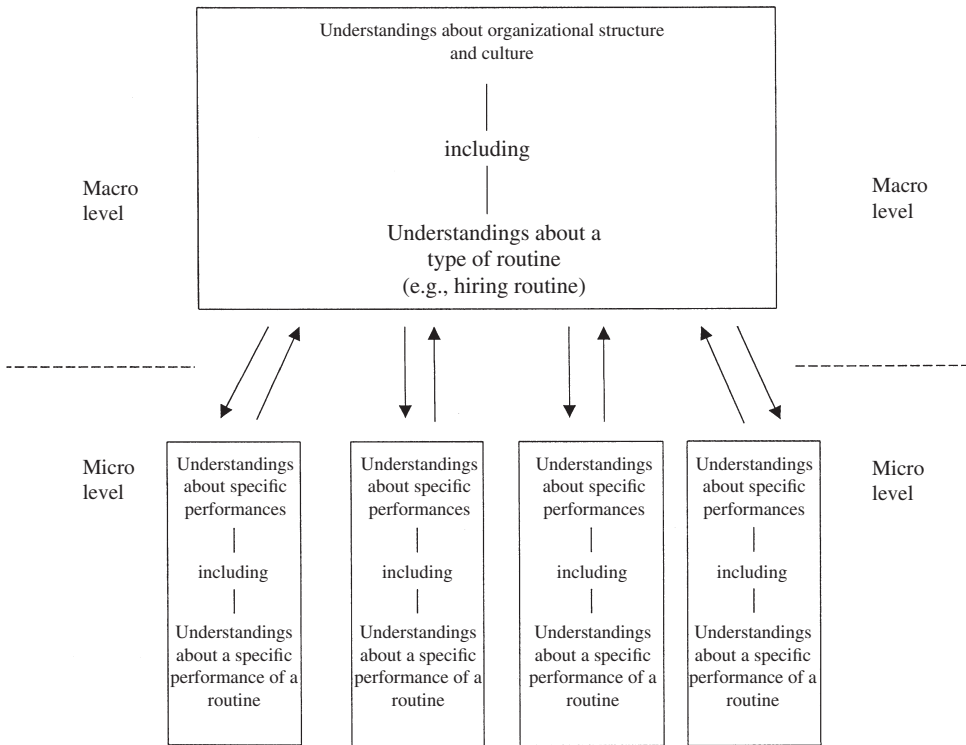
Figure 2. The macro- and micro-levels of organizational routines

Stability and Adaptability

Up to now we have focused on the effect that the connections organizational routines make and the shared understandings these connections help to generate have on the ability to adapt. As suggested in the introduction, however, part of what is interesting about organizational routines is that they also produce stability. In this subsection, we discuss how both connections and the understandings they generate affect this dual quality of organizational routines.

First, connections themselves can produce both stability *and* the ability to adapt. The metaphor of ballroom dance can help to illustrate what it means for connections to enable both stability and adaptability. In such dances individual actions are scripted, but not to the point of inflexibility. The dance specifies which connections will be made, when and how. Dancing requires adapting to the context (is there an object in the middle of the dance floor? are you going to bump into the other dancers?) and to variability in the behaviours of participants (is my partner near or far, on tempo or not?). The connection between the two bodies enables the dancers to communicate with one another and adjust to the context. The resulting behaviour will be similar in many ways but is unlikely to be repeated exactly. Some variations are likely because individuals need to adapt to other individuals to whom they are connected through the routine and to the context in which they perform the routine. Taking action in an organizational routine is very similar, though the connection is not usually direct bodily contact, but some other form of communication.

The connections that enable both stability and adaptability are not just between individuals but also among individuals in a collectivity. Again, the dance metaphor may be useful. In some dances (square dance comes to mind) not only does the routine involve performance of specific steps in conjunction with one's partner, but also the creation of a formation with multiple other dancers. Thus, in a square dance every pair of dancers also needs to be aware of what it means to create a square with six other dancers. All eight people in a square also need to be mindful of what it means to be one of many distinct squares occupying different locations on the dance floor. Similarly, organizational routines help to define the collectivity to which participants belong and this collectivity helps to define the actions that are appropriate both to maintain the collectivity and to adapt as appropriate when necessary.

The understandings that connections required by organizational routines make also help to influence both stability and adaptability. Here the dual quality of stability and adaptability is produced in part through the different affects of the micro- and macro-level understandings. Micro-level understandings need to change rapidly in order to adapt to the specific circumstances of each performance. The macro-level understandings are at a higher level of abstraction (Latour, 1986). They must be supported by and can, over time, be altered by actions at the micro level (Giddens, 1984; Weick, 1995). Because of the level of abstraction at which they operate, however, they change more slowly than the micro-level understandings developed in each instance of performing a routine. The macro understandings, therefore, are less adaptable to particular circumstances than those at the lower levels, and are more likely to appear to be stable. Conclusions about stability and adaptability, therefore, will depend on the level of observation. Researchers who observe specific performances of a routine will be more likely to observe adaptation than those who focus on ideas about a type of routine (Feldman and Pentland, 2000; Pentland and Rueter, 1994). As routines exist at multiple levels, however, they are both stable and adaptable at the same time.

IMPLICATIONS

Our analysis provides the basis for a new approach to thinking about organizational routines. The approach emphasizes the process of the routine as well as the outcome. While task related outcomes of routines are clearly important, they may vary from one iteration of the routine to another and different outcomes may be appropriate in different circumstances. The process of the routine, as represented by the relationship between connections and understandings, is important to whether the outcome can be adapted so that the outcomes are appropriate as circumstances change.

Moreover, in some cases routines may not contribute to the accomplishment of immediate tasks, but still create connections and shared understandings that are desirable. Connections and shared understandings are the central tenants of organizations. Without connections and shared understandings among individuals, organizations do not exist (Sandelands and Stablein, 1987; Simon, 1981; Weick, 1979, 1995). Our analysis suggests that organizational routines are one means through which such social alliances are formed. This suggests that time and effort

invested in an organizational routine may be well spent only because of the connections the routine generates.

Evaluations of organizational routines, therefore, should consider the connections a routine produces and the shared understandings these connections bring about in addition to the task outcomes of a routine. Evaluating a routine by the connections and shared understandings it produces may, however, require a shift in time frame. There may be a gap in time between the particular instance of a routine and the recognition of connections by participants or the development of shared understandings among participants. This may be why routines that do not lead to the accomplishment of immediate tasks are considered by participants to be a waste of time. Schwartzman (1989) makes this argument, for example, about meetings where many connections are made and shared understandings are developed, but few concrete goals are met.

Evaluation efforts that draw on the perspective we have developed should first consider who is connected through an organizational routine. Different connections can be brought about through different organizational routines and some of these connections may be more useful than others. A task performance focus would ask whether these are the appropriate people for accomplishing the work that needs to be done. A connections and shared understanding focus would ask whether a particular set of connections produces understandings that are useful for the organization and enables participants in routines to make appropriate adaptations to particular circumstances. In the public sector, for instance, managers need to connect to broad networks of individuals and groups whose work addresses the same sets of problems (Light, 1998; Roberts and King, 1996). The routines they have in place, however, often connect only people within the organizational boundaries. Such routines appear ineffective from our perspective.

Evaluating routines through the connections they make and whether the connections are useful for accomplishing the work of the organization can be particularly helpful when routines connect people who might not otherwise have opportunities to connect. People in different parts of organizations and in different organizations who require the support of one another do not always have connections to one another. But in many cases such people can benefit from a better sense of connection and better developed shared understandings.

For instance, police officers and prosecutors need to maintain shared understandings about how to maintain social order. Neither can bring about social order independent of the other group. Police officers need to produce legally valid reports in order for prosecutors to be effective in their work, and police officers rely on prosecutors to complete the job of keeping criminals off the streets. Routines that connect the two groups can help if they provide police officers and prosecutors with opportunities to develop shared understandings about the constraints of their work and about how they can work together to accomplish social order.

Thus, connections created by routines are not always among people who are formally employed by the same organization. Police officers and prosecutors, for example, are formally employees of different organizations. Routines that connect these two groups, however, may give members of both groups a sense of connection to each other, and a broader connection to the community of people who maintain social order. The evaluation of such routines should focus on the contribution of the routine to the maintenance of social order in addition to the specific tasks that the routine performs for the organization.

Another issue that needs to be considered is the medium of the connection. In many organizational routines the connections among people are primarily face to face, a medium that provides the strongest basis for the exchange of information (Daft and Lengel, 1986). Yet not all connections made by organizational routines are face to face. In fact, performances may be geographically and/or temporally distant. More and more connections may take place through electronic media that facilitate asynchronous communication (Sproull and Kiesler, 1991). Some authors illustrate how routines that rely on asynchronous connections can facilitate accomplishment of organizational goals (Rafaeli and Sudweeks, 1998). But others have suggested that synchronous meetings are essential to the creation of shared understandings (Sarbaugh-Thompson and Feldman, 1998; Schwartzman, 1989; Zack, 1993). The influence of the medium used to connect participants in organizational routines is an area for future research.

A third critical issue to be evaluated is the understandings generated through various connections. Some connections may provide shared understandings that enhance the ability to perform work for the organization while others may inhibit this ability (Gersick and Hackman, 1990; Janis, 1982; Staw and Ross, 1986). Analyses of military routines, for instance, reveal their potentially detrimental impact for transferring critical information (Wilensky, 1967, p. 44). Wohlstetter (1962) found that information about the impending bombing of Pearl Harbor was available to the US intelligence, but it did not get the appropriate attention because it did not flow according to the organizational routine. In this case the routines regulating information dissemination created a shared understanding that only channels of communication that maintain the power hierarchy are legitimate. This shared understanding prevented participants from attending to important information and taking appropriate action. The connections in this case did not bring about shared understandings that were helpful in this particular and critical instance.

Routines are often thought to increase control by management in organizations (March and Simon, 1958; Stinchcombe, 1990). But the effort to control comes at a price. It may reduce the adaptability essential to performing organizational tasks (Merton, 1940). The example of the inability to make critical information known to the people who could do something about it illustrates the downside of such control efforts and the importance of connections and shared understandings that promote a balance between stability and adaptability. What understandings have the desired quality and what connections help to produce them is a question for future research.

CONCLUSION

The perception of organizational routines as enabling both stability and change is integral to our analysis. It was our point of departure and our analysis explains how this seeming contradiction can be. The blend of adaptive and scripted behaviour has been hinted at in previous work on organizational routines (Cyert and March, 1963; Nelson and Winter, 1982; Pentland and Rueter, 1994), but it has not been developed. What our analysis contributes is the understanding that the *connections* that organizational routines make between people performing the routine constitute a mechanism that enables routines to accomplish both.

In short, variations in behaviour, even when organizational routines prescribe specific behaviours are inevitable. As the dance metaphor suggests, individual behaviours constructing a routine cannot be expected to be identical every time. But they can be expected to conform to a typified pattern. The connections that routines make and the resulting understandings about both what needs to be done to perform a routine and why the routine needs to be performed help people performing the routine accommodate both the specific variations and the abstract understandings. Consequently, routines are both the building blocks of stability and also the foundation of adaptation. Because routines and the understandings that affect them exist at both the micro and the macro level they can prescribe scripted behaviours, but also allow the show to go on by facilitating adaptation.

NOTES

*Portions of this work were done while Anat Rafaeli was at the University of Michigan. Because the paper is an equal collaboration, order of authorship is alphabetical.
[1] One could also extend the connections made by the routine to include the people who create the physical objects that help the other people calculate and remember the appropriate speeds.

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