

## NOTE

# THE EVOLUTION OF SOCIAL STRUCTURE: WHY BIOLOGY MATTERS

BARBARA DECKER PIERCE

RODERICK WHITE

Richard Ivey School of Business

Sociobiologists and evolutionary psychologists believe that much about behavior has deep evolutionary roots. We employ this emerging paradigm about the origins of human nature to explain social behavior and emergent social structures. Using the work of socioecologists and ethologists, we connect these social structures with features of the resource context. Although still controversial, using biological evolution to help explain (social) behaviors holds significant potential for advancing the organizational sciences.

Why are certain patterns of social behavior exhibited within organizations and organizational workgroups? Even more fundamentally, what drives behavior in social situations? To understand the deep roots of emergent behavior, evolutionary psychologists have departed from traditional assumptions about rationality, goal directedness, utilitarianism, and cultural determinism and have developed a radically different view of human nature (Barkow, Cosmides, & Tooby, 1992; Buss & Malamuth, 1996; Cosmides & Tooby, 1987; Lumsden & Wilson, 1981; Pinker, 1997). In their view the human mind is neither a blank slate nor a general-purpose computer programmed by our parents, our schools, and our culture. Instead, members of our species are born with a large repertoire of genetically encoded psychological mechanisms, which are the foundation of human behavioral responses. Psychological mechanisms are not preprogrammed behaviors; rather, they are information-processing programs that are activated by perceptions of our environment. Much of hu-

man behavior, including social behavior, is the outcome of the interplay between perceived environmental cues and innate psychological mechanisms (Studd, 1996; Wright, 1994).

Psychological mechanisms have their origins deep in the shadows of our ancestral past (Sagan & Druyan, 1992). Evolutionary psychologists Leda Cosmides and John Tooby note that "our ancestors have been members of social groups and engaged in social interaction for millions and probably tens of millions of years" (1992: 163). This observation leads them to conclude that humans have "a rich collection of dedicated, functionally specialized interrelated modules (i.e. . . . mechanisms) organized to collectively guide thought and behavior with respect to the evolutionarily recurrent adaptive problems posed by the social world" (1992: 163). Thus, many of our psychological mechanisms are adaptations to problems inherent in the social nature of our species. Generations of natural selection have produced robust solutions to these problems and encoded them into our genetic makeup. Through the process of natural selection, psychological mechanisms that solved the survival problems of our hunter/forager ancestors have become genetically encoded and continue to influence the social behavior of our species in contemporary settings.

Because of the nature and number of problems presented in the environment, evolved psy-

---

The Social Sciences and Humanities Research Council of the Government of Canada and the Plan for Excellence of the Richard Ivey School of Business generously supported the writing of this article. We thank Eric Abrahamson, Chris Argyris, Pratima Bansal, Michael Hitt, David Hurst, William Mitchell, Nigel Nicholson, Margaret Power, Andrew Van de Ven, and three anonymous reviewers for their helpful comments. We extend special thanks to Michael Chance for his continued encouragement and support.

chological mechanisms are likely to be large in number and complex in nature. Many will be domain specific—that is, tailored to solve specific problems and activated only when certain cues are perceived. Buss (1990) maintains that it is the number and specific nature of psychological mechanisms that confer a behavioral flexibility on our species. "It is the numerousness and specificity of the tools in the entire tool kit that give the carpenter great flexibility, not a highly 'plastic' single tool" (Buss, 1990: 270).

It is well accepted that the process of natural selection resulted in the development of certain physiological adaptations. But selection pressures also exist for psychological (and social-psychological) attributes (Wilson, 1975). Both the physical and psychological adaptations of our ancestors enhanced the survival of our species (Daly & Wilson, 1996).

Recently, Nicholson (1997, 1998) challenged organizational researchers and managers to give evolutionary psychology serious consideration in their studies of organizational life. However, with few exceptions (in genetics: Arvey & Bouchard, 1994, and Arvey, Bouchard, Segal, & Abraham, 1989; and in sociobiology: Glassman, 1984), management researchers have not considered evolution as anything more than a metaphor (Morgan, 1997; Nelson, 1995). Looking back to ancestral forms of social organization to understand and improve management practice has generated some interest (Hurst, 1991; Jay, 1972; Nicholson, 1997, 1998) but produced little theoretical work and, to our knowledge, almost no empirical investigation in the organization sciences.

Our intent here is to draw upon the theory of evolutionary psychology to help develop organizational theory. Specifically, we employ and extend evolutionary theory to explain the origins of organizational social structure. Reinterpretation of Burns and Stalker's (1961) classic organizational ethnography suggests that these social structures provide an important part of the foundation upon which modern human organizations are built. We discuss the implications of a theory about the origins of social structure based upon evolutionary psychology and consider some of the controversies surrounding evolutionary theories.

## CONNECTING EVOLUTION WITH SOCIAL STRUCTURE

Humans are not aware of the influence biological evolution exerts on their cognition and actions (Wright, 1994). Consequently, understanding the influence of our ancestral past on current organizational realities will not come about purely by immersion in the contemporary phenomenon—that is, social behaviors within modern organizations. If, as Wright maintains, the connection between our adaptive psychological mechanisms and contemporary environments is "opaque to introspection" (1994: 10), where can we look for insight? Buss encourages us to seek "knowledge of different cultures, including contemporary hunter-gather cultures, and knowledge of other species for comparative analysis" (1990: 283). Wilson also suggests that the genetic influence on human social behaviors can best be evaluated "by comparison with the behavior of other species and then, with greater difficulty and ambiguity, by studies of variation among and within human populations" (1978: 20). Going beyond "species-centric" research has the potential of revealing much to those interested in fundamental theories of human behavior.

Previous researchers have found it helpful to look for clues about the social behavior of prehistory humankind in the present-day behavior of our closest evolutionary relatives: the nonhuman primates (Lenski, 1975; Loy & Peters, 1991). Nonhuman primates live in environmental conditions similar to those of our human ancestors; they function in social groupings, and they are our closest genetic relatives. Consequently, the study of chimpanzees and other nonhuman primates may be able to inform us about the social behavior of prehistoric human groups.

### A Chimpanzee Puzzle

One finds a crucial theoretical insight about the nature of primate social interactions in the work of anthropologist Margaret Power (1988, 1991). Power was intrigued by inconsistent findings reported by ethologists during the 1960s and 1970s concerning the social behavior of chimpanzee groups. Early research described gregarious animals exhibiting natural curiosity about each other and their surroundings (Goodall, 1963, 1965; Nishida, 1968; Sugiyama, 1968). Highly social in nature, these groups appeared

loosely bonded, with little conflict or antagonism between members. In later research some of these same researchers observed very different behaviors: strict dominance hierarchies with aggressive and outwardly hostile social behavior (Goodall, 1979; Goodall et al., 1979; Nishida, 1979). Rather than reporting peaceful groups of nonaggressive chimpanzees, these researchers reported chimpanzee behavior that was directly competitive and fiercely territorial (Power, 1988).

The difference, Power suggests, resulted from human intervention. Early researchers had attempted to observe chimpanzees in their natural state, but naturalistic methods of field study proved to be difficult and costly owing to the chimpanzees' densely forested habitat and small group foraging behavior. To make things easier, some researchers changed their study methodology from naturalistic observation to artificial provisioning. They supplied food to the chimpanzees at central feeding sites. Provisioning was very effective at bringing the animals to the researchers. However, provisioned chimpanzees no longer needed to forage for food. Instead, they came together waiting for food to be made available to them. Once the food arrived, competition was immediate and direct. Competition then intensified as there were frequently more animals waiting than food available to feed them. Power suggested that provisioning created the conditions for direct competition, thereby altering patterns of social interaction. She believed altering the resource context altered emergent social behaviors. For a way to describe these different patterns, Power turned to the work of British ethologist Michael Chance.

### Agonic and Hedonic Social Structures

Chance (1956, 1963) observed and studied the social behavior of various species of nonhuman primates during a 15-year period. He concluded that monkeys and apes live in small heterogeneous (mixed-gender, intergenerational) groups displaying highly structured and stable social relationships. In his work he identified two predominant patterns or modes of social structure that he termed *agonic* and *hedonic* (Chance & Jolly, 1970). These two modes of social structure are summarized in Table 1.

**Agonic mode.** Agonic groups form stable troops of dominant and submissive members that travel together. Those who attain and maintain dominance do so through overt acts and displays of aggression. At the slightest provocation, less dominant members are ready to perform acts of submission to ward off attack. Submissive members never stray far from dominants to ensure a full view of their actions, but they also maintain a respectful distance to keep out of harm's way. Because of the possibility of attack from within, most members of the troop keep their attention focused on dominant animals and, consequently, are highly aroused. They show little curiosity about others or their physical surroundings. When external danger threatens, they cluster together and look to the dominants for protection.

**Hedonic mode.** Members of hedonic groups exhibit behavior that is much more variable and flexible. Unlike animals in agonic troops, members of hedonic groups do not need to be in constant view of each other. They split into

**TABLE 1**  
**Features of Agonic and Hedonic Social Structures**

| Feature                          | Agonic  | Hedonic  |
|----------------------------------|---|--|
| 1. Social cohesion and attention | Continuous (single troop)   | Periodic (fission/fusion)                              |
| 2. Attention to a central figure | To modulate threat and avoid attack (dominance/positional leader) | In response to display (prominence/situational leader) |
| 3. Continuous attention          | Confined within the society                                       | Capable of being directed at physical environment      |
| 4. Arrangement of individuals    | Spatially separated (respectful distance) (dyads)                 | Close contact (hugging/touching) (networks)            |
| 5. Social relations              | Balanced; successful avoidance of punishment                      | Rewarded (mothering/sharing)                           |
| 6. Arousal                       | Continuous (medium to high)                                       | Fluctuating (low to medium)                            |

small foraging groups with a shifting composition in a pattern of periodic separation and cohesion referred to as *fission/fusion*. When reunited, the atmosphere is so festive that Reynolds (1965) compares it to that of a "carnival."

Rank within the group is not rigidly determined. Individuals compete for the attention of other group members through display behaviors and mutual grooming. Since social solicitation replaces intimidation, prominence—not dominance—determines leadership. Members of hedonic groups interact attentively with their environment. They are not highly aroused in these low-status differential groups. When danger threatens, the group gathers together, "making body contact, slapping and hugging each other . . . The group is not the source of common defense as in the agonistic mode, but a source of mutual confidence" (Chance, 1980: 89).

Although Chance initially believed social structure to be an inherited characteristic of a species, Power noted the manifestation of both modes—hedonic and agonistic—within one species: chimpanzees. The mode of social structure depended upon their resource context. Why would social structure have a contingent relationship with the resource context? The biological branch of socioevolutionary theory provides an explanation.

### An Evolutionary Explanation

The work of ethologists is helpful in identifying patterns of social behavior, but it is less helpful in providing theoretical explanations for these observations. Why would different types of resource context lead to the emergence of different modes of social structure? For an explanation we turn to the work of evolutionary psychologists and to the adaptive problems of group formation and cohesion present in our ancestral environment.

From a survival standpoint, group formation is desirable (Barchas, 1986; Baumeister & Leary, 1995). Individuals functioning within groups are less susceptible to predation and can take advantage of cooperative opportunities (Alexander, 1974). In this view, a sense of belonging has its origin in the survival advantage of group membership. Individuals with positive feelings about belonging are more likely to join a group and, accordingly, more likely to survive and

pass on this "belongingness" trait to their offspring. However, belonging to a group has potential disadvantages. Individuals compete most directly with members of their own species for the resources necessary for survival and reproductive success. Group membership makes these resources more contestable. But not all resource contexts are equally contestable.

**Contestability.** When food is supplied at central feeding sites, individuals seeking resources are drawn together. This configuration of resources makes them *contestable*. Group members compete for the same resources. Although many aspects of group functioning enhance individual survival, fighting for resources among group members, with the likelihood of injury or death, reduces it. Groups functioning in contestable resource contexts benefit from a social structure that ameliorates destructive within-species competition. The agonistic mode establishes hierarchical procedures for resource allocation among group members, thereby limiting destructive conflict. The adaptive problem of group maintenance within contestable resource contexts has been resolved by the evolution of the agonistic mode of social interaction.

**Cohesion.** When food resources are dispersed throughout densely forested habitats, it is advantageous for individuals to scatter out and forage for what they need. However, foraging draws individuals apart and, in so doing, hampers group cohesion. In order to benefit from the survival advantages inherent in group membership, group members must balance a resource context that separates individuals with a social structure that brings them together. In the hedonic social structure members engage in interpersonal bonding activities, such as greeting, sharing, and close physical contact, thereby fostering group affiliation. These rich forms of social interaction evoke positive feelings, increasing the likelihood that even when individuals are separated by resource acquisition activities, they will return to their group on a regular basis.

Different resource contexts require different resource acquisition tactics. In turn, these acquisition tactics (competition or foraging) create different problems for social groupings. In both cases, however, social structure provides a solution to the adaptive problem of group formation and sustained cohesion. This specific theory falls within the broader realm of socio-

evolutionary theory. It applies in situations of resource scarcity. If resources are abundant and readily available, the problems created by resource acquisition tactics—that is, competition and foraging—are not experienced by the group. Indeed, an abundance of resources implies an absence of natural selection pressures. Consequently, socioevolutionary theory does not address this circumstance.

Thus, highly contestable resource contexts trigger agonistic social structures; contexts where resources are not as contestable evoke the hedonic mode. Evolutionary psychology suggests that these solutions are deeply embedded in psychological mechanisms triggered by perceptions of the resource context. For a fuller understanding of the relevant dimensions of the resource context and their relationship to contestability, we turn to the work of socioecologists.

### Resource Context

Socioecologists study environmental conditions influencing behavior and social organization (Gartlan, 1968; Ghiglieri, 1984; Smuts, Cheney, Seyfarth, Wrangham, & Struhsaker, 1987). For ecologists the salient features of the environment are those resources needed for survival and reproductive success: food, water, and mating opportunities. When specific aspects of a group's resource context are identified and isolated, predictable patterns of social behavior emerge. The socioecological literature identifies four characteristics of the resource context that are consistently linked to social behavior. We discuss these below.

**Distribution.** Resources can be scattered throughout a territory or clustered in clumps. Southwick (1967) and, later, Boccia, Laudenslager, and Reite (1988) found that clumping resources leads to increased aggressive behavior in macaque monkeys. Like Margaret Power, Sugiyama and Ohsawa (1982) concluded that the clumping that occurred when the chimpanzees were provisioned increased direct competition for resources and led to increased agonistic behavior. Mitchell, Boinski, and van Schaik (1991) studied two closely related species of squirrel monkey that lived in different habitats. They found that monkeys living in resource contexts where the food existed in defensible clumps exhibited strong hierarchical domi-

nance (agonistic) behavior, whereas those residing in contexts with scattered resources displayed weaker dominance relationships.

**Visibility.** Some resource fields, such as savanna, are open, allowing animals in a troop to see available resources and to observe each other. Other habitats, such as forests, are lush and overgrown, preventing easy observation. In open grasslands animals are keenly aware of their troopmates, watching to see what resources others encounter. High visibility in the savanna environment encourages competitive behavior, allowing dominant members to challenge others for access to prized food items. In forest settings, however, the density of cover allows animals to forage without concern that others might challenge for food items (Rowell, 1966).

**Predictability.** Within certain habitats resources can be located in predictable locations or at predictable times of the day or year. In other resource conditions there is no way to determine beforehand where resources might be located or when they might be available. When resources are predictable, monkeys forage together in large groups with agonistic social behaviors. If, however, either the location or timing of resource availability is unpredictable, monkeys scatter and forage in small groups or, in some cases, on their own. When they come together, their social behaviors are hedonic (Denham, 1971).

**Timing.** Animals generally consume resources immediately. However, the consumption of acquired resources may be delayed until some future time. Delaying consumption makes the resource more susceptible to contestation. The distinction between immediate return (or consumption) and delayed return was a crucial difference for Woodburn (1982) in his investigations of human egalitarian societies. He found that societies having economies based on immediate rather than delayed return were assertively egalitarian. Woodburn's egalitarian societies have much in common with hedonic social structures.

Considering the work of Power and Chance and the literature of socioecology, we can associate the two modes of social structure with specific aspects of the resource context. We summarize this relationship in Table 2.

**TABLE 2**  
**The Relationship Between Resource Context and Contestability**

| Resource Context            | Contestability                   |                                    |
|-----------------------------|----------------------------------|------------------------------------|
|                             | High                             | Low                                |
| Distribution <sup>a</sup>   | Clustered/focused                | Scattered/dispersed                |
| Visibility <sup>b</sup>     | High                             | Low                                |
| Predictability <sup>c</sup> | High                             | Low                                |
| Timing <sup>d</sup>         | Delayed consumption <sup>e</sup> | Immediate consumption <sup>e</sup> |
| Emergent Social Structure   | Agonic                           | Hedonic                            |

<sup>a</sup> Boccia, Laudenslager, & Reite (1988); Mitchell, Boinski, & van Schaik (1991); Southwick (1967); Sugiyama & Ohsawa (1982).

<sup>b</sup> Rowell (1966).

<sup>c</sup> Denham (1971).

<sup>d</sup> Woodburn (1982).

<sup>e</sup> Woodburn (1982) studied human societies and used the terms *delayed return* and *immediate return*. For nonhuman primates it is consumption that is delayed.

### Evolutionary Debates

The basic proposition that evolution has influenced human psychology and thereby human behavior is controversial (Dennett, 1995). It raises many fundamental and ongoing debates. Here we consider the nature versus nurture debate and the associated free will versus determinism debate.

Evolutionary psychology is founded on the construct of heritable psychological mechanisms. But its supporters do not argue for strict biological determinism. Although psychological mechanisms are innate and invariant, they are not specific behaviors. The evolutionary invariant is at the level of psychological mechanism—not at the level of manifest behavior (Cosmides & Tooby, 1987). We are not preprogrammed. As Symons points out, "Human behavior is uniquely flexible. . . . Our flexibility of means and our inflexibility of ends are underpinned by an array of psychological mechanisms that is universal among *Homo Sapiens* . . . and finite" (1992: 139). This large and flexible repertoire of behaviors allows for considerable latitude and, thus, the exercise of "free will."

If behaviors are flexible and not fully determined by our biological heritage, then at least some behaviors may be learned. How much of human behavior is learned versus how much is biologically determined forms the essence of the nature versus nurture debate. Increasingly, theorists accept that nature predisposes humans to act and interact in particular ways in particular cir-

cumstances, although as Dawkins, author of *The Selfish Gene*, recognizes, "We, alone on earth, can rebel against the tyranny of the selfish replicators" (1976: 215). But no rebellion can completely sever relationships with the past. That which goes before influences that which comes afterward. And our genes, given their slow rate of change, cast a long shadow into our future.

Instead of nature versus nurture or free will versus determinism, it is more helpful to think about nature and nurture, free will and determinism. Psychological mechanisms provide the evolutionary foundation upon which our socially constructed world of cultures (and organizations) has been built (Berger & Luckman, 1966). The rules and conventions of social interaction can be structured in many different and elaborate ways, and they can change and develop over time. However, just as the foundation of a building is connected to the structure that is erected upon it, so too are social (and cultural) conventions linked to a biological base (Dennett, 1995). Our early forms of social organization grew out of a simpler set of biologically based protobehaviors. Our cultures and organizations are built upon these earlier forms of social organization and are still attached, however indirectly, to this evolutionary foundation.

### IMPLICATIONS FOR ORGANIZING HUMANS

Do human groups exhibit the patterns of social structure suggested by socioevolutionary

theory? Woodburn's (1982) work indicates that when resources are scattered, unpredictable, and consumed immediately, hunter/gatherer communities interact in ways consistent with the hedonic mode. Hurst (1991) as well has identified that when hunter/gatherers became settled farmers and herders, with concentrated, predictable resources requiring delayed consumption, agonistic social behaviors emerged. There is some evidence that the hypothesized relationships hold for traditional human societies, but is the same true for modern organizations?

On the face of it, modern human organizations seem very different from monkey troops, or even early hunter/gatherer communities. The evolution of human society and its organizations has added much complexity to our existence. But do these layers of complexity fundamentally alter our innate predispositions, or do they just make them harder to observe and interpret? If social behaviors are molded by evolution, they should be manifest within modern organizations. Also, in previous ethnographic studies of organizations, such as the seminal work of Burns and Stalker (1961), researchers, although not using this theoretical lens, should have detected the anticipated patterns of behavior.

There are strong parallels between the mechanistic and organic systems of management practice identified by Burns and Stalker and the agonistic and hedonic social structures of socioevolutionary theory. Like agonistic monkey troops, *mechanistic* human organizations are hierarchical in nature, with control, authority, and communication dependent on position/rank. Superiors are dominant and expect subordinates to follow direction submissively. Attention is focused inwardly on the nature of the task, with "greater importance and prestige attaching to internal (local) than to general (cosmopolitan) knowledge, experience and skill" (Burns & Stalker, 1961: 120). Daily interaction and communication are based on position—normally occurring between superior and subordinate.

In *organic* (hedonic) systems employees are stratified, but their relationships are nonhierarchical. Authority flows from competence and prominence, often varying with the task at hand. "The lead in joint discussions is frequently taken by seniors, but it is an essential presumption of the organic system that the lead, i.e. 'authority', is taken by whomever shows himself

most informed and capable" (Burns & Stalker, 1961: 122) There is also greater contact with those outside the organization. Communications occur within a network of personal contacts both inside and outside the organization.

Although the similarities between agonistic/hedonic modes and mechanistic/organic systems are evident, the corresponding parallel between socioevolutionary theory's resource context and Burns and Stalker's conceptualization of the environment is less obvious. This is not surprising because Burns and Stalker identified, *ex post*, their dimension of the environment—that is, "rate of change," which they associated with the observed differences in management systems. Since, initially, they did not perceive a role for the environment, Burns and Stalker did not describe it in much detail. However, they did provide descriptive evidence that supports a resource context—social structure connection. For example, in organic R&D units the vital resource of information was widely scattered inside and outside the organization. Scientists and technicians "foraged" to acquire the resources they needed. Alternatively, the resources needed by mechanistic manufacturing departments—primarily capital and labor—were centrally controlled and accessible only through intraorganizational competition in the firm's capital allocation process.

The rate of change in the environment—the independent variable in Burns and Stalker's model—may be correlated with dimensions of resource context. Stable environments tend to generate stable income flows, making internal resources readily available, as well as highly predictable and visible. High-change environments, however, decrease the predictability of income flows. Stable and highly predictable resource contexts support mechanistic (agonistic) systems, whereas variable, low-predictable resource contexts lead to organic (hedonic) systems. The observations made by Burns and Stalker are consistent with the relationship between resource context and emergent social structure predicted by socioevolutionary theory.

Burns and Stalker's work has been developed, both theoretically (Galbraith, 1973; Thompson, 1967) and empirically (Lawrence & Lorsch, 1967), into what has come to be called "contingency theory." Accepted contingency theory, specifically, and much of organizational theory, more generally, deal with the formal, designed aspect

of an organization's structure. Socioevolutionary theory speaks to the informal, emergent social structure and suggests that managers cannot design social structures (although by changing perceptions of the resource context, different social structures can be evoked).

Established firms have both emergent social structures and designed organizational structures. These may exist in harmony and concordance with one another, or they may not.

### MANAGING THE MODERN FIRM

The relationship of an organization with its environment is much studied. Institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977), population ecology (Hannan & Freeman, 1977, 1989), and resource dependency (Pfeffer & Salancik, 1978) join contingency theory as influential attempts to explain how certain features of an organization's structure fit with its environment. For much existing organization theory, structure is a macrolevel concept that can be designed and managed directly. For example, in order to deal with environmental variability or uncertainty, managers can require certain types of relationships (differentiation) and patterns of interaction (integration) among members of organizational workgroups. Formal organizational structures are constructed artifacts. Socioevolutionary theory takes a different, but not necessarily contradictory, perspective.

Emergent social structure roughly corresponds to what is often called the "informal organization" (Roethlisberger & Dickson, 1939). Supporters of socioevolutionary theory contend that inherited psychological mechanisms are the major determinant of social structure (i.e., the informal organization). Managers may be aware of our inherited predispositions, but they cannot affect them directly. Yet this new field of inquiry suggests that managers can influence social structure outcomes by configuring the internal context of their organization and affecting the perceptions of the external context. For example, an organization's internal resource allocation processes (e.g., capital and operating budget procedures) are formal, designed aspects of the organization, but they are also part of the resource context perceived by the members of that organization. If these formal processes cluster and concentrate the distribution

of resources, are highly visible and predictable, and have significant delays between the acquisition and use (or consumption) of the resources, then socioevolutionary theory predicts an agonic social structure.

Conversely, managers may wish to create the perception that members of the organization can forage broadly for the resources they need. Jack Welch, CEO of General Electric, has promoted the idea of "boundarylessness" (Tichy & Sherman, 1993). This expanded perception of the relevant resource context may encourage foraging behaviors and result in a more hedonic-like social structure. By affecting employees' perceptions of their resource context, managers can influence the emergent social structure within their organization.

This theory has implications for organizations experimenting with new organizational forms to improve performance (Banker, Field, Schroeder, & Sinha, 1996; Katzenbach & Smith, 1993; Larson & LaFasto, 1989). For example, management may want employees to work in egalitarian teams. Socioevolutionary theory suggests that unless resources are perceived to be dispersed, and foraging, not competition, determines access, members will continue to behave as if they were functioning within a hierarchical structure. This may explain why so many organizations are experiencing difficulty deriving the expected benefits of team-based initiatives. Managers can design and attempt to implement new organizational forms, but if they do not adjust the resource context to support the desired mode of social relationships, then strong behavioral predispositions will reduce their effectiveness. Socioevolutionary theory suggests that formal organizational structures need to be built upon complementary informal social structures, and these have their origin in deeply ingrained, evolutionarily established social behaviors.

### CONCLUSION

The theory we have developed here maintains that humankind has evolved different forms of social structure in response to the survival challenges present in our ancestral environment. These responses have been encoded into the genetic makeup of our species as domain-specific, psychological mechanisms. Social be-

haviors and emergent social structure are not simply economically or administratively rational. Given our biological history, behaviors also have an evolutionary rationale (Frank, 1988). Even more fundamentally, managers with the understanding that human behavior is shaped by evolutionary influences can achieve desired organizational outcomes by cultivating a context consistent with the natural inclinations that influence human social action.

In this work we have introduced disciplines new to most organizational theorists. We have employed the fields of evolutionary psychology, comparative ethology, and socioecology to derive a theoretical explanation for the emergence of specific forms of social structure in organizations. Wilson foresaw great potential in this type of synthesis when he stated,

By a judicious extension of the methods and ideas of neurobiology, ethology and sociobiology a proper foundation can be laid for the social sciences and the discontinuity still separating the natural sciences on the one side and the social sciences and humanities on the other might be erased (1978: 195).

The work of evolutionary psychologists notwithstanding, progress toward integrating the organization sciences into this grand synthesis has been limited. This note illustrates how bringing socioevolutionary thinking to organizational theorizing can make such connections. The potential implications for both organizational sciences and management practice are considerable.

## REFERENCES

- Alexander, R. D. 1974. The evolution of social behavior. *Annual Review of Ecology and Systematics*, 5: 325-383.
- Arvey, R. D., & Bouchard, T. L. 1994. Genetics, twins and organizational behavior. *Research in Organizational Behavior*, 16: 47-82.
- Arvey, R. D., Bouchard, T. L., Segal, N. L., & Abraham, L. M. 1989. Job satisfaction: Environment and genetic components. *Journal of Applied Psychology*, 74: 187-192.
- Banker, R. D., Field, J. M., Schroeder, R. G., & Sinha, K. K. 1996. Impact of work teams on manufacturing performance: A longitudinal study. *Academy of Management Journal*, 39: 867-890.
- Barchas, P. 1986. A sociophysiological orientation to small groups. In E. Lawler (Ed.), *Advances in group processes*, vol. 3: 209-246. Greenwich, CT: JAI Press.
- Barkow, J. H., Cosmides, L., & Tooby, J. (Eds.). 1992. *The adapted mind*. New York: Oxford University Press.
- Baumeister, R. F., & Leary, M. R. 1995. The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117: 497-529.
- Berger, P. L., & Luckman, T. 1966. *The social construction of reality*. New York: Doubleday.
- Boccia, M. L., Laudenslager, M., & Reite, M. 1988. Food distribution, dominance and aggressive behaviors in bonnet macaques. *American Journal of Primatology*, 16: 123-130.
- Burns, T., & Stalker, G. M. 1961. *The management of innovation*. London: Tavistock.
- Buss, D. M. 1990. Evolutionary social psychology: Prospects and pitfalls. *Motivation and Emotion*, 14: 265-286.
- Buss, D. M., & Malamuth, N. M. (Eds.). 1996. *Sex, power, control: Evolutionary and feminist perspectives*. New York: Oxford University Press.
- Chance, M. R. A. 1956. The social structure of a colony of *Macaca mulatta*. *British Journal of Animal Behavior*, 4: 1-13.
- Chance, M. R. A. 1963. The social bond of the primates. *Primates*, 4(4): 1-22.
- Chance, M. R. A. 1980. An ethological assessment of emotion. In R. Plutnick & H. Kellerman (Eds.), *Emotion: Theory, research and experience*: 81-111. New York: Academic Press.
- Chance, M. R. A., & Jolly, C. J. 1970. *Social groups of monkeys, apes and man*. London: Jonathan Cape.
- Cosmides, L., & Tooby, J. 1987. From evolution to behavior: Evolutionary psychology as a missing link. In J. Dupre (Ed.), *The latest and best essays on evolution and optimality*: 277-306. Cambridge, MA: MIT Press.
- Cosmides, L., & Tooby, J. 1992. Cognitive adaptations for social exchange. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture*: 163-227. New York: Oxford University Press.
- Daly, M., & Wilson, M. 1996. Evolutionary psychology and marital conflict: The relevance of stepchildren. In D. M. Buss & N. M. Malamuth (Eds.), *Power, sex, conflict: Evolutionary and feminist perspectives*: 9-28. New York: Oxford University Press.
- Dawkins, R. 1976. *The selfish gene*. Oxford, England: Oxford University Press.
- Denham, W. W. 1971. Energy relations and some basic properties of primate social organization. *American Anthropologist*, 73: 77-95.
- Dennett, D. C. 1995. *Darwin's dangerous idea*. New York: Touchstone.
- DiMaggio, P., & Powell, W. W. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48: 147-160.
- Frank, R. H. 1988. *Passions within reason*. New York: Norton.
- Galbraith, J. 1973. *Designing complex organizations*. Reading, MA: Addison-Wesley.

- Gartlan, J. S. 1968. Structure and function in primate society. *Folia Primatologica*, 8: 89-120.
- Ghiglieri, M. P. 1984. *The chimpanzees of Kibale Forest*. New York: Columbia University Press.
- Glassman, R. B. 1984. A sociobiological examination of management theory. *Human Relations*, 37: 367-395.
- Goodall, J. 1963. My life among wild chimpanzees. *National Geographic*, 128: 802-808.
- Goodall, J. 1965. Chimpanzees of the Gombe Stream Reserve. In I. DeVore (Ed.), *Primate behavior*: 425-473. New York: Holt, Rinehart & Winston.
- Goodall, J. 1979. Life and death at Gombe. *National Geographic*, 155: 592-621.
- Goodall, J., Bandora, A., Bergman, E., Busse, C., Matama, H., Mpongo, E., Pierce, A., & Riss, D. 1979. Intercommunity interactions in the chimpanzee population of the Gombe National Park. In D. A. Hamburg & E. R. McGowan (Eds.), *The great apes*: 13-53. Menlo Park, CA: Benjamin/Cummings.
- Hannan, M. T., & Freeman, J. H. 1977. The population ecology of organizations. *American Journal of Sociology*, 82: 929-964.
- Hannan, M. T., & Freeman, J. H. 1989. *Organizational ecology*. Cambridge, MA: Harvard University Press.
- Hurst, D. K. 1991. Cautionary tales from the Kalahari: How hunters become herders (and may have trouble changing back again). *Academy of Management Executive*, 5(3): 74-86.
- Jay, A. 1972. *Corporation man*. London: Cape.
- Katzenbach, J. R., & Smith, D. K. 1993. *The wisdom of teams: Creating high performance organizations*. Cambridge, MA: Harvard University Press.
- Larson, C. E., & LaFasto, F. M. J. 1989. *Teamwork: What must go right, what can go wrong*. Newbury Park, CA: Sage.
- Lawrence, P. R., & Lorsch, J. W. 1967. *Organizations and environment: Managing differentiation and integration*. Boston: Harvard University School of Business Administration.
- Lenski, G. 1975. Social structure in evolutionary perspective. In P. M. Blau (Ed.), *Approaches to the study of social structure*: 135-153. New York: Free Press.
- Loy, J. D., & Peters, C. B. 1991. *Understanding behavior: What primate studies tell us about human behavior*. New York: Oxford University Press.
- Lumsden, C. J., & Wilson, E. O. 1981. *Genes, mind and culture*. Cambridge MA: Harvard University Press.
- Meyer, J., & Rowan, B. 1977. Institutionalized organizations: Formal structure as myth and ceremony. *American Sociological Review*, 83: 340-363.
- Mitchell, C. L., Boinski, B., & van Schaik, C. P. 1991. Competitive regimes and female bonding in two species of squirrel monkeys. *Behavioral Ecology and Sociobiology*, 28: 55-60.
- Morgan, G. 1997. *Images of organization* (2nd ed.). Thousand Oaks, CA: Sage.
- Nelson, R. R. 1995. Recent evolutionary theorizing about economic change. *Journal of Economic Literature*, 33: 48-90.
- Nicholson, N. 1997. Evolutionary psychology: Toward a new view of human nature and organizational society. *Human Relations*, 50: 1053-1078.
- Nicholson, N. 1998. How hardwired is human behavior? *Harvard Business Review*, 76(4): 135-147.
- Nishida, T. 1968. The social group of wild chimpanzees in the Mahali Mountains. *Primates*, 9: 167-224.
- Nishida, T. 1979. The social structure of chimpanzees of the Mahale Mountains. In D. A. Hamburg & E. R. McGowan (Eds.), *The great apes*: 73-121. Menlo Park, CA: Benjamin/Cummings.
- Pfeffer, J., & Salancik, G. B. 1978. *The external control of organizations: A resource dependency perspective*. New York: Harper & Row.
- Pinker, S. 1997. *How the mind works*. New York: Norton.
- Power, M. 1988. The cohesive foragers: Human and chimpanzee. In M. R. A. Chance (Ed.), *Social fabrics of the mind*: 75-103. Hove, England: Lawrence Erlbaum Associates.
- Power, M. 1991. *The egalitarians—human and chimpanzee: An anthropological view of social organization*. Cambridge, England: Cambridge University Press.
- Reynolds, V. 1965. *Budongo: An African forest and its chimpanzees*. New York: Natural History Press.
- Roethlisberger, F. J., & Dickson, W. J. 1939. *Management and the worker*. Cambridge, MA: Harvard University Press.
- Rowell, T. E. 1966. Forest living baboons in Uganda. *Journal of Zoology*, 149: 344-364.
- Sagan, C., & Druyan, A. 1992. *Shadows of forgotten ancestors: A search for who we are*. New York: Ballantine Books.
- Smuts, B., Cheney, D. L., Seyfarth, R. M., Wrangham, R. W., & Struhsaker, T. T. 1987. *Primate societies*. Chicago: University of Chicago Press.
- Southwick, C. H. 1967. An experimental study of intragroup agonistic behavior in rhesus monkeys. *Behavior*, 28: 182-209.
- Studd, M. 1996. Sexual harassment. In D. M. Buss & N. M. Malamuth (Eds.), *Power, sex, conflict: Evolutionary and feminist perspectives*: 54-89. New York: Oxford University Press.
- Sugiyama, Y. 1968. Social organization of chimpanzees in the Budongo Forest, Uganda. *Primates*, 9: 225-258.
- Sugiyama, Y., & Ohsawa, H. 1982. Population dynamics of Japanese monkeys with special reference to the effect of artificial feeding. *Folia Primatologica*, 39: 238-263.
- Symons, D. 1992. On the uses and misuses of Darwinism in the study of human behavior. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture*: 137-159. New York: Oxford University Press.
- Thompson, J. D. 1967. *Organizations in action*. New York: McGraw-Hill.

- Tichy, N. M., & Sherman, S. 1993. *Control your destiny or someone else will: How Jack Welch is making General Electric the world's most competitive corporation*. New York: Doubleday.
- Wilson, E. O. 1975. *Sociobiology: The new synthesis*. Cambridge, MA: Harvard University Press.
- Wilson, E. O. 1978. *On human nature*. Cambridge, MA: Harvard University Press.
- Woodburn, J. 1982. Egalitarian societies. *Man*, 17: 431-451.
- Wright, R. 1994. *The moral animal: Evolutionary psychology and everyday life*. New York: Pantheon.

**Barbara Decker Pierce** is a doctoral candidate at the Richard Ivey School of Business. She received her MSW from the University of Toronto and holds an MBA from the University of Western Ontario. Her dissertation addresses the evolution of organizational social structure, which arose from her curiosity about cooperative behaviors.

**Roderick White** is an associate professor in general management at the Richard Ivey School of Business; there he teaches strategy at the undergraduate, Master, and doctoral levels. He received his DBA and MBA from Harvard University and his Honors BA (business) from the University of Western Ontario. His research interests are in the renewal of mature organizations and the evolution of social structure.

Copyright of *Academy of Management Review* is the property of *Academy of Management* and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.