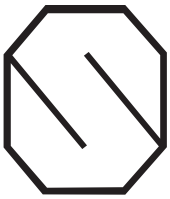

A Theory of the Cultural Evolution of the Firm: The Intra-Organizational Ecology of Memes

John Weeks and Charles Galunic

Abstract

In this article, we propose a theory of the cultural evolution of the firm. We apply cultural and evolutionary thinking to the questions posed by theories of the firm: What are firms and why do they exist? We argue that firms are best thought of as cultures, as social distributions of modes of thought and forms of externalization. Using the term 'meme' to refer collectively to cultural modes of thought (ideas, beliefs, assumptions, values, interpretative schema, and know-how), we describe culture as a social phenomenon, patterns of symbolic communication and behavior that are produced as members of the group enact the memes they have acquired as part of the culture. Memes spread from mind to mind as they are enacted and the resulting cultural patterns are observed and interpreted by others. The uncertainties of interpretation and the possibilities of reinterpretation and recontextualization create variation in the memes as they spread. Over time, firms evolve as a process of the selection, variation, and retention of memes. Our claim is that understanding firms in this way provides a new perspective (what we call the 'meme's-eye view') on the question of why we have the firms we have and, by allowing us to shed the functionalist assumptions shared by both economics and knowledge-based theories of the firm, makes possible a genuinely descriptive, as opposed to normative, theory of why we have the firms that we have.

Keywords: organizational culture, evolution, intra-organizational ecology, theory of the firm

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Introduction

Theories of the firm seek to answer the question: Why do we have firms? Yet, in phrasing the question that way, we must not lose sight of the important extent to which *firms have us*. Business organizations exert a tremendous cultural influence in modern society. Not only do we have an organizational *economy*, as Simon (1991: 28) says, but our expectations, preferences and, indeed, our very sense of identity are shaped by organizational forces. It is perhaps this pervasive cultural influence that makes it so difficult to answer the question of why firms exist. The most direct answer may be that we have firms today because we had them yesterday. That is, we believe we need firms in large part because we have been schooled to believe we need them. They serve our purposes because they have a hand in defining those purposes and in evaluating their achievement.

Organization Studies
24(8): 1309–1352

If this is true, it means a functionalist approach that treats firms as if they were merely our tools and seeks to explain their existence by identifying the efficiency or effectiveness advantages afforded by coordinating business activities in a firm, rather than through a market, will not get us very far. Any serious theory of the firm has to be able to explain why we have the organizations we actually do have, with their persistent mix of functional, dysfunctional, and apparently indifferent elements. It is not enough to explain the firms we *should* have and dismiss the rest as noise. Nevertheless, this has been the approach that theories of the firm have traditionally taken. They have been essentially normative theories, though claims have been made for their descriptive power as well. They have proceeded by identifying why we *should* have firms (their performance advantages over market forms of coordination) and assuming that if these advantages exist in theory they will be realized in fact.

We argue that a truly descriptive theory of the firm needs to take seriously the idea that firms are fundamentally cultural in nature and, further, that cultures evolve. It must explain why the cultural patterns we recognize as firms have emerged and how they evolve. Accordingly, in this article, we propose a theory of the cultural evolution of the firm. We first consider the two most influential extant theories of the firm to motivate our argument and show that our theory can capture the important insights of these earlier efforts while avoiding their limitations. Next, we outline our theory of how firms as cultures evolve through the retention, selection, and variation of *memes*, a concept we define and elaborate. Lastly, drawing heavily upon the historical data gathered by Chandler (1962; 1977), we turn directly to the question of the origins and persistence of the cultural form we call the firm.

Extant Theories of the Firm

The first theory of the firm, and probably still the most prominent, is transaction cost economics (Coase 1937; Williamson 1985). Its thesis is that firms exist to the extent that they are efficient contractual instruments. That is, individuals will organize themselves in a firm, rather than contract in a market, when doing so economizes on transaction costs. In the past decade, an important challenger to this economic theory of the firm has emerged: a knowledge-based view of the firm that is grounded in the fields of organization theory and strategy (Kogut and Zander 1992; Conner and Prahalad 1996; Grant 1996). The knowledge-based theory of the firm posits that firms exist because they are better than markets at integrating and applying valuable knowledge to business activity.

The transaction cost and knowledge-based theories of the firm are not mutually contradictory and, in fact, can be considered complementary. They share many of the same assumptions, in particular the assumption that business organizations exist because they offer some economic advantage to members. Conner and Prahalad (1996: 478) go so far as to say that the primary contribution of the knowledge-based view is to round out transaction cost

theory by recognizing 'knowledge-based transaction costs'. No matter how modest an advance this may sound, it moves the knowledge-based view several strides closer to the goal, first articulated by Williamson and Ouchi (1981: 347), of drawing upon the insights of organization theory to enhance purely economic theories of the firm. The theory of the firm that this article proposes builds upon the knowledge-based view to bring us still closer to realizing that goal.

Our theory conceptualizes the firm not merely as a knowledge-bearing entity, but as a culture-bearing entity, wherein the concept of culture includes shared knowledge, but also the other modes and forms of shared beliefs, meanings, values, behaviors, language, and symbols in the firm. It is important to emphasize that some elements of culture in the organization will enhance the organization's performance and further the interests of its members; others will not. A descriptive theory of the firm must be able to explain both. We posit a set of mechanisms to explain how organizations evolve as cultures, while avoiding the narrow functionalist assumption that all is for the best in this best of possible worlds. To understand why a cultural theory of the firm, and in particular, a theory of the cultural *evolution* of the firm, is a necessary move, we need to be specific both about the ways in which the knowledge-based view has advanced beyond the transaction cost perspective and the ways in which it remains captive to economic theories of the firm. The knowledge-based view improves upon transaction cost theory in the way it defines firms, in the fundamental assumptions it makes about organizational behavior, and in the perspective it takes toward firms. In each of these three areas, though, certain limiting commitments of the knowledge-based view prevent it from going as far as it should in leveraging organization theory to provide a satisfactory, fully rounded theory of the firm. After outlining these advantages and limitations, we describe why a theory of the cultural evolution of the firm is well suited to capture the improvements, while overcoming the constraints.

Defining Characteristics of the Firm

The first advantage of the knowledge-based view, at least as expressed by authors such as Kogut and Zander (1992), over transaction cost economics is that it employs a more robust definition of what a firm is and how firms differ from markets. In transaction cost economics, authority relations define the difference between a market and a firm (Coase 1937: 392). The distinction works like this. Imagine actors A and B who desire to form a joint enterprise and are deciding whether to do so in the market or as a firm. In a market, A and B would contract with each other for specified outputs. In a firm, A would employ B, and would have authority to manage the actions of B. It is this assumption of hierarchy as the defining element of a firm that leads Williamson to call his research program 'Markets and Hierarchies'. Where hierarchies differ from markets is in the *control* they exert. In a market, A and B remain autonomous. In a firm, B fully submits to the control of A, or of the firm more generally.

To define the firm as hierarchical is a curious move in light of the etymology of the word 'firm'. According to the *Oxford English Dictionary*, the word 'firm' originally denoted the name under which the business of a commercial house is transacted, its symbol of identity. It came then to refer to a partnership of two or more persons for carrying on a business and then expanded to its broad modern definition as any sort of business organization. Technically, the category of firm includes all business organizations, including both companies and partnerships. Of course, hierarchy is a common element in business organizations — even in many partnerships. But it is not the *defining* attribute. If A and B were to decide to form an equal partnership together, we would be justified in saying that they had created a firm even though no hierarchical authority relations were established.

The defining difference between a market and a firm, in other words, is not merely one of control. It is also an issue of *identity*. That firms provide an identity for their members is a key insight of the knowledge-based view (Kogut and Zander 1992). As Kogut and Zander (1996) conceptualize it, this identity is expressed in such things as shared coding schemes, language and cognitive schema, the conventions and rules by which people coordinate their behavior and decision-making, shared moral values and convergent expectations. It reflects participation, in other words, in a shared culture. The knowledge-based view makes the claim that it is the presence of this shared culture that affords firms lower knowledge-based transaction costs than markets, but it leaves culture exogenous in its theorizing. This is an important omission. If a culture must be in place before we can even consider the question of how much value will be created by some piece of knowledge (as Kogut and Zander (1992: 388–389) and Conner and Prahalad (1996: 488) each imply) and before we can know what the transaction costs might actually be (as Williamson and Ouchi (1981: 362) note and Boisot (1986) discusses), then any fundamental theory of the firm must be able to address the question of why the particular cultural patterns we call firms form in the first place. Transaction cost theory and the knowledge-based view, in other words, presuppose a theory of culture.

Assumptions

The second advantage of the knowledge-based view is that it assumes less than the transaction cost theory of the firm. It is worth remembering that Coase (1937: 386) originally motivated the explicit development of a theory of the firm on the basis that it was necessary to clarify and improve judgments about the assumptions under which economists operated. Transaction cost economics makes three assumptions: bounded rationality, opportunism, and functionalism. As Williamson and Ouchi (1981: 350) argue, if the hyper-rationality assumption of neo-classical economics is maintained, then organizational structure is of little economic importance. Only when people are realistically assumed to be unable to construct complete contracts with each other as autonomous market agents (that is, only when they are assumed to be boundedly rational) does the difference between market and firm organization

imply a difference in transaction costs. Similarly, if everyone is assumed to be completely honest and always trustworthy, such that there is no threat of opportunism, then all parties can be counted upon to honor the spirit of an incomplete contract as well as they would the letter of a complete one. Again, the assumption of opportunism creates efficiency implications about whether transactions are undertaken in the market or within a firm.

A central element of the knowledge-based view is that it does not require the assumption of opportunism (Kogut and Zander 1992: 383; Conner and Prahalad 1996: 477). Enabling the relaxation of a key assumption would seem to make the knowledge-based view more elegant and parsimonious and, therefore, more attractive than the transaction cost theory. In fact, however, the advantage is slight and overemphasized in the knowledge-based view. The assumption of opportunism in transaction cost economics is of a weak form — it does not require that everyone be assumed to lie, cheat and steal, merely that *some* agents behave in this way and that it is costly to sort out those who are opportunistic from those who are not (Williamson and Ouchi 1981: 351). That is not unrealistic. Theorists of the firm looking to improve upon transaction cost economics are right to focus attention on the limiting assumptions of that theory. From the point of view of organization theory, however, neither the assumption of bounded rationality nor of scattered opportunism is particularly limiting.

Far more constraining and unrealistic is the assumption of functionalism at the heart of the transaction cost argument. This is the assumption that not only *should* transaction costs be economized, but, given enough time (Williamson and Ouchi (1981: 363–364) suggest 10 years as an upper limit), the selection mechanism of competition will ensure that they *are* economized. Authors such as Perrow (1981) have focused on this assumption in their critique of transaction cost economics because it ignores the concepts of power and sense-making that are central to our understanding of how organizational behavior may become detached from efficiency considerations. For the transaction cost theory of the firm to be not just normative, but also descriptive, a mechanism must be posited to explain how the economies of transaction costs are identified and realized. It is implausible that all actors always accurately recognize the costs of their transactions and unfailingly act to economize them. This not only violates the assumption of bounded rationality, but also contradicts what we know about human sense-making. It is equally unrealistic to claim that all of those actors (be they individuals or firms) who make poor decisions in terms of their transaction cost implications are therefore selected out by competition. For this to be true would require levels of competition approximating neoclassical perfection and far higher than we typically find empirically or would expect theoretically, given what we know about the importance of power considerations.

The knowledge-based view of the firm is no less functionalist in its assumptions than transaction cost theory. Reflecting its foundations in resource-based theories of performance differences between competing firms, the knowledge-based view recasts the question of why firms exist as follows:

> 'We begin with an assumption that is standard in the theory-of-the-firm literature: that an individual's earnings depend on the profitability of the enterprise, be it autonomous contracting or employment within a firm. Our problem becomes, therefore, to inquire when firm organization results in more profitable business activity than market contracting.' (Conner and Prahalad 1996: 484)

There are actually two assumptions here: (1) that the interests of the individual and the enterprise are aligned; and (2) that individuals can and always do accurately identify a priori the profit implications of firm organization and market contracting when deciding whether to create a firm, or are unfailingly selected out afterward. It is not clear that Conner and Prahalad are correct when they assert that the first assumption is standard in theories of the firm. It would seem to contradict, for example, the assumption of opportunism made by transaction cost theories of the firm and to suggest that, rather than relaxing the assumption of opportunism, knowledge-based theories of the firm may have, instead, unwittingly adopted its unrealistic opposite: that no one ever acts such that they gain at the expense of the enterprise. They may have replaced an under-socialized view of action with an equally inappropriate over-socialized one. The second assumption has the same problems that we discussed above with transaction cost theory. It is implausible unless we take the knowledge-based view to be a purely normative theory, rather than a descriptive one.

The knowledge-based view reduces the question of why firms exist to the problem of demonstrating that, to use Kogut and Zander (1992: 383) as an example this time, 'what firms do better than markets is the sharing and transfer of the knowledge of individuals and groups within an organization'. This has the important implication that knowledge is conceptualized quite narrowly as information and know-how that directly influences firm performance and growth. As we discussed above, firms are theorized to be better than markets at knowledge sharing because of the shared sense of identity of firm members. This shared identity is built through culture (the shared coding schemes, language, beliefs, values and patterned behavior that make it possible to create, identify, value, transfer and exploit knowledge), and this takes time. What is more, though shared culture is required to capture the knowledge-related benefits of the firm, it is also always limiting with regard to what sort of future knowledge can be captured and exploited. The knowledge-based view describes this as the problem of complementarities. Knowledge grows in a path-dependent way: what is already known shapes what can be learned in the future because of the effect that new information and new capabilities have on other elements of the culture of the firm and the need for there to be some degree of cultural consistency or coherence.

For these reasons, it is implausible that A and B would make the decision about whether or not to form a firm solely on the basis of the cost economies of a single 'knowledge transaction'. It is perhaps possible to conceive of A and B trying, within the limits of their bounded rationality, to estimate the net present values of the rent streams accruing from various future knowledge trajectories as they decide whether to come together as a firm and, if so, to arrive at the optimal design for the firm culture that they want to create. This

is unnecessarily complicated, however, and hardly seems consistent with the spirit of the knowledge-based view.

We suggest that an evolutionary model may fit better here than such a creationist model. As cultures, firms evolve over time; they are forever changing gradually in path-dependent directions punctuated, possibly, by periods of large-scale rapid transformation. This cultural evolution need not be functional from the point of view of the organization as a whole. There are no grounds for assuming that cultural patterns necessarily emerge among a social group because they benefit all members of that group equally. The exercise of power may mean that some cultural patterns please and benefit certain people at the expense of others or the group as a whole. What is more, even in the most carefully managed organizational cultures, unanticipated consequences are an ever-present feature (Van Maanen 1991; Kunda 1992), and some elements of culture may emerge that seem neither to please nor to benefit anyone (Weeks 2004). Central to the conception of culture that we draw upon in our theory is the idea that though cultural outcomes are not independent of the interests and desires of cultural members, neither are they fully determined by them. Culture is an emergent social phenomenon. Even firms that are self-consciously created for well-defined instrumental purposes are seldom dissolved when those purposes are met and, rather, evolve certain values and competencies that create the possibility of new mandates unforeseen by their founders (Selznick 1957).

The evolution of culture is shaped by agency and power, but culture cannot be created by fiat. Rather than view firms as the consciously designed tools of originally autonomous individuals, we propose that it is more fruitful to view them as the outcome of an ongoing process of cultural evolution. This is consistent with many elements of the knowledge-based view. What is required in addition, however, is a rigorous explanation of the mechanisms by which the evolution proceeds. A theory of the cultural evolution of the firm, therefore, should incorporate the generic variation, selection, and retention algorithm common to all evolutionary systems (Campbell 1969) and specify the particular mechanisms of each in cultural evolution. That is the project occupying most of the rest of this article.

Before turning to that task, however, we must establish one more piece of the foundation. So far, we have been talking almost as if firms were cultural monoliths, as if the beliefs and meanings and values and language and conventions and other elements of culture were perfectly shared across the organization, and as if individuals adopted the identity of their new firm wholesale when they join. None of these statements is true and, as the next section makes clear, the facts of cultural diversity within firms, of the multiple social identities of firm members, and of the always only partial sharing of cultural elements need to be a central part of a theory of the cultural evolution of the firm.

Intra-Organizational Perspective

The final advantage of the knowledge-based view relevant to our argument is the perspective it takes of the firm. Transaction cost economics views the

firm not quite as a black box, but as a monolith: an authority relation or employment contract. There is assumed to be no important variation within the firm; the focus is on such phenomena as the make-or-buy decisions made by firms. The perspective of the knowledge-based view, on the other hand, looks inside the firm as well. Starting from the premise that every individual has at least a slightly different set of knowledge and that some of that knowledge may be tacit and not easily articulated and shared, the knowledge-based view argues that these knowledge variances are key to understanding why we have firms because the variances create knowledge-based transaction costs and opportunities. Firms, then, provide the shared cultural supports that facilitate the integration and exploitation of the valuable knowledge of various individuals.

However, what the knowledge-based view does not explicitly address is the fact that individuals vary not just in the knowledge they possess, but also in the degree to which they share in the entire cultural inventory. Culture is never perfectly shared. Kogut and Zander (1996: 504) quote Immanuel Kant (1784), who wrote about the *unsocial sociability* of human beings. To wit, we have a need to belong and therefore value for its own sake the sense of community and identity offered by firms. But we also have a need for autonomy. As Goffman (1961) notes, we do not accept the identity we are provided with without also finding culturally legitimate ways to distance ourselves from it. We arrive at the firm with an identity already built. We accommodate ourselves to the new identity by selectively highlighting some aspects and leaving others in shadow. Even the most gray-flannel-suited organization man (Whyte 1956) is an individual. As we are socialized into the firm, we learn more and more of the culture, but likely we never learn it all and seldom do we accept everything we have learned.

This is not just pointing to the presence of subcultures within firms. It is, following Balkin (1998: 49), to say that the concept of culture requires what biologist Ernst Mayr has called 'population thinking'. Cultures (and subcultures too, for that matter) are made up of populations of individuals that carry and reproduce slightly different combinations of similar cultural elements. In this sense, each culture is a radial category, as described by Lakoff (1987), with the accurate cultural stereotype at the center (the mythical cultural prototype) surrounded by individuals who reflect that stereotype to greater or lesser degrees and who may not all share any particular element of the culture in common, but who, nevertheless, have what Wittgenstein (1958: sections 66–71) calls a *family resemblance*. They share enough of the beliefs and values and meanings and language to be recognized and to recognize themselves as part of the culture.

To put it another way, cultures are socially distributed, and typically unevenly so. As the anthropologist Ulf Hannerz (1992) puts it, cultures are social distributions of modes of thought and forms of expression. This complicates the study of culture in two ways that must be reflected in a theory of the firm. First, we need to theorize how this social distribution is formed and how it changes over time. That is, we need to be able to explain the ecology of ideas, beliefs, know-how and other modes of thought and their

expression as patterns of behavior and language and symbolic artifacts. How do these elements spread and take hold? Why do some persist and others fade away? We need a theory of the ecology of these cultural elements. Second, we must also explain how these elements of culture change as they spread across different parts of the firm and are reinterpreted, recontextualized and recombined. Lastly, building on the work already done within the knowledge-based view on the issue of complementarities, we must conceptualize the flow of culture across firm boundaries. Firms are not cultural islands, and we need to understand how new ideas and new ways of talking and behaving and thinking enter the firm and to understand the impact that they have on the existing culture. These are the required elements of a cultural theory of the firm that is fully evolutionary.

There is a second complication. Because culture is socially distributed, it is useful and necessary to consider the careers of cultural elements. Following the conventions of studies of cultural evolution, we use the term 'memes', first coined by Richard Dawkins (1989: 192), to refer collectively to cultural modes of thought: values, beliefs, assumptions, know-how, and so on. Culture results from the expression of memes, their enactment in patterns of behavior and language and so forth. In adopting such an analytical approach and focusing on particular elements of culture, however, we must not lose sight of the importance of systemic and holistic perspectives on culture. Neither culture nor knowledge divides itself neatly into independent units for our convenience. The meaning and effect of any element of culture depends less on its essence than on the context of the rest of the culture around it. We cannot look at memes in isolation. When conceptualizing how culture evolves through a process of the variation, selection, and retention of memes, we must explicitly take into account the fact that memes only make sense when we look at their patterns of combination.

From this discussion of the advances that the knowledge-based view of the firm has made by increasing our understanding of why we have firms and how best to conceptualize them, we can see an agenda for a new theory of the firm that sheds some of the remaining limitations of the knowledge-based view in order to achieve its aims. The theory must address not just knowledge, but culture as a whole. It must be evolutionary to explain the dynamics of how firms as culture change over time. It must not assume that firms necessarily evolve in ways that improve their performance or serve the interests of their individual members. It must explain how the variation, selection, and retention of memes has led to the cultural patterns we recognize as firms.

Lastly, it must deliver on the raison d'etre of a theory of the firm: to help us better understand and integrate the seemingly disparate strands of organization theory as it relates to business organizations. Such a theory should not seek to displace existing theories, but rather to serve as a platform from which those theories can be interpreted and reinterpreted. It should not seek to replace the social-psychological and sociological foundations of organization theory with something else, be it biology or economics, but rather to provide a mechanism for the loose coupling of the disparate parts of our multidisciplinary field. Like

Aldrich (1999: 21), we believe that an evolutionary approach (one grounded in theories of culture rather than biology) is well suited for this task. This is because evolutionary thinking at its best combines an elegant and parsimonious algorithm with rich, nuanced descriptions of local phenomena and theories of the middle range (Merton 1968). It is algorithmic, but deeply inductive. It imposes, for example, no assumptions about human nature and so avoids the essentialism that too often creates an impasse between theories and prevents the integration of their empirical insights. It establishes a clear, logically consistent and highly general underlying structure to explain behaviors and characteristics observed through close empirical analysis. A theory of the cultural evolution of the firm improves upon extant theories not by providing alternative causal forces or conceptions of human nature, but by providing a concatenating structure for linking them, extending their reach, and making it clear how they may be integrated.

Clearly, the development of such a theory is the subject of a research program, not a single article. What we can give here, however, is an outline of what a theory of the cultural evolution of the firm should look like.

Memes: The Unit of Cultural Selection

The label 'evolution' has been used for so many purposes and misused so often that it is important for us to make clear what we mean, and what we do not mean, when we use the term. Evolution is sometimes used in a general way to indicate a process of gradual change, but we mean it in the specific sense of a theory that conceptualizes change to a population in terms of the selection, variation, and retention of elements in that population. To say that something has evolved specifies the mechanisms by which changes have occurred, not the speed or magnitude of those changes. Evolution is sometimes used as a wedge to insert biology into matters of social science. We mean it, however, as an algorithm of selection, variation, and retention that is substrate neutral (Campbell 1969). Because evolutionary theory is most fully developed in biology, analogies drawn from that field may be useful (especially when they are counter-intuitive and challenge our thinking), but there are important differences between the processes of biological and cultural evolution that we shall discuss as well. Lastly, evolution has been used in ways that deny the importance of human agency or that are teleological: assigning an immanent direction or design to evolution and equating change with progress. We mean it as a theory that addresses directly the fact that culture is 'created by intentional activities but is not an intended project' (Giddens 1984: 27). What this means is that the overall, intricate patterns of culture that we call firms are not best understood as the result of the conscious and coherent designs of astonishing organizational leaders. Instead, for better and for worse, they emerge step-by-step out of the interactions of intendedly rational people making what sense they can of their various situations, pursuing their various aims, and often acting in ways that they have difficulty explaining, even to themselves.

In its essence, evolution is a very simple algorithm. There are replicators (the genes making up individual plants or animals, in the biological case) competing for scarce resources. There is variation among the replicators, leading some of them to do better in this competition than others and to be more likely to be replicated than others (they are 'selected' for replication by the environment). Also, because offspring tend to resemble their parents, advantageous variations are retained from one generation to the next. Whenever you have this variation, selection and retention, evolution will occur.

The key is that evolution postulates a population of replicators, but it makes no assumptions about what those replicators might be. They might be urban legends, for example, or organizational practices. What is characteristic of them is that they are replicated, they have offspring: they are retold or they are reproduced in new parts of the organization, for example. Those offspring are replicated in turn and so their population grows until, Malthus tells us, at some point, they reach the limits of the environment needed to sustain them. They run out of human attention or new markets or some other resource that they need to continue to replicate. At this point, not all of the offspring in one generation will replicate in the next. Some, starved of the scarce resource, will die, in the sense of being forgotten or supplanted.

If all the elements in this population were exactly identical, then simple random selection would determine which were replicated and which were not. However, if there are variations among them and if those variations mean that some of them are better able to acquire and exploit the scarce resources than others, then those with advantageous variations will be more likely than others to be reproduced. So, for example, if people are more likely to remember and retell legends that are more disgusting (Heath et al. 2001), then more disgusting versions of a story will have an advantage. If organizational practices that are easier to imitate are more likely to be transferred to new parts of the organization (Zander and Kogut 1996), then the easily imitated practices will have an advantage. As Darwin puts it:

> 'More individuals are born than can possibly survive. A grain in the balance will determine which individual shall live and which shall die — which variety or species shall increase in number, and which shall decrease, or finally become extinct.' (Darwin 1859: 467)

If those variations are passed on to offspring (for example, if the disgusting stories are retold with all of their disgusting elements intact and the easily imitated practices are transferred without loss of imitability), then over time those advantageous variations will become more and more prevalent in the population.

Assuming the environment stays the same, every generation of offspring will be slightly better adapted to that environment. Each succeeding population will contain a greater fraction of those variations that have proven, by the fact that they were able to reproduce in greater numbers, that they are better able to acquire and exploit the resources they need than are competing variations. Selection assumes competition for a scarce resource; retention

assumes the ability of the replicator to be copied accurately; and variation assumes that this copying is not always perfect. Darwin's theory is that evolution occurred, the splendors of nature evolved, because nothing in life (in particular, no copying process) is perfect. There is something wonderful about that. More prosaically, anyone who has spent time in firms can be sympathetic to the idea that they, too, evolved because nothing in life is perfect.

Firms and markets are cultural entities. They have evolved in the same way any part of culture evolves: through the selection, variation, and retention of *memes*. Memes are the replicators in cultural evolution. They are modes of thought (ideas, assumptions, values, beliefs, and know-how) that when they are enacted (as language and behavior and other forms of expression) create the macro-level patterns of culture. Memes are units of information stored in the brain that replicate from brain to brain as people observe and interpret their cultural expression. There are three important things about this definition, and we will discuss each of them in turn: memes are small; memes always create their cultural effects in combination with other memes; and memes are units of information stored in individual minds. Culture, on the other hand, is a social phenomenon created through the enactment of those memes in combination. Memes are the genes of culture. Just as plants and animals and all biological organisms are the phenotypic expression of particular combinations of genes, so cultural patterns such as firms are the phenotypic expression of particular combinations of memes.

Small Replicators

There is an analogy to the theory of the firm in evolutionary biology. It is the theory of the organism. In similar fashion to the theory of the firm, it asks the question: Why do we have organisms? This theory was first elaborated by Dawkins (1982), who suggested that biologists should not take the presence of organisms for granted. The original replicators in biological evolution, after all, were single molecules. The question is raised, therefore, why did these replicating molecules gang up in cells and cells into multicellular clones? Why, in other words, did genes join forces to become the DNA of complex organisms such as animals? This question makes sense because organisms themselves are not the fundamental replicators in biological evolution. Genes are the replicators. Except for the case of asexual creatures, an organism does not create a clone of itself when it reproduces. Instead, it creates a new organism that has a random mixture of its genes and the genes of the other parent. Actually, even in asexual organisms, variation occurs at the level of the gene. What varies in a single generation is, for example, the gene for red eyes versus black eyes, not the genome of the fruit fly versus the genome of the house fly. This is why the process is so gradual. Complex animals have genes numbered in the thousands (fruit flies have roughly 15,000 and human beings we now know, thanks to the human genome project, have at least 30,000). Natural selection works as a statistical process on these genes. Through the birth and death and reproduction of organisms, some

genes are replicated more than others. This is how species evolve: through the selection, variation and retention of *genes* in the gene pool. More generally, we can say that multicellular organisms (the firms of the biological world) evolved because genes that were part of such organisms tended to replicate more than those that remained individual molecules. We have organisms because they are a good way for genes to replicate themselves.

We argue similarly that firms have evolved because those memes that are part of firms tend to replicate more than similar memes that are not part of firms. We have the firms we do, in other words, not because they are necessarily good for society or good for their members (though often they are both), but fundamentally because they are good ways for memes to replicate themselves. This may sound wildly counter-intuitive, but it rests solidly on two premises, one from evolutionary theory and the other from our understanding of what culture is and how it operates. The first premise is that if we want to understand the evolution of firms, we cannot take the firm itself as the replicator (Campbell 1994). Firms do not replicate themselves *in toto*. Certainly, firms compete for scarce resources, such as customers and capital. Some do better than others in this competition, and the losers may be 'selected out' in the form of dissolution. Population ecologists study such dynamics. However, as the name suggests, population ecology is a theory of *ecology* and not of *evolution* (Hannan and Freeman 1989: 20). This is because its models are suited to explain patterns of selection, but not variation or retention. Population ecology posits as an organizational DNA, a 'blueprint' of the organization, or an 'organizational form' that can be inferred from the formal structure, patterns of activity, and forms of authority (Hannan and Freeman 1977: 935). The problem, however, is that selection is theorized as occurring to this blueprint or form as a whole. Different forms, such as 'formal bureaucracy' or 'small organizational form' and 'large organizational form' are viewed as competing to replace each other in the population. In essence, then, population ecology treats firms as if they had a single gene. An organization's DNA is made up of one big gene (its 'form') that either replicates in its entirety or is replaced with something completely different. Indeed, to emphasize that this is not a gradual process, Hannan and Freeman (1977: 938) argue explicitly that when an organization reaches the size boundary where it moves from small form to large form the change should be seen as the death of the small organization and the birth of a large one.

The problem with this view for an evolutionary theory is that forms such as 'formal bureaucracy' did not appear, fully specified, all at once. They evolved over time (see Aldrich 1999). The same is true for the cultural forms of market and firm. Neither are all firms or all markets or all formal bureaucracies or all large or small organizations immutably identical. There is almost infinite variation within each of these categories. This, in fact, is what makes their evolution possible. In order to explain how the firm (or any other cultural form) has evolved, we need to be able to conceptualize within-category variation. To do that, we need a unit of selection that is smaller than the firm as a whole. To explain why cultural patterns with the identifying characteristics of firms have emerged, we need to postulate a unit of selection

that, like the gene in biology, is fine-grained enough to correspond to those characteristics. This is to say, for example, that in order to understand how a population of rabbits has evolved, we need to look not just at the relative success of rabbits and foxes, but also at the relative success of rabbits with different characteristics — long ears, bright eyes, bushy tails, button noses, and so on. The genes for these features are the important replicators in rabbit evolution. Likewise, the replicators that vary and are selectively retained in a theory of how firms evolve must correspond to the myriad elements that constitute firms. In other words, while selection pressures may operate at multiple levels and an integrative theory of organizational evolution is a desirable goal (Baum and McKelvey 1999), such a project has as its prerequisite a theory of the selection, variation, and retention of small replicators.

Systemic Elements and Social Phenomena

The first premise, then, is that memes (or whatever other unit of selection we might propose in a theory of the cultural evolution of firms) are small and analytically divisible. The second premise concerns the interdependence of these analytically divisible elements and arises from taking firms seriously as cultural entities. The meaning of any single element of culture, whether it be a belief, a value, a behavioral pattern, or a symbol, depends to a large degree on the context of other cultural elements around it. We need to be precise, therefore, when we talk about the selection of memes. Selection favors those memes that have a replicating advantage in the current environment. This environment includes first and foremost the other memes in the culture. The biological analogy is useful again because exactly the same issue arises with genes. 'For example, if the gene-pool is dominated by genes that make animals seek dry places, this will set up selection pressures in favor of genes for an impermeable skin. But alleles for a more permeable skin will be favored if the gene-pool happens to be dominated by genes for seeking damp places' (Dawkins 1982: 111). What is more, there is no guarantee that if we were to transplant a gene found in one species to another it would have the same effect or any benign effect at all. The same is true when we pull memes from their context and replicate them in new contexts, as those who study the problem of recontextualization of knowledge have shown (for example, Nonaka and Takeuchi 1995).

The consequences of the presence of any particular meme, then, depends on the context of the other memes around it. But these dependencies are not always symmetrical. Some memes are more fundamental than others. Lakoff and Johnson (1999: 60), for example, show that a relatively small set of primary metaphors ('More is Up', 'Change is Motion', 'Categories are Containers', and so on) structure our conceptual system and form the bases of new metaphorical combinations. Memes that are deeply embedded in the culture in the sense that they appeared early in the course of historical development and form the building blocks out of which other memes have been fashioned are relatively impervious to change because of systemic

effects: sometimes to change one belief or one behavior would require that we change almost all of what we think and say and do (see Balkin 1998: 89). Culture builds on itself, and it does so like Levi-Strauss' (1966: 17) bricoleur: making use of the materials at hand. Memes are recycled and recombined, informing and constraining the creation of new memes. Some are implicated more than others.

In firms, these fundamental memes are akin to what Schein (1992) calls basic assumptions. They are deeply held assumptions about the nature of reality and truth, about time and space, and about the nature of human nature, human activity, and human relationships (Schein 1992: 95–96). When these assumptions are widely shared in a culture, they tend to be taken for granted and therefore pass unnoticed. They structure the way firm members think of the mission and goals of the firm, its core competencies, and the way things are done in the firm. Often borrowed and reinterpreted from some part of the wider context in which the firm is located, they are central to the identity of the firm and the identity that the firm affords its members. The concept of meme must be robust enough to include these taken-for-granted assumptions if it is to serve usefully as the unit of selection in a theory of the cultural evolution of the firm.

Why 'Memes'?

This raises a valid question: Why use a new term, 'meme', instead of 'assumption' or 'value' or 'belief' or 'interpretative scheme' or 'know-how'? The answer is that there are important differences between, for example, assumptions and values. Likewise, between beliefs and know-how. To consider culture only in terms of values or as being completely assumed, or to consider it as being only about sense-making and not about practice, would be to exclude essential elements from analysis. What is needed is an umbrella term for the category containing all cultural modes of thought. 'Meme' is that term, and with the advantage that there is a burgeoning interdisciplinary literature (admittedly of uneven quality) about memes, including works in philosophy (Dennett 1995), psychology (Blackmore 1999), social psychology (Heath et al. 2001), anthropology (Aunger 2002), and even law (Balkin 1998).

Within organization studies, there has been a fair amount of theoretical and empirical research loosely organized under the heading of *intra-organizational ecology* (for a review, see Galunic and Weeks 2001) and investigating the variation and selective retention of the elements that constitute firms. Various possible units of selection have been proposed in this work. Campbell (1975: 1104), for example, who was not writing specifically about organizations, but who has been very influential in organization studies, suggests 'skills, technologies, recipes, beliefs, customs, organizational structures' and several others as possibilities. Similarly, Aldrich (1979) discusses selection operating on organizational 'forms', but also 'subunits', 'styles of decision making', and 'type of control structure'. McKelvey (1982) talks about competence elements, or 'comps', which are roughly the skills and knowledge of a firm. Nelson and Winter (1982) take the organizational routine (their general term for all

regular and predictable behavioral patterns in the firm) as the unit of selection. Boyd and Richerson (1985), another outside influence on the field, use 'cultural variants' as the unit of selection in their theoretical modeling. Miner (1990) looked specifically at the ecology of jobs within a firm. Again, the concept of the meme as the unit of selection allows for a more general evolutionary theory of the firm because memes are the mode of thought corresponding to any replicating element of culture and thus encompass the various interdependent elements of firms proposed in these earlier works.

More importantly, if in one sense the concept of meme is useful because of its generality, in another sense, it is useful precisely because of its specificity: because of what it *does not* include. Memes are cultural modes of thought. The concept of meme preserves an important distinction, noted by anthropologists such as Hannerz (1992: 7), between modes of thought and their forms of externalization — between the memes in people's heads and the ways they talk and act and the artifacts they produce as a product of enacting those memes. This distinction is not new to organization studies. It is the difference between what Schein (1992: 17) calls 'artifacts' and 'basic underlying assumptions'. It is the difference, in Aldrich's (1999) terms, between 'internal representations' and their 'vehicles' or 'interactors'. Whatever labels are applied, the distinction is important: it allows us to study the distribution of memes across the individuals in the group without losing sight of the essential social character of culture. For memes effectively to serve the role in a theory of cultural evolution that genes play in biological evolution, we must be clear about this relationship between culture and memes. The firm is the product of memes in the way that the fruit fly is a product of genes. Just as there is an important distinction between the red eyes of a fly and the gene for red eyes, so there is a distinction between particular elements of culture and the memes that correspond to them. Weick (1979) discusses this. He argues that 'rather than select individuals or behaviors', selection pressures in organizations select such things as 'schemes of interpretation and specific interpretations' (Weick 1979: 131). Memes, the unit of selection, are in the mind. Culture, on the other hand, is social. Culture reflects the *enactment* of memes. Culture is a social phenomenon that is produced and continuously reproduced through the words and actions of individuals as they selectively enact the memes in their mind. Culture may be embedded in objects or symbols, but it requires an interpreting mind to have meaning and to be enacted.

With Memes in Mind

Ours is not a cognitive theory of culture. We do not make the strong reductionist claim of cognitive anthropologists such as Goodenough (1971) that 'culture is located in the minds and hearts of men'. We merely claim that without human minds to enact it and to interpret it, there could be no culture. Memes spread as they are replicated in the minds of people perceiving and interpreting the words and actions and artifacts around them (compare Hannerz 1992: 3–4; Sperber 1996: 25). They vary as they are enacted and reinterpreted. Nelson and Winter (1982: 119–120), for example, describe the

replication of routines in an existing production plant to a new plant as a process whereby each of the individuals who are to be part of the new routine observe their counterparts in the old routine, or are explicitly trained by them, and learn their roles — replicate their memes, in other words. When those individuals then come to perform their newly learned roles together, the routine is enacted. Nelson and Winter argue that routines are the genes of the firm. Looking closer at the analogy, routines are more like red eyes (a trait or characteristic) and it is the memes in the heads of the individual employees that are analogous to genes. What we recognize as cultural change can be conceptualized as a change in the social distribution of memes in the population.

To say that memes are in the mind raises the question of their materiality. There is some research in cognitive science that suggests it may one day be possible to identify individual memes as neural network patterns, and there is enthusiasm in that field that the material character of memes has changed from a mystery to that of an intelligible, albeit difficult, problem (see discussions in Damasio (1994) and Le Doux (2002), and see also Sperber (1996: 25)). The development of an evolutionary theory of culture, however, need no more wait for cognitive science to discover what a meme looks like inside the brain than did the development of Darwin's theory of natural selection and Mendel's of genetics have to wait 50 years for Crick and Watson to discover the molecular structure of DNA. Furthermore, it is useful to keep in mind that genes are, in their essence, patterns of information that just happen to be encoded in DNA molecules (Dennett 1995: 353). Genes are identified by the effect they have, and they may vary widely in their length and even overlap in the DNA chain. As Dawkins (1982: 21) points out:

> 'When a geneticist speaks of a gene "for" red eyes in Drosophila, he is not speaking of the cistron which acts as a template for the synthesis of the red pigment molecule. He is implicitly saying: there is variation in eye color in the population; other things being equal, a fly with this gene is more likely to have red eyes than a fly without the gene. That is all we ever mean by a gene "for" red eyes.'

Genes are inferred from their phenotypic effects in exactly the same way that we infer a distribution of memes from the cultural patterns we observe, and biologists face the same issue that the effects of individual genes always depend on the environment, especially the environment of other genes present. Van Maanen (1988: 3) captures the parallel well when he writes that culture is 'a concept as stimulating, productive, yet fuzzy to fieldworkers and their readers as the notion of life is for biologists and their readers'.

To locate memes in the mind is not to reduce the fuzzy wonders of culture to cognitive science or psychology. It does, however, highlight the fundamental importance of understanding the processes of enactment and interpretation through which culture and mind interact. It suggests how findings in cognitive science and psychology may contribute to our understanding of cultural dynamics. Studies of the structure of narrative and its effects on memory (Mandler and Johnson 1977), for example, help us to understand the mechanisms of retention and the patterns of copying errors in the replication of

memes. Studies of psychological biases (Kahneman and Tversky 1973) can help us to understand ways in which the make-up of our brains themselves may shape the selection of memes. In the future, studies of how the unconscious mind works to recombine ideas and create novel combinations may be able to help us understand the ever-changing variation of memes in the mind. A memetic approach to cultural evolution, then, is not dependent on advances in cognitive science or psychology, but is able to integrate them so as to deepen our understanding of the distribution of expressions in organizations.

The Meme's-Eye View

To understand the powerful implications of recognizing the meme, rather than the organization or the routine, as the unit of selection within cultural bodies, we need to return one last time to the biological analogy before it has taken us as far as it can conceptually and we may jettison it in order to consider the unique characteristics of cultural evolution in organizations. Dawkins coined the term 'meme' in his 1976 book *The Selfish Gene*. The book's title (perhaps too clever for its own good, since it tends to confuse people who have heard of the book, but have not read it) refers to the following argument. Given that, for the reasons we have discussed and that Dawkins goes into much greater detail to show, the gene and not the organism as a whole is the unit of selection and that which gets replicated and passed down from generation to generation, we need to realize that what evolution leads to over time is not survival of the fittest organisms, but survival of the genes best able to reproduce themselves. Obviously, in most cases, these two are congruent: the genes best able to reproduce themselves are those inside the fittest organisms. But it means that since reproduction usually increases the frequency of a gene faster than mere longevity of the organism holding the gene, we should not be surprised by cases in nature such as the cannibalism of the female preying mantis, who bites the head off the male during copulation. Likewise, since siblings share genes, we should not be surprised by the evolution of altruistic behavior such as bees who sting us in kamikaze missions to protect their brothers and sisters in the hive, or rather to protect the genes they share with them.

We should expect the same with memes and organizations. All evolution proceeds from competition for a scarce resource. This is the Malthusian element of Darwin's theory: once there is not enough of a necessary resource for all replicators to have offspring, selection occurs as some are able to replicate and others are not. What is the scarce resource that memes are competing for? It is human attention. They are competing for the chance of human beings noticing their public expression (in writing, routine, cartoon form or whatever), to internalize them, and then to reproduce them. An important way that memes may acquire reproductive advantage is by their contribution to the success of the organization of which they are a part, through the benefits of the traits that they effect. But this is far from the only way. In the first place, contributing to organizational success may not be as important if the contribution is not also *recognized* as contributing to that success. If managers misunderstand the source of organizational success,

they may reproduce the wrong memes. If managers are more interested in furthering their own career than coming to the aid of their organization, they may be expected to reproduce memes they interpret as furthering that self-interest. The organization, its routines, its cultural distribution, will reflect that.

If competition at the level of the organization were sufficiently intense and organizations died in every generation without a chance to reproduce their memes, such dysfunctional memes (from the point of view of organizational welfare) would surely be selected out in time. But that is not the typical case. We hold that a theory of the firm must be able to explain not why we *should* have firms, but why we *do* have the firms (good, bad, and ugly alike) that we have. To see how a cultural theory of the firm rooted in evolution, with memes as the units of selection, can deliver on that promise, we need to examine in detail the processes of selection, retention, and variation of memes in organizations, and so see what they can help us understand about what business firms are and then why, from a meme's-eye view, firms have evolved as they have.

Mechanisms of Selection, Variation, and Retention

Selection

A meme is said to be selected in a firm when a member of that firm (either consciously or without conscious thought) enacts that meme from among those previously internalized. A meme is internalized by a member of the firm when he or she (again, consciously or unconsciously) observes and interprets the cultural expression corresponding to that meme. At any point in time, the pattern of selection events acting on a given variation of memes across the firm defines the *ecology* of memes in the firm. When we also include the effects of memetic variation and retention processes over time, we are then describing the *evolution* of the firm as a culture — certain memes, in various combinations, are selectively expressed and inform organizational behavior. Roughly speaking there are three categories of selection pressures operating on memes in firms: their *function*, their *fit*, and their *form*.

Of these, *function* seems the most obvious: memes may be selected because members of the firm believe that the reproduction of their phenotypic expression (the words or behaviors or whatever other cultural effect they produce when enacted) serves some function, that is, helps achieve some desired end. It is, however, not quite this simple for two reasons. First of all, the person or group of people can be right or wrong about the functionality of the meme. Of these two possibilities, the more interesting is the case of functionality being wrongly attributed. This is not uncommon since understanding the environment and selecting an appropriate response is notoriously difficult (Hogarth and Makridakis 1981; Mintzberg 1994). Further, managers are boundedly rational and cannot be assumed to discover or select the optimally functional beliefs or behaviors (Simon 1955; Nelson and Winter

1982). In many instances, this may not matter because events will conspire to ensure that the selection of a dysfunctional meme does not persist. As the person or group gets further toward, rather than closer to, their desired end, they will notice this and attribute it in part to their expression of this meme (for example, their avowed belief in this particular idea or their behaving in this particular way), and they will stop reproducing it. If they do not, their performance may become so poor that they will be removed from their position of responsibility in the firm or be fired from it altogether. If they are not dispatched in some way, the part of the firm they are in may be closed, canceled or outsourced. If none of these remedies is effected, the firm may fail. In each of these outcomes, the dysfunctional meme will cease to be selected for expression by those individuals in this firm (see also Durand 2001).

Yet, we well know that none of those outcomes is guaranteed. Individuals and groups may persist in their false recognition of how well they are doing in achieving their aims (they may be ignorant, for example, of better practices elsewhere) and so believe that they are doing as well as can be expected and not recognize a need to change (Szulanski 1996: 28). Alternatively, they may recognize their predicament, but misattribute its causes and thus persist in the expression of the meme anyway. As Sitkin (1992) points out, without episodes of clear failure, learning is stunted as the wrong lessons are learned. Since organizational causes and effects are often distant in time and space, such misattributions are likely (Senge 1990; Kuwada 1998) as are the problems of superstitious learning (Argyris and Schon 1978; Miner and Mezias 1996). Competition among individuals and units within the firm is typically not strong enough to produce the Malthusian conditions required for natural selection at that level where 'a grain in the balance' means the difference between an individual retaining his or her duties or not. We know that in many cases managers are shielded from the consequences of their decisions, for example, because of the presence of ambiguity or slack (Garud and Van De Ven 1992). Neither is it so strong at the level of the firm — the possibility of permanently failing firms (Meyer and Zucker 1989) being an extreme instance of the more common truth of permanently mediocre firms. Selection pressures are only sufficiently strong at the level of the meme, and what we see is that functionality, in itself, is not decisive at this level.

Individuals do not always select memes in order to further the ends of the firm. It is implied, in one form or another, in various works on firm adaptation (for example, Nelson and Winter 1982: 11; Usher and Evans 1996; Fox-Wolfgramm et al. 1998) that managers guide selection in an effort to match the firm's characteristics and capabilities with environmental requirements. This is naive. Memes are as likely to be selected because they are perceived as furthering local or individual aims as because they further the aims of the firm as a whole. As Meyer (1994: 110) argues, the advantage of employing an intra-organizational unit of selection is that we can reintegrate what we know about the ways in which conflicts of interest between owners, managers and employees shape organizational behavior and how antagonistic subcultures form within firms. The meme's-eye view gives us a vantage point

for explaining the ways in which authority is constructed and maintained in the organization and the role of incentives — issues too important in organizations to be ignored as they typically are in evolutionary theorizing.

So far, we have been talking about the aims of the firm, of groups within it, or of individuals, as if they were objective and self-evident. Clearly, they are not. Instead, they are the expressions of other memes, more or less widely diffused in the firm. Formal socialization (Van Maanen 1975) and managerial attempts to use organizational culture as a form of control (Kunda 1992) are processes designed to spread memes that express subgroup and individual aims in terms of certain organizational aims, promoting consistency and the identification of employees and subgroups with the firm. In other words, consistency between intra-organizational ecology and the fit between the resulting firm and its environment cannot be assumed, but must be explained as an accomplishment. Human agency in meme selection tends to be tactical, rather than strategic: it occurs as the consequence of the ongoing decisions taken by actors as they go about their daily work and, in situ, encounter demands, threats, and opportunities (Tyre and Von Hippel 1997). The extent to which this human agency improves the firm's life chances is an empirical question.

The more general point to be made here is that when we talk about the environment of a meme, we are talking mainly about other memes. It is *fit* more than any abstract notion of function that structures the selection process: memes that fit with other dominant memes are more likely to be selected. This is a lesson well learned from institutional theory:

> 'Institutional theory emphasizes that organizations are open systems — strongly influenced by their environments — but that many of the most fateful forces are the result not of rational pressures for more effective performance but of social and cultural pressures to conform to conventional beliefs.' (Scott 1992: 118)

Powell and DiMaggio (1991: 27–28) describe this environment as a system of 'cultural elements, that is, taken-for-granted beliefs and widely promulgated rules that serve as templates for organizing'. In other words, as a system of memes. What a theory of the cultural evolution of the firm suggests is that we have to bring institutional theory inside the firm to look, first, at how the isomorphism that it predicts between the firm and its environment actually evolves over time, and second, at how similar issues of legitimacy and social reproduction create selection patterns of continuity and routine at the intra-organizational level as well.

The memetic view shares a central assumption with institutional theory: choices and preferences cannot be properly understood outside the cultural and historical frameworks in which they are set (Powell and DiMaggio 1991: 10). Our perspective, our identity, is a cumulative construction of the memes we carry (see Cohen and Levinthal 1990; Le Doux 2002). We are a product of our memes. In much the same way that Mintzberg (1994) describes firm strategies as retrospective rationalizations of behavior, our biography is a story we tell ourselves to make sense of the behaviors and opinions we see ourselves express — 'How can I know what I think before I see what I say?'

Weick (1979: 133) asks, summarizing well this process whereby we come to discover the memes that are us. It is in this sense that memetic evolution is intensely path dependent: the present selection of memes depends on the pattern of memes selected in the past. At the level of the firm, this leads to what Winter calls 'preadaptation', wherein a firm's decisions about products and business lines are essentially made for it because its choices are so constrained by its existing distribution of ideas. He gives the example of IBM being naturally drawn to electronic computers because the electromechanical attributes of punch cards (an early product) could be readily translated to mainframe computer design (see also Klepper and Simons 2000).

By focusing analysis on the social distribution of memes within the firm, rather than assuming the firm is a monolith that adapts uniformly to its competitive or institutional environment, the memetic view suggests that isomorphism is always imperfect, and that there are always sources of variation that may evolve into important organizational traits. Burgelman's (1991; 1994) compelling account of how the idea for a microprocessor came to the fore in Intel at a time when suggestions that the firm diversify from the memory business were illegitimate provides a good example. The meme was spread by a group of middle managers who well understood the institutional context in the organization. At first, they disguised their efforts to design, test, and build microprocessors as efforts to design, test, and build *co*-processors, which were seen in the company as a more legitimate product extension. Later, they packaged the microprocessor memes with the idea that selling microprocessors was a good way of increasing memory sales. What this suggests is that whereas patterns of memetic selection by fit often lead to the repetition of automatic and habitual behaviors and ways of speaking, these patterns also shape conscious attempts to contravene dominant memes. Another way to look at it, however, is that the microprocessor memes effectively used those middle managers to reproduce themselves through the organization.

This meme's-eye view leads us to consider a third motor of selection. Aside from function and fit, some memes may be selected over others for their *form*. That is, the morphology of memetic expression may influence reproductive success. Zander and Kogut (1995), for example, found that the ease with which an idea can be imitated is as important as its effects on whether or not it actually *is* imitated. This suggests the possibility of the sociological equivalent of a tune we cannot get out of our head until we pass it on to someone else, that is, an organizational virus. To take another example, a recent study entitled 'Emotional Selection in Memes: The Case of Urban Legends' (Heath et al. 2001), found that the more disgusting an urban legend (for example, that McDonald's extended its hamburger meat by adding ground earthworms), the more likely that individuals would recall and select this meme for expression to others. The authors conclude that the emotional resonance of a meme (that is, the feeling of disgust) cannot be overlooked when we try to understand which ideas are selected for propagation.

Some memes are also 'self-promoting' in their expression. That is, they tend either to: (a) raise the probability that the individuals who hold them

(their 'hosts') will be in greater contact with other people and thus provide more opportunities for spreading the meme, or (b) raise the probability of positive network externalities so that their hosts will have an interest in proselytizing them. Blackmore (1999: 155–161) argues that the altruism meme (expressed in generous acts toward others at the expense of oneself) may be self-promoting vis-a-vis the selfishness meme, allowing it to spread despite its costs. Her argument proceeds from two assumptions: altruists are more popular, all else being equal, than narcissists and people tend to imitate popular people more than unpopular ones. From these assumptions she deduces that altruists are *more likely to be imitated* and that part of what will be imitated is altruism itself. We may also expect that memes that signal altruism (expressions that make the person *appear* to be kinder and more generous, whether they are or not, such as smiling first at people and ask how they are doing) will spread as well.

In the context of firms, it may be useful to examine management practices and fads in the same way. Since knowledge management systems, for example, are of no use to anyone unless many people express knowledge-sharing behaviors, we might expect those holding knowledge management memes to become proselytizers for them, expending time and energy to convince their colleagues. This is an area where the memetic theory of the firm does not so much integrate existing research, as suggest new avenues of research that may be interesting: considering memes that spread for no better reason than that something about them makes them catchy or sticky (see Gladwell 2000).

Variation

The process of selection always presumes variation. That is, there must be a variety of meme expressions with different combinations of function, fit and form for selection to be more than random choice. The question is how does this variety arise? Where do new memes come from and how do they get into a position to be possible candidates for selection? It is tempting to apply the biological analogy of 'birth' to memes, but it is inappropriate. Biologists do not talk about the birth of genes: they talk instead about the birth (and death) of the organisms that are phenotypic expressions of those genes. Births are important events in biological evolution because they are the realization of the replication of genes subject to the processes of meiosis and mutation, whereby the offspring receive half of their genes from each parent and new genes may be created through copying errors. Abstractly, the birth of an organism thus represents the phenotypic expression of a new combination of existing genes and, possibly, of new genes as well. Though routines or other elements of organizational culture are not born in the same way that an organism is, these same two sources of phenotypic variation, *novel combinations of memes* and *altogether new memes*, still operate.

Let us consider new memes first. As Amabile (1996: 38) notes, assessments of novelty 'must, ultimately, be socially, culturally, and historically bound'. In other words, when we talk of 'new' memes, we need to be clear about the

question: New to whom? The answer in this case is: new to the firm. Thus, we must consider two mechanisms of novelty: *migration*, in which new memes enter the firm from outside; and *mutation*, in which new memes are created through copying errors in replication.

Memes may migrate into the firm either because existing organizational members communicate or imitate inside the organization cultural expressions that they became aware of outside the organization: a guest lecture, an article from *The Economist*, lyrics from a song, a visit to another company to view best practice, a film, a novel, and so on. Alternatively, memes may migrate in because of membership changes in the firm: people are hired or fired, or the firm merges, acquires or allies with another firm. Of course, not all membership changes increase variety. Obviously, *firings* may decrease variety as people take their distinct perspectives with them, but even *hirings* may not increase variation to the extent that firms tend to hire people on the basis of how well they fit the existing culture (as popular management books, such as Collins and Porras (1994), advise) and to the extent that new entrants experience anticipatory socialization, adopting characteristics and beliefs they believe fit the new job (Ibarra 1999). Therefore, it is certainly possible that memetic diversity sometimes decreases over the lifetime of a company (Baron and Kreps 1999: 340–343).

However, in an exhaustive review of workforce diversity, Williams and O'Reilly (1998: 78–79) point out that, at least for the foreseeable future, diversity in North American and European firms is likely to increase on average because of factors such as continued entry of females into the labor force, trends toward increased immigration, aging of the workforce, globalization of firms, and a growing tolerance for different functional and educational backgrounds than have been previously accepted. Clearly, diversity along the dimensions of gender, race, age, nationality, and socio-economic background are not the only sources of memetic variation, but inasmuch as they are associated with different problem-solving perspectives, information stocks, values, and so on, they are significant sources.

It would seem, then, that the number of new memes introduced into firms is huge, providing endless variation. There is an important difference, however, between the *potential* variation and the *realized* variation. This is the difference between the memetic expressions that are available to the senses of members of the firm and those to which attention is actually paid. Exactly because the potential variety of memetic expressions is mind-bogglingly large in this increasingly diverse information age, we erect filters to block out most of them in order to avoid overload. As Hannerz (1992: 32) says:

> 'If there is "information overload" and "information anxiety," it is to a great extent because people cannot confidently enough manage the relationship between the entire cultural inventory and their reasonable personal share in it.'

This anxiety can become debilitating and can lead, as Boisot (1998: 29) poignantly argues, to overly vigilant filtering as we narrow our attention to information in the vicinity of what we already know, strengthening our biases.

Ironically, an increase in the potential memetic variation can lead to a reduction in the realized variation.

It is also important to keep in mind that there is no unequivocal sense in which more variation is 'better' from an evolutionary point of view. Reviewing 40 years of research, Williams and O'Reilly (1998) show that there is no conclusive relationship between diversity and group performance. Though this may be an uncomfortable state of affairs for diversity researchers, the result is completely compatible with evolutionary theory, which does not privilege variation over retention and views them both as grist for selection's mill. As March (1994) maintains, most new ideas are bad ones. Hamel (2001: 66) puts it this way: 'to find one great idea, you must have workers dreaming up thousands'. Anyway, we know from the last section that selection is driven by more than merely functional concerns. That is not to deny that there are things that firms can do to provide what Heath, Larrick, and Klayman (1998) call 'cognitive repairs' and help members adjust to higher levels of potential variation in a way that increases realized variation as well. There is evidence that firms can, for example, extend the absorptive capacity of members through cross-specialization and training (Cohen and Levinthal 1990). Indeed, this may be something that firms do reasonably well compared to markets, as we will discuss when examining why firms may have evolved in the first place. But an evolutionary perspective, and an understanding of the firm as an ecology of memes, should make us a little more humble about predicting unidirectional outcomes between such things as diversity and performance.

The idea that more is not necessarily better also applies to the second mechanism by which new memes may be introduced into the firm: *mutation*. The possibility of copying errors in the processes of externalization of memes and interpretation of their expressions is so high as to be considered the rule rather than the exception by authors such as Sperber (1996: 83). Perfect replication is difficult enough with memes that are expressed with words, and mutations may reflect simple misunderstandings. With memes that are expressed in behaviors, problems are worse. This is because of what Rumelt (1984) calls 'causal ambiguity', that is, the exact actions that need to be undertaken to duplicate the behavior are not often evident from the observation of that behavior. When the behavior in question is an organizational routine combining the actions of many individuals, 'uncertain imitability' is even more likely. Bartlett and Ghoshal (1991) give the example of firms that attempted to copy just the observable characteristics of the 'matrix form' of organizing, but failed to recognize and duplicate the subtle, underlying memetic expressions of compromise and consensus. Not surprisingly, these firms found their matrix structures to work less well than the models they were imitating. Nonaka and Takeuchi (1995: 215–216) describe the lengths to which two teams from a Mitsubishi-Caterpillar joint venture had to go in order to be able to replicate a manufacturing plant in two places. The copying process was complicated in this case by national and organizational cultural differences (that is, differences in the surrounding memes), and required that pairs of key personnel, one from each location, had desks together, ate together, traveled together, spent time visiting each other's homes, and so on.

We will talk more in the next section about how effective replication is achieved in firms, the point here is that variation by mutation of memes is common and needs to be carefully considered in any specific analysis of a firm's evolution.

The final source of variation in firms is meme *recombination* — the way in which new phenotypic effects are created from existing memes. There are two steps involved in this process: the movement of memes around the firm to bring them into a position where they can be combined; and then the recombination itself. The social networks of the firm are an important determinant of the first step. There are many theories (for example, Burt 1992; Ibarra and Andrews 1993; Nahapiet and Ghoshal 1998; Thornton 1999) about how the shape of these networks influences the likelihood of particular ideas coming together in a firm. For example, in his review of social capital research, Burt (2000) argues that actors who span structural holes (that is, maintain non-redundant contacts) are more likely to recognize novel ideas, discern their value, and also possibly direct others (and their memes) into contact. Regarding the second step (the actual recombining), it is probably well established by now that creative leaps are, in essence, the connection of two or more disparate ideas or concepts within the mind of an individual (Simon 1991; Amabile 1996). The French mathematician Henri Poincaré recognized this point long ago, for example, when reflecting on how the finest ideas were generated in the sciences:

> 'They are those which reveal to us unsuspected kinship between other facts, long known, but wrongly believed to be strangers to one another. Amongst chosen combinations the most fertile will often be those formed of elements drawn from domains which are far apart.' (Poincaré 1908)

Feldman (2000) notes that it is not necessary for ideas to migrate through social networks in order for novel combinations to emerge. Changes in meta-memes, in other words, 'new rules or new ways of putting elements together' (Feldman 2000: 624), can lead to purely endogenous recombinations within a single mind. In either case, the intuition that creativity is fundamentally about recombining ideas has gained currency among cognitive scientists, and is now termed 'conceptual integration' or blending and described as a fundamental cognitive process in the generation of novel insights (Fauconnier and Turner 1998). Overall, this notion of variation through recombination is highly compatible with the popular Schumpeterian (1934) view of innovation, which 'consists to a substantial extent of a recombination of conceptual and physical materials that were previously in existence' (Nelson and Winter 1982: 30; see also March and Levitt 1988; Hargadon and Sutton 1997; Galunic and Rodan 1998).

Retention

Retention complements variation. If variation is about new memes and new combinations of memes, retention is about the *longevity*, *fidelity*, and *fecundity* of existing memes: how memes survive and are diffused more or less

unchanged over time. Retention is a sort of back office of the evolutionary process, an essential operation, but one that is out of the limelight because of the greater attention typically paid in organization theory to invention and novelty. As we saw in the last section, however, retention cannot be taken for granted. Without the consistent retracing over and over of the same steps from memes to their phenotypic expression, there is no evolution (only random change) and the firm would not survive (Aldrich 1979: 30–31). In this section, we examine the ways in which the longevity, fidelity and fecundity of memes is achieved in firms.

Take *longevity* first. Biological analogies of life and death do not do us much good when we consider the longevity of memes and their expression in routines and cultural artifacts. Culture persists only through its constant reproduction in individual words and behaviors. In other words, when it comes to memes, longevity is a function of reproduction. This is not about firms producing offspring (although that can happen, see Phillips 2001), nor is it about the duplication or diffusion of skills, routines and other memetic expressions within the firm. We will talk about diffusion in a moment. Rather, it is about reproduction in the sense meant by Giddens (1984: 19) when he talks about structuration. It is about the firm constantly reproducing itself (or failing to do so) through the actions of individuals as they conduct recurring social practices and thereby incorporate and reproduce the constituent rules and ideas of the firm (that is, its memes). In other words, firm structure is not a fixed object, but a constant pattern of routine activity that reproduces the memes that express those routines. When it comes to memetic longevity, perhaps Lewis Carroll's Red Queen said it best when she told Alice, 'Now, here, you see, it takes all the running you can do to keep in the same place.'

Meme longevity may even be assured despite evidence of failure. As Staw and Ross (1987; Ross and Staw 1986) have detailed, the human brain and certain social processes have design features that escalate commitment to an idea despite negative feedback. We have a desire to appear rational and competent, for example, and so we may procrastinate in changing our minds to avoid embarrassment. We have information-processing biases that lead us to seek out, recall, and interpret evidence in a manner that sustains our current beliefs. And, we may cling to those beliefs, though dysfunctional, because of their connection to other beliefs about which we care more deeply.

Fidelity refers to how accurately the memes are copied in their continual reproduction. There is good reason to believe that firms are relatively high-fidelity systems (and, as we shall argue in the next section, that this is one of their key advantages over markets from a meme's-eye view). The defining elements of the firm (its characteristic patterns of control and identity) provide for meme retention. Control in firms means that employees accept to a relatively greater degree than in markets that they may be told how to behave and even how to think. They accept, in other words, reproducing certain memes and not others. The idea that organizations use standard operating procedures and routines to reproduce memes accurately enough to achieve economies of decision-making and implementation dates back to March and

Simon (1958) and has been well developed by Nelson and Winter (1982). Fidelity is enhanced by the automatic, taken-for-granted qualities that memes acquire as their routine expression becomes habitual and considered the right way of doing things. Those memes that become part of the firm's identity become less susceptible to change (Whetten and Godfrey 1998). Being consistent with dominant memes in the firm becomes a selection factor for other memes, which further reinforces fidelity. For example, Karnitschnig (2001) reports on the private Swiss bank Vontobel and three of its young executives who had achieved considerable and widely acknowledged success, but who were, nevertheless, removed from their jobs because of the bank's fear that their ideas presented a challenge to the established sensibilities and 'teamwork' of the firm.

Given the enormous possibilities for mutation in the replication process that we discussed when looking at variation, it may seem contradictory to say now that high levels of fidelity are possible. It is important, though, to distinguish the repetitive expression of memes from attempts to duplicate phenotypic expressions. The difference is analogous to the difference between following a well-known recipe and looking at a cake and trying to make another one just like it from scratch (Blackmore 1999: 61). Variation is possible even when following a recipe, but it is far less likely, and it is in this sense that it can be said that through their repeated invocation, organizational routines 'pass on their information largely intact in successive replications' (Baum and Singh 1994: 4). When reproduction involves not only the same people repeatedly expressing the same memes, but rather the duplication of memes from one mind to another via communication and imitation, a variant of this copy-the-instruction versus copy-the-product distinction becomes important. Fidelity when copying a behavioral meme can be enhanced by the presence of a representation meme: in short, via codification. To the extent that new memes are created whose expression is information about how, exactly, to reproduce the routine or other organizational behavior in question, it is more likely that this underlying routine or behavior will be internalized accurately (see Szulanski 1996).

Fecundity refers to the extent to which a meme is diffused in the firm. Ultimately, patterns of diffusion are explained as much by subsequent selection processes as by retention. Indeed, the three processes of evolution (selection, variation, and retention) are closely linked, and though they are clearly separable analytically, in practice, they strongly influence each other. This raises an issue that is also important to consider at this point: the extent to which a meme's expression is spread and becomes part of the potential variation for selection for an increased number of individuals in the firm depends enormously upon whose mind it currently inhabits. A meme is much more likely to be diffused if it is currently in the head of the chief executive officer (CEO) than if it is in the head of a janitor. This is merely to acknowledge that, because of the control characteristics of firms, there is an asymmetry of cultural influence in organizations: some people have more influence than others. In particular, we need to examine what Hannerz, following Mills, calls the 'cultural apparatus'.

> 'The cultural apparatus includes all those specializations within the division of labor which somehow aim at affecting minds, temporarily or in an enduring fashion; the people and institutions whose main purpose it is to meddle with our consciousness.' (Hannerz 1992: 83)

Hannerz is writing about societies as wholes and has in mind such things as the media, educational institutions, authors, and so on. However, it is no stretch to apply the concept to firms. We *define* firms, in part, as economic collectivities that specifically reserve the right for one group of people (managers) to 'meddle' with the minds of others. The active role of some, and the passivity of others, in shaping meaning is an important assumption in both classic (Barnard 1938; Selznick 1957) and contemporary (Simon 1991; Conner and Prahalad 1996) work on firms. Indeed, it is represented as the explicit purpose of senior leaders in popular texts on management (for example, Ghoshal and Bartlett 1997: 215). The influence of the cultural apparatus in firms is powerful, but never certain. Organizational authority alone is not enough to ensure that particular memes are accurately spread through the firm, as any CEO who has tried to manage organizational culture will confirm. Cultural influence depends not only on authority, but also on network positioning, rhetorical skills (that is, skills associated with packaging some memes with others, as with Burgelman's middle managers at Intel) and so on.

This sort of consideration is important to an evolutionary theory of the firm because Perrow (1986) is right to criticize the lack of a consideration of power in most evolutionary approaches. Power matters. Nothing we have said so far suggests that specific individuals (or groups) will not benefit (and actively seek to benefit, using their roles and traits) from the evolutionary process — certainly, memes tend to survive and propagate where they benefit their vehicles. Indeed, our discussion of meme selection also incorporates human agency. Nonetheless, we are careful to point out the ways in which agency, though important in the way that it shapes evolution, is not decisive.

We have tried to outline a meme's-eye view of the firm to provide a better account of how firms evolve by building on the work of previous evolutionary theorists and integrating what we know from other approaches about organizational behavior. Clearly, there is more work to be done along these lines, and what we can present here is merely an opening for a discussion, not its fulfillment. We want to shift our attention now, though, from the question of what firms are to the second question posed by any theory of the firm: Why do firms exist?

Why Do Firms Exist?

From the point of view of a cultural theory of the firm, the question of why firms exist is best understood as: Why has the cultural evolution process led to a situation where memes bundle together as firms? The answer to this must come in the form of an explanation of why bundling in this way (in structures characterized by particular patterns of identity and control) offers a survival advantage to memes. It must explain, in other words, why memes that are a

part of firms tend to replicate more often than similar memes that are not a part of firms. The explanation that emerges will not be completely independent of the functionalist question that animates economic theories of the firm: What advantage do firms offer the human beings that are part of them? As we have seen, memes are often selected because of the beneficial effects they have for those who enact them. But we have also seen that they are selected for numerous other reasons, and a theory of the cultural evolution of the firm allows us, indeed forces us, to look more broadly.

A cultural and evolutionary theory also forces us to recognize that the reasons firms came into existence are not necessarily the reasons this form persists now. Path dependence is important: in the roughly 150 years since their origin, firms have increasingly come to shape the environment and to do so in a way, not surprisingly, that favors the perpetuation of the bundle of memes whose expression is the idea of the modern firm itself. Thus, there are two separate questions that we must consider: the question of the historical origins of the evolution of the firm and the question of the persistence of the firm form today. We know from institutional theory that these two questions seldom have the same answer (Fligstein 1985). Unfortunately, however, existing theories of the firm are typically ahistorical, addressing only the second question and implicitly assuming firms are timeless and unchanging, and that their advantages can be logically deduced from first principles, rather than needing to be discovered empirically and historically. They assume that the question 'Why do firms exist?' can be reduced to 'Why do firms persist?' In the sections that follow, we sketch an outline of what a more rounded explanation would look like.

Origins

The study of origins is necessarily historical. In his justly famous historical surveys of American business, Chandler (1962; 1977) suggests that the firm emerged at a specific point in history and for reasons that appear sharper and more poignant without modern-day taken-for-grantedness. Chandler's analysis lacks a global scope as he is focused entirely on the American case. This is a serious limitation. However, given the evidence that similar trends as were found in America, though at different times, were present in several western European countries, and given the richness of Chandler's data, his work provides a useful starting point for the study of the origin of the firm structure.

According to Chandler (1977: 17), the basic business unit prior to the 1840s was the small, family-run enterprise. These enterprises were highly specialized. The rapid growth in the economy from 1790 to 1840 led to increases in the number of enterprises, but not to an increase in their size or administrative sophistication. They 'relied entirely on commercial practices and procedures invented and perfected centuries earlier by British, Dutch, and Italian merchants' (Chandler 1977: 16). There were no managerial hierarchies and no integration of business functions or areas into one firm, that is, neither the characteristics of control or identity characterizing firm organization

(Chandler 1977: 36–37). Chandler argues that this was largely because the production and movement of goods still relied upon traditional sources of energy (wind and animal power), which greatly limited the velocity of throughput of any single business. Therefore, 'the volume of business an individual enterprise was called to handle was not extensive enough to bring either subdivision within the firm or the internalization of several small units within a larger enterprise' (Chandler 1977: 49).

The move from these traditional enterprises that used the market to coordinate owner-directed production processes to firms that employed professional managers and administrative coordination occurred with the advent of steam and coal power, rail travel, and the telegraph. Why? The answer has to do with complexity. These new technologies, especially the railroads, opened new markets, but more significantly, they created the possibility for new production technologies with an enormous potential for increased *throughput*. As Chandler (1977: 236) puts it, the important 'economies of scale and distribution were not those of size but of speed'. To utilize these technologies to their full required the absorption and maintenance of a large amount of new knowledge. Knowledge about new energy sources and production technologies was essential to capture the gains in throughput, while at the same time, rapid growth in knowledge was also required about how to distribute effectively these larger volumes of products and how to procure correspondingly large quantities of supplies (Chandler 1977: 281). For the first time, there became too much for any one owner or director to know to run his business effectively. It became impossible for any single person to retain, with sufficient fidelity, the memes for all this new information and these new practices and to ensure effective coordination in their eventual expression in organizational behavior.

Chandler (1977: 287) also points out that no existing third-party suppliers or distributors, which were typically primitive single-agent operations at that time, were up to the task of adequately developing and sustaining these new technologies. In order for the gains of new production ideas to be realized (that is, for these memes to survive), they needed to be bundled with new ideas in distribution and procurement. This is because it would hardly be worthwhile to expand production throughputs dramatically without simultaneous advances in distribution and procurement. What emerged were advances in coordination and a move toward administrative specialization. Chandler (1977: 236) writes that this 'could be achieved only by creating an administrative hierarchy operated by many full-time salaried managers'. In this way, a vehicle was created to retain these specialized memes of production, distribution, and procurement as well as to coordinate their eventual enactment as work routines. This vehicle was the firm, with its hierarchical control of employees by managers who identified with the firm. From a meme's-eye view, we would say that these memes produced cultural effects with a tremendous functional selection advantage, but they did so only when bundled with each other. This bundling was made possible by the enacted identity and control memes of the firm. Thus, together, both sets of memes flourished.

In evolutionary terms, this pattern is to be expected. Through bundling, replicators can combine in ways that produce more complex expressions that

are better able to compete for resources (such as human attention in the case of memes), but this bundling requires some apparatus to be possible. In our case, this apparatus consists of the memes that enact the firm. In the case of biology, it consists of the identity genes and interpreting genes whose function it is to coordinate the development of the organism (see Coen 1999). In addition, we expect this bundling to be hierarchically structured. This is because evolved structures are almost invariably hierarchical. Dawkins cites Simon's (1962) essay on the logic of complexity to argue why this is. It is due to the fact that in every generation those replicators with the most advantageous variations will be those selected. Any evolving structure, therefore, must be functional every step of the way, and each intermediate must be superior to its predecessor. This is a considerable restraint. Dawkins (1982: 251) notes:

> 'The evolution of statistically improbable assemblies proceeds more rapidly if there is a succession of intermediate stable sub-assemblies. Since the argument can be applied to each sub-assembly, it follows that highly complex systems which exist in the world are likely to have a hierarchical architecture.'

For evolved structures, then, we expect increases in complexity to occur through the hierarchical bundling of replicators achieved through the apparatus of some vehicle — the firm or the organism, for example.

So firms emerged as evolved structures capable of better competing for resources because of their increased complexity, that is, because they enabled the retention of bundles of production, distribution, and procurement memes. Firms enhanced the possibilities of faithful replication and enactment of these memes. In other words, they reduced variation. This is an important point. The memes that have survived over time are precisely those that have been retained; they are those most likely to be replicated with fidelity. Though variation is necessary for evolution, natural selection favors evolution in the direction of zero mutation (Williams 1966; Dawkins 1982).

Persistence

Once the bundle of memes we call the firm had emerged, the logic of its evolution changed somewhat and the possibility of group selection emerged. The fate of these individual memes now depended upon what happened to them individually, but also upon what happened to them as a bundle. High retention is good for the individual memes, but if zero variation were ever reached, the firm would stop adapting and would therefore be more likely to fail, thus harming the prospects of all of its memes in the process. There is always a balance in any evolving system between the longevity offered by retention at the level of the individual meme and for adaptation at the level of the bundle of memes. The firm emerged because of the reproductive advantages it gave memes, but it persisted because it was also able to provide more effective variation and selection processes. Specialization and professional management allowed not only higher fidelity retention, but also, eventually, the rapid spread and refinement of new administrative techniques (Chandler 1977: 456). Thus,

the reasons for the origin of the firm are different and more narrow than the reasons for its persistence once it appeared on the scene. To explain the continued persistence of firms, we need to look at the advantages of retention, variation, and selection they offer memes.

Retention

Still today, the most important advantages firms offer memes are of retention. These advantages are the result of two things. First are the control structures in the firm, whereby people can be told what to do and even what to think, that enable memes to be more easily diffused with fecundity and fidelity. Second is the identity that employees develop toward their firms, which leads them to hold certain memes deeply and defend them against challenge. Control and identity come together in firms by virtue of the legitimacy granted generally by society and specifically by employees to managers of firms to impose and manipulate corporate culture and thus the assumptions, beliefs, values, and roles internalized by employees and enacted by them not only in the organization (when management may be looking to ensure displays of compliance), but outside as well.

Without very much exaggeration we might say that firms are systems of contractual docility. They are structures that ensure, for the most part, that members find it in their self-interest to be tractable, manageable and, above all, *teachable*. It is often said that knowledge is power, but sometimes the power comes from imposing knowledge on someone else rather than taking it from them. As Hannerz (1992: 104) notes, ideas have a peculiar economy:

> 'When you can give ideas away and retain them at the same time, you can afford to be generous. In contrast, it is less easy to maintain allegiance to any number of contradictory ideas, and especially to act in line with all of them. Thus, if somebody accepts your ideas and therefore has to discard or reject competing ideas, in belief or in action, he may really be more generous than you are as the donor.'

In other words, we tend to protect our memes from challenge. Of course we do so: we are the product of those memes. This is why learning is so often threatening to the adult mind. However, the control and identity characteristics of firms change this economy, as Simon (1991: 35) argues:

> 'The argument is not that people are totally docile, nor that they are totally selfish, but that fitness calls for a measured but substantial responsiveness to social influence. In some contexts, this responsiveness implies motivation to learn or imitate; in other contexts, a willingness to obey or conform. From an evolutionary standpoint, having a considerable measure of docility is not altruism but enlightened selfishness.'

Firms have a dedicated managerial resource responsible for checking, testing, and ensuring high-fidelity reproduction (Williamson 1975). What is more, the presence of a sometimes elaborate set of idioms and jargon that create a firm-specific language (Kogut and Zander 1996) makes high-fidelity reproduction easier. In these ways, firms facilitate the retention of memes in the minds of their members.

As we have argued throughout this article, though, firms are more than structures of authority, they are institutions that also provide a sense of

identity for members. Barnard (1938) and his intellectual descendant Selznick (1949; 1957) were the first scholars to characterize business organizations as institutions, that is, to argue that firms are more than merely tools, that over time they come to take on a life of their own (Selznick 1949: 10). Articulating what it means for a firm to have a life of its own has produced several branches of institutional thought (Scott 1987). However, at its core, the so-called 'old' institutional perspective holds two things: (1) human actors are susceptible to merging their identity with that of the firm, effectively opening up their minds to receive the memes of the organization; and (2) to be an institution presupposes some stable core memes (for example, values, visions, and assumptions) as attractors for social union. The first view recognizes that humans are powerfully drawn to collective enterprise, not only from a self-preserving need to cooperate (Axelrod 1997), but from a natural tendency to seek some moral order and adopt it as their own, a thesis well developed by Durkheim (1984) and Weber (1978). This is the sense in which firms have us as much as we have them: they socialize us, fill our heads with their memes, which shape our sense of identity and which we carry, reproduce, and defend outside the organization as well as inside.

Of course, this is not to imply that *only* firms provide this combination of meme-benefiting control and identity. Professional associations do as well, for example, and where such alternative loci of identity and control exist, we may expect to find an ongoing competition within the minds of individuals who intersect the two cultures between memes from each. Firms, however, have evolved to become particularly powerful vehicles for the retention of memes, through, for example: the fact of an employment contract that effectively binds fortunes and demarcates enemies; the presence of managerially assigned monetary incentives and career progression that motivate the display of adherence to corporate memes; and, not least, the power of leaders to sanction and select out actors who do not abide by corporate values. On the last point, Barnard (1938: 279) goes further, specifically assigning to executives the task of diffusing core memes:

> 'The distinguishing mark of the executive responsibility is that it requires not merely conformance to a complex code of morals but also the creation of moral codes for others . . . . This is the process of inculcating points of view, fundamental attitudes, loyalties, to the organization or cooperative system, and to the system of objective authority, that will result in subordinating individual interest and the minor dictates of personal codes to the good of the cooperative whole.'

As mentioned above, this admonition is echoed in modern management texts, such as Ghoshal and Bartlett (1997: 215). From its origins as a necessary side-effect of the managerial function, the preservation and replication of core memes has become an explicit part of the role of leaders in firms.

Selection and Variation

Important as the retention advantages of firms are, these bundles of memes would not have achieved the complex adaptations required for them to progress through evolutionary time without accompanying advantages of

variation and selection. Firms offer two sorts of selection and variation advantages. First, they offer a context that places potentially complementary memes in closer proximity than is typical in markets. This is not simply a case of putting people with different memes geographically nearer each other. It is a matter, as the knowledge-based view would argue, of reducing knowledge-based transaction costs. Moran and Ghoshal (1999: 402), for example, argue that the advantage of organizations is that they can motivate their members to share knowledge and take action in firm-benefiting ways. In markets, exchanges of knowledge will typically only occur where there is clear mutual benefit. Organizations, however, can induce, compensate or coerce individuals to exchange knowledge when it may result in new combinations of memes that benefit the firm but not the individuals involved.

The study of the conditions under which individuals may do or say things that are harmful to themselves but beneficial to a group of which they are a member is an area where evolutionary biology is increasingly trying to tread and one where a theory of cultural evolution may be able to inform the theory of biological evolution rather than the other way around. Sober and Wilson (1998: 146), for example, argue that group selection effects in biology may be able to explain what they call the amplification of altruism. They note that some human groups are able to enforce, at relatively low cost, norms of behavior among their members in ways that have relatively high benefits for the group. The bestowal of status on individuals who perform altruistic acts, for example, or the ostracism of individuals who act selfishly. Groups that develop these norms will prosper, thus benefiting all individuals sufficiently to outweigh the costs to individuals of enforcing these norms. What Sober and Wilson leave exogenous to their theory is any explanation of why some groups are able to achieve this and others are not. They treat it as the result of random variation. We would say that what they are observing is the result of the control and identity characteristics of cultural entities such as firms. What they see as purely the result of biological evolution through group selection of genes can, we claim, be better analyzed as the result of cultural evolution through the selection of memes.

The second advantage of firms for the variation and selection of memes is that they employ professional managers who are hierarchically motivated and made specifically responsible for the task of recombining those memes in a coordinated manner and for creating and enforcing novel administrative practices. This is the complement to Barnard's admonition to institutional leaders quoted above. Managers may be assigned roles that include increasing the variation and improving the selection of memes. Heath et al. (1998), for example, describe how organizational practices can help overcome basic human biases in selection processes and therefore improve the effectiveness of organizational members in guiding the evolution of memes vis-a-vis individuals acting independently in a market. For example, they discuss the evidence that individuals collect only a *small* sample of information before making a selection among behaviors to express because they systematically underestimate the benefits of *larger* samples.

> 'At the extreme, individuals may not collect any information from the external environment because they believe that they already have adequate information stored in their head. Organizations, may overcome this tendency by encouraging or requiring individuals to collect larger samples.' (Heath et al. 1998: 12)

They note that this kind of repair is central to successful total quality management programs, in which employees are instructed to talk with data and facts.

Part of the elegance of an evolutionary approach is the emphasis it places both on retention and on variation — the natural balance it presumes between exploration and exploitation (March 1991). Moran and Ghoshal (1999), and other representatives of the knowledge-based view, are correct that firms have an advantage over markets as superior explorers of design space and thus are better able to create variation through novel recombinations of memes. Firms have memetic variation and selection advantages. But firms are able to make use of that advantage only because of their enhanced ability to exploit those new combinations by diffusing and operationalizing them with fidelity — because of their advantages in retaining memes. These advantages should not be overlooked. The whole point of exploration is exploitation.

Conclusion

In this article, we have proposed a theory of the cultural evolution of the firm. We argue that firms are best thought of as cultures, as social distributions of modes of thought and forms of externalization. Using the term 'meme' to refer collectively to cultural modes of thought (ideas, beliefs, assumptions, values, interpretative schema, and know-how), we describe cultures as social phenomena, as patterns of symbolic communication and behavior that are produced as members of the group enact the memes they have acquired as part of the culture. Memes spread from mind to mind as they are enacted and the resulting cultural patterns are observed and interpreted by others. The uncertainties of interpretation and the possibilities of reinterpretation and recontextualization create variation in the memes as they spread. Over time, firms evolve as a process of the selection, variation, and retention of memes. Our claim is that understanding firms in this way provides a new perspective (which we call the 'meme's-eye view') on the question of why we have the firms that we have and makes possible a genuinely descriptive, as opposed to normative, theory of the firm.

The result is a theory of the firm that captures certain insights of the transaction cost and knowledge-based views, while avoiding their most egregious assumption: functionalism. A theory of the cultural evolution of the firm recognizes that firms are more than merely tools at our disposal — firms have us as much as we have them. Firms are produced as the result of intentional human action, but they are not the intended product of that action. The meme's-eye view respects the importance of human agency while also reflecting the importance of unconscious processes and unintended consequences. It forces us to consider that we have the firms we do because

these memes have been able to replicate over time and others have not. Sometimes memes are able to replicate because of the beneficial effects they have on the welfare of the firm, but not always. We have examined many other reasons why memes may persist and spread, and an important benefit of the theory is that it is able to explain 'organizational foolishness' (March 1976) much better than existing theories of the firm. It postulates that firms have evolved not because they are necessarily good for society or good for their members (though often they are both), but fundamentally because they are good ways for memes to replicate themselves.

As we see it, there are two purposes that motivate the development of a theory of the firm. The first is to provide a robust explanation of the origins and persistence of the firm structure. Using Chandler's historical data, we have been able to outline such an explanation from a meme's-eye view and to show that though firms emerged as vehicles to facilitate the *retention* of memes, they have evolved to provide *selection* and *variation* advantages that explain why they persist today.

The second, and perhaps more important, purpose of a theory of the firm is to provide a general framework for understanding what firms are and how they develop that can serve as an infrastructure allowing for the loose coupling of the too often disparate elements of our multidisciplinary field. We have tried to show that a theory of the cultural evolution of the firm does not displace existing theories, but rather, serves as a platform from which those theories can be interpreted and reinterpreted. In examining the mechanisms of selection, variation, and retention of memes, we have suggested ways in which existing studies may be brought together in novel ways with potentially fruitful consequences.

This is a grand ambition and it is perhaps enough that a theory of the cultural evolution of the firm sheds light on problems closer to its intellectual homes of evolutionary theories of organizations and cultural theories of organizations. We would argue that evolutionary theories of organization have suffered from the lack of identification of a genuine replicator as the unit of selection. For this reason, the meme concept is very useful. Building on the work done in the area of intra-organizational ecology, it allows for the development of a general theory of the evolution of organizations by natural selection. We would argue that cultural theories of organization have had limited success in conceptualizing what Martin (1992) calls the fragmentation of culture in organizations, the fact that organizations are not monolithic and culture is unevenly distributed across them, and even less success in explaining how organizational culture changes over time. The concept of the meme and the distinction between cultural modes of thought and their forms of externalization allow for application of an evolutionary algorithm to culture that can help us analyze patterns of fragmentation and change without losing sight of the principle that culture is fundamentally a social phenomenon.

Lastly, this article contributes to the growing interdisciplinary body of literature about memes and the evolution of culture and seeks to introduce this increasingly prominent perspective to the field of organization studies. We believe that the possibilities for a deeper understanding of firms by

considering them as cultures that evolve are exciting. They extend much further than a single article can encompass and much more work is needed. We hope this article will encourage others to continue the process of discovery.

Note

This article benefited from the helpful comments and advice of Howard Aldrich, Joel Baum, Tom D'Aunno, Herminia Ibarra, Peter Murmann, Andrew Pettigrew, José Santos, Pat Thornton, John Van Maanen, Deanna Weeks, and the session participants of the Academy of Management, American Sociological Association, and Strategic Management Society meetings.

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