A STOCHASTIC MODEL OF EMERGENT ORGANIZATIONAL LEARNING: ORGANIZATIONAL CULTURE AS A DISTRIBUTED SELF-REPRESENTATION

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A STOCHASTIC MODEL OF EMERGENT ORGANIZATIONAL LEARNING:
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Abstract

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A model is developed that describes organizational learning at the organizational level rather than as an aggregate of individuals’ learning. Following Cook and Yanow (1993), organizational culture, rather than cognition, is the medium of organizational learning. Because organizational culture is usually defined in terms of “sharing”, which is ambiguous as to level, the level of analysis for organizational culture and learning remains uncertain. Process emergence is proposed as a dynamic explanation for the relationship between the individual and group levels. This explanation takes into account the emergence of the group from the individual level and the part-whole relationship between levels. An emergent level is an autonomous process that learns. Three criteria for process emergence, of which the emergence of the group level is an example, are developed based on Bateson’s (1979) work on mind. The group emergent level is described as an autonomous process produced in the interaction of processes at the individual level. Stochastic process is proposed to model how process emergence can occur. Stochastic process, of which biological evolution is an example, is defined in terms of selection by consequences. Models of cognition based on stochastic process are adapted to the process emergence of the group level from the individual level. The distributed self-representation (DSR) model is offered, which is based on the stochastic
interaction of components of a distributed self-representation of the organization. As representations held by individuals interact and differentially endure, the population of these representations (the organizational culture) evolves (learns) analogously to biological evolution. Cook and Yanow’s case is re-examined to elaborate the DSR model as an explanation of learning by an organizational culture. Several areas of implications are developed. A new perspective on the emergent group level allows better understanding of the homogeneity and diversity within an organizational culture, and sheds light on the group level aspects of autonomy and leadership. Strategies for intervention at the organizational level as well as configurationist models for understanding the group level are supported. The risks of Cultural Taylorism, wherein management takes exclusive responsibility for organizational culture and learning, are discussed.
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Introduction

The goal of this dissertation is to develop a new way of conceptualizing organizational learning that addresses the phenomenon at the organizational level specifically. Organizational learning is an achievement of an organization, not simply the organization’s individual members. Seeing organizational learning at the organizational level is possible by seeing it as a function of organizational culture (Cook & Yanow, 1993). Organizational culture helps to focus on the organizational level and offers a broader model for how organizational learning may occur. It avoids some of the difficulties Cook and Yanow find in “cognitive” approaches to organizational learning. Ultimately this may produce some understanding of the relationship between the individual and organizational levels.

Conceptual difficulties surround level of analysis issues in the study of both organizational learning and organizational culture. Collective behavior (McPhail, 1989), of which organizational level learning is an example, remains a little understood phenomenon. By looking at organizational learning as emergent at the organizational level, we come to understand the dynamics of emergence and develop a model that might explain how organizational learning occurs. This has important theoretical implications for how we conceptualize organizational learning, and for the accumulation and application of knowledge about how we intervene at the organizational level.

In the argument that follows there are three main parts corresponding to the first three chapters of the dissertation. Chapter I is to show that organizational learning is indeed an organizational level phenomenon. Cook and Yanow (1993) have made some headway in this area by showing that organizational learning is a process of organizational culture and that it must occur at the organizational level. Yet, our conception of organizational culture as something “shared” hides critical issues within
the ambiguity of the word “shared.” Sharing seems to refer to both the individual and group levels at different times. I will discuss three ways in which the individual and group levels have been related previously and I will propose a fourth based on what I will call “process emergence.” A process emergence based model will provide a framework for better understanding sharing in terms of the two levels involved.

In Chapter II, I want to discuss the way in which the emergence of the organizational level occurs. I present three criteria that indicate when emergence is happening. The first criterion of emergence—as is suggested in the phrase “process emergence”—is that emergence must occur between processes, not between things. Secondly, any plausible mechanism must explain how feedback occurs. The model must account for circular/iterative processes where the consequences of one process cycle impact the beginning of future cycles of the process. Thirdly, emergence requires “part-for-whole coding” (Bateson, 1979)—the whole is represented in the parts. This allows for the circular/iterative feedback described above.

In Chapter III, I will develop a specific model—the distributed self-representation (DSR) model—taking the preceding discussion into account to show how the emergence of organizational learning occurs. This will rely on adapting Gregory Bateson’s cybernetic approach in order to model organizational culture. In Chapter IV I will apply the DSR model to an existing case study and discuss some specific implications of the model. Chapter V will discuss some more general implications of the DSR model.
Chapter I: Why The Organizational Level?

The “learning organization” has come onto the management scene in this decade as a promising new way to design organizations. The idea of an organization being able to learn is indeed intriguing. The contrary, an organization unable to learn, is manifestly at peril. However, our ability to understand the learning organization is hampered by the difficulty in defining it. In Senge’s 1990 *The Fifth Discipline*, the learning organization is described in terms of five “disciplines”. These might be thought of as five management technologies that when applied together constitute a distinct organizational form. They are: personal mastery, mental models, shared vision, team learning and systems thinking. Senge acknowledges that none of these disciplines are new, but their application together creates new possibilities.

It seems plausible that these disciplines would reinforce each other and that their integrated application might constitute an organizational form. Yet, why this new form should be called a “learning organization” is less clear. The learning organization is defined primarily in terms of the integration of the five disciplines. Beyond that, the significance of the term “learning organization” is more diffuse. The applicability of the term “learning organization” is described in several different ways.

One facet of the learning organization is the ability to understand itself and its environment so that it can change rapidly to meet new circumstances. De Geus (1988) defines “institutional learning” as “the process whereby management teams change their shared mental models of their company, their markets, and their competitors” (p. 70). By adjusting a shared mental model, a learning organization (or institution) is able to adapt to new situations. Hence, de Geus thinks of organizational learning as a kind of strategic planning, based on “scenarios” (see Schwartz, 1991) and “playing” with mental models,
including computer simulations. Strategic planning becomes a creative imagining about possible futures so that an organization can quickly adapt.

A related aspect of organizational learning is helping managers take in a broader perspective in their decision making. Senge’s (1990) fifth discipline is “systems thinking”, by which managers are able to see hidden “structures” or patterns of systematic causes that bind them. By “seeing the forest and the trees” managers are able to free themselves from harmful cycles of causes of which they were previously unaware. Organizational learning is a kind of reflection that is lost when managers look only to the “trees” of their organization.

Both the strategic planning and systems thinking aspects of organizational learning require managers to be more open to new ways of looking at situations and to question old assumptions. Such a process of examining mental models requires a degree of openness not common in organizations. This brings in another aspect of the learning organization: that it allows for and encourages these kinds of explorations. Hence Senge devotes attention to what he calls organizational “learning disabilities”. Some of these are still due to poor conceptualization of a situation, for which the remedy is more effective mental models or better systems thinking. However, there are also some learning disabilities attributable to group dynamics that inhibit learning. Individual managers keen on learning still require an organizational culture that supports it. To address these learning disabilities requires looking to the group level.

By looking at the group level, an organization can address issues that interfere with the openness required for organizational learning. This appreciation of the group level implies an innovation in management style (Stata, 1989). The learning organization therefore includes ideas about how people in the organization are in relationship to each other. For example, Senge suggests that the learning organization should be contrasted with the “controlling organization” (Senge, 1990, p. 5). It is not about “the top thinking
and the bottom acting” (p. 288). Instead, an openness of communication and mutual exploration of assumptions is encouraged. The learning organization is more participative. Organizational learning follows in the organizational development tradition of flatter, less authoritarian structures, which allow managers to engage in a learning process.

There is another way in which organizational learning is a group level phenomenon. Two of the five disciplines—team learning and shared vision—are “inherently collective” (Senge, 1990, p. 375). They require a “team” and “sharing”. It appears that these disciplines are not just about facilitating individual learning but involve learning that occurs at the group or organizational level. Is there a way in which organizational learning implies that learning occurs at the organizational level? Does the organization itself—not just individuals in it—learn? This is the central question of this dissertation, to understand how organizational level learning might occur.

One way to attempt this is to look at organizational learning as a function of organizational culture. This follows a model of organizational learning based on organizational culture developed by Cook and Yanow (1993). Because it focuses attention on the organizational level, organizational culture is a particularly good way to think about organizational learning. Cook and Yanow contrast their “cultural” model with two ways in which a “cognitive” model has been applied to organizations.

The first of these cognitive models looks at “how individuals learn in organizational contexts.” This common approach to organizational learning is currently widely applied. For example, Senge (1990) represents this kind of learning even as he protests that he is referring to organizational level phenomena. Senge quotes Bohm’s description of dialogue, where…

A new kind of mind begins to come into being which is based on the development of a common meaning…People are no longer primarily in opposition, nor can they be said to
be interacting, rather they are participating in this pool of common meaning. (Senge, 1990, p. 241)

Yet, at the same time that he describes collective thought, Senge focuses predominantly on individual cognition within the organization. In his chapter on “personal mastery” he claims that “organizations learn only through individuals who learn” (p. 139), and then proceeds to describe the process by which individuals master learning. In the next chapter, “mental models” are seen as beliefs and assumptions held by individuals. “Shared visions” of the next chapter “emerge from personal visions” (p. 211) and require personal “enrollment” (p. 219). The chapter on “team learning” does point to group level learning, but without much detail about how it occurs. He makes particularly good use of Bohm’s ideas, but then he seems to revert to discussing the individual level. What could Senge mean when he says that “individuals gain insights that simply could not be achieved individually” (p. 241)? I suspect that Senge means that a group process leads to individual insight. He does not clearly address when individual processes might lead to group or organizational level learning.

Individual cognition predominates this conception of organizational learning. When there is concession of a group level phenomenon, it is insufficiently explained and largely derivative of individual cognition. There are, however, others who have taken on the idea of group level learning more directly. This is reflected in the second cognitive model described by Cook and Yanow (1993, p. 374), that treats organizations “as if they were individuals.” Morgan (1986) reviews this type of approach as an application of a “brain” metaphor.

Cook and Yanow outline three major difficulties with this “brain” approach to organizational learning. First, it is not clear how organizations are at all cognitive. They are not individuals and there is no reason why they should be able to learn like individuals. It makes sense to look at brain function when looking at cognition in individuals, but it is not clear that one would look at the same sorts of things in an
organization. Secondly, Cook and Yanow point out, ideas about learning in the field of individual cognition are substantially in flux and do not provide a steady platform from which to launch off towards explaining organizational learning. Finally, it is not certain even with a clear model of individual learning that we could apply it to organizations unmodified. How can we assume that organizations learn the same kinds of things and in the same kinds of ways as individuals? Those kinds of conjectures seem premature. A cognitive model of organizational learning is best kept at a metaphorical level until some of these issues can be sorted out.

Though Cook and Yanow want to avoid postulating a brain-like “cognitive entity” at the group level, they certainly do want to describe a learning that occurs at that level. In some ways, that is similar to what I am doing here. Naturally the word “entity” brings up questions of the ontological status of such a thing. (I will deal in depth with the question of organizations as “things” later on.) Cook and Yanow suggest an alternative way to discuss learning at the organizational level. By basing their concept of organizational learning on organizational culture they insure that we address an organizational level phenomenon. This also allows organizational learning to be studied as a distinct phenomenon, rather than a special case of cognition. Organizational culture seems to be a strong conceptual candidate for how learning could occur at the organizational level.

A problem with this approach, which Cook and Yanow note, is that organizational culture has its own issues and ambiguities about being an individual or organizational level phenomenon. Our most common definitions of organizational culture are based on the idea of sharing (Golden, 1992). These definitions of organizational culture in terms of sharing are plausible because they seem to bridge the two levels of analysis implicit in the idea of organizational culture. Sharing implies the idea that culture exists at a level
beyond individuals: that culture relates to more than one person. On the other hand, organizational culture seems to be based on activities that corporeal individuals do, such as making assumptions, having and applying values, using problem solving approaches, etc. “Sharing” bridges between the two levels of phenomena because it addresses both the individual level phenomena of culture (such as assuming, valuing, problem solving) and the organizational or collective level of shared assumptions, shared values, and shared problem solving approaches.

There is a possibility that the idea of “sharing” can operate as a bridge between the two levels, but it may also mask dynamics between the two levels. When we say organizational culture is “sharing” we certainly mean more than that two or more people have the same of something. Being alike in some respect does not imply a shared culture. It certainly means something different to say that two individuals have similar cultures than to say that two organizations share the same culture. Even if they theoretically had identical cultures, that would be quite different from having the same culture. The latter case would imply that they must both be part of something larger. They belong to the same culture. This is more than sharing a quality.

A shared organizational culture suggests “an entity” that takes on a life of its own. People belong to a culture. It is more than a generalization about or a classification of the individuals in an organization. It is a relationship between people. It is a description of the organization itself—at the organizational level. “Sharing” suggests the identity of the organization. The significance of organizational culture will certainly be lost if it is restricted to the sense of sharing as sharing a quality or similarity across an organization.

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1 I will use the terms “cultural”, “organizational”, “group” or “collective” levels interchangeably, since I will treat the basic dynamics as equivalent. I grant that there may be significant differences between the terms in many other respects.
Cole (1991) discussed the confounding ambiguity in the word “sharing” in speaking of socially shared cognition. Cole notes this fundamental ambiguity in the word “shared”: “[S]haring often means both ‘having in common’ and ‘dividing up’ at the same time.” (p. 398). “Having in common” sharing is when shared meanings or understandings are accessible to members of some group as “tools” that they can use. This “having in common” sharing implies a group level resource—available to that group as a part of membership. The causal vector is from the group level to the individuals. “Dividing up” sharing is the other side of the coin. This is sharing where members of a group each contribute individually to the group. Cole describes it as a division of cognitive labor. Here a group task is accomplished by using the various skills of its members. Each contributes a part to the task, though no individual can be said to be responsible for the result alone. In this type of sharing, the individual helps the group accomplish a task, rather than the group supplying the individual with a resource. The causal vector is from individual to group.

As an example of these two causal vectors, imagine a company at a point of crisis. A manager, named Jerry, is frustrated by his company’s inability to do what he feels needs to be done. In response, he finally takes his own initiative to resolve the problem. Perhaps fortuitously, Jerry is successful. Because of his surprising success, his action is not met with the criticism it might usually have received but is recognized and rewarded publicly. Something new has happened. Jerry’s action has contributed to the organizational culture. We might call Jerry’s contribution an encouragement of entrepreneurial spirit. If this act is of sufficient magnitude, or if there are many similar successes by emulators, entrepreneurial spirit will be added as a part of this culture. The addition of entrepreneurial spirit to the culture comes from the individual efforts of this particular member. In Cole’s terms, Jerry has contributed to the “divided up” cognitive labor of the company and through his individual effort he has helped prepare his company to solve future problems.
From the other end, however, we can now see how this value on entrepreneurial spirit becomes a resource for members of the organization. Maryl, who joins the company years later, is similarly frustrated by a project she is working on. Her co-workers recommend that she take action herself, and they cite the story about Jerry’s entrepreneurial efforts. In this case, entrepreneurial spirit is a resource that Maryl draws upon. She does not get this from Jerry per se, but from the culture. This resource is something that she “has together” with members of the culture.

Sharing in this example is both a “division of cognitive labor” and a “having together” of a cultural resource. If sharing has both of these meanings, what level of phenomenon is it? Is it something being created by the cooperative contributions of its many members? Is it a synergy of accomplishments originating in individuals which consequently affects “the group”? Or conversely, is organizational culture something outside of individuals which influences them and which they can access as a resource? That is to say, is its origin a group level phenomenon? The causal vector can point either or both ways.

This ambiguity captures a reciprocal relationship that is probably true. The individual and group levels involve causality in both directions. But the use of “sharing” as a central concept to understand organizational culture will obscure which part of the equation we are dealing with at a particular moment. It will obscure the relationship between activities of individuals and the emergent group or organizational level. By unraveling the ambiguity about levels of analysis and the connection between levels, we can hope to gain powerful insight into the nature of organizational culture and organizational learning.
Asch’s Two Idealized Poles

Given that sharing contains two meanings—one related to origins on the individual level, the other to origins on the group level—we can further explore the conceptual difficulties hidden in the word by idealizing the two polar meanings. Asch (1952) uses this heuristic dichotomy of “extreme doctrines” to propose his own solution to these dilemmas. I am much indebted to his effort in the section on process emergence below.

Asch is concerned with the same problem being discussed here—what Allport (1962) calls “the master problem of social psychology.” How can we attribute qualities like action, agency, or autonomy to the collective level? One view takes this as a figure of speech that is literally impossible. All group phenomena must be reducible to individual phenomena. The other view takes it as a given that the collective level has these qualities. The first idealized pole is the “individualistic thesis”, the latter is the “group mind thesis.”

The Individualistic Thesis

Using Schein’s (1985) popular description of organizational culture, individuals sharing a culture are said to share world views, assumptions, values, understandings, solutions, learned self-images and the like. The apparent implication for organizational intervention is that individuals and their behaviors must be modified to change the “learned group repertory” (p. 176). This does not lend itself to an explicit model for how to change the group level phenomenon. This is despite acknowledgment that organizational culture is a group level phenomenon. For lack of a group level conceptualization of organizational culture, there seems to be a pervasive tendency toward this individualistic thesis.
Asch identifies two basic assumptions underlying the individualistic thesis. First is that psychological processes occur only in individuals. It is perhaps not clear, then, what the boundaries of “psychological” are. If “psychological” is defined as something that individuals do, then the claim is elliptical and not much use. But perhaps this assumption roughly means that there has to be activity on the individual level to support an organizational culture, and organizational culture must be reducible to individual level phenomena. The second basic assumption is an explicit denial of the idea of emergence. A new phenomenon does not arise at the group level. Given this assumption, the group becomes an abstraction of aggregates of individuals’ behaviors.

One position somewhat like the individualistic thesis comes from the behavior analysts:

[W]henever reference is made to organizational level behavior…this behavior is understood to be a summary measure of collective organizational member behavior. (Mawhinney, 1992, p. 5)

Group level phenomena are considered only “colligative”. The word colligative, according to Mawhinney, is from Physics to denote properties such as temperature that only make sense as measurements at a collective level, but are constituted and explained at a lower level. Individual molecules do not have a temperature. However, aggregates of molecules always have a temperature which is explained in terms of behavior of those individual molecules. In this same way, organizational culture is colligative. It is measured and conceptualized at the larger level, like temperature, but is to be explained in terms of the smaller units. That is, group phenomena are summary measures of individuals’ behaviors. Though a direct analogy is not made between individuals and molecules, the only factors and dynamics that are considered in this model are based on the individual level. It is not imagined that individual humans’ efforts interact in a more complex way than colliding molecules do.
Despite this critique, behavior analysts probably qualify as individualistic thesis thinkers only on the first criterion: reducing group level phenomena to the individual level. Ironically, behavior analysts do not deny emergent phenomena. They have developed a robust conceptualization of “selection by consequences” (of which Darwinian evolution is an example) as a model of individual learning. Behavior analysts also use this at a macro level to analyze selection of financially viable organizational cultures—along the lines of population ecology (Hannan & Freeman, 1977). The idea of emergence through selection by consequences is deeply ingrained in the theory and has a powerful ability to explain emergent phenomena. Unfortunately, there is not an analysis of intra-organizational development of organizational culture using a selection by consequences model. Organizational culture is reduced to an analysis of “personal reinforcement histories of individual decision makers” (Mawhinney, 1992, p. 19), that is, individual learning.

Another exemplar of the individualistic thesis might be an article by James, Joyce and Slocum (1988) concerning organizational climate. They make a claim that “organizations do not cognize.” Although it may make sense that the unit of analysis be an aggregate for the “situation” (such as a group or organization), the “unit of theory” needs to remain at the psychological level of the individual. They note that at all points social construction or sensemaking is based upon the construction or sensemaking of individuals. They admit that there is significance to “dynamic social interaction processes” but deny that their occurrence implies that sensemaking or cognition is a social level phenomenon. Because social level phenomena rely on individual level ones, they conclude that the former can be reduced to the latter.

From the idealized individualistic thesis there is no allowance for how a culture emerges at the group level. Nor can we address the individual’s experience of the
consensus of “the group” as something external and real. This lack is recognized in the polar opposite camp of the “group mind thesis.”

The Group Mind Thesis

At the other ideal end of the spectrum is the group mind thesis. Perhaps most representative is the position of Durkheim and Sociology in general. To Durkheim, a culture is a self-creating phenomenon:

If, as we may accept, the synthesis and *sui generis* which every society constitutes yields new phenomena, differing from those which take place in the individual consciousness, we must also admit that these facts reside exclusively in the very society itself which produces them, not in its parts—that is in its members. Thus they are in this sense external to individual minds considered as such...Social facts do not differ from psychological facts in quality only: *they have a different substratum*... (1938/1896, xvi, as cited in Cole, 1991)

Here we see the autonomy of culture honored as a thing external to individuals. From this perspective culture is superorganic (Kroeber, 1949), qualitatively different and emanating from another substratum than human behavior. Other representatives of this perspective might include Jung’s concept of a collective unconscious (1967). Here is the logical conclusion of the group mind thesis. Group mind is transcendental, mysterious and taken axiomatically. There is no possibility of explaining culture in terms of individual human behavior.

There is little ground for agreement between these two poles as depicted above. But that depiction is somewhat distorted. Few theorists really take on the extremes of the continuum. Most hedge some way or other, acknowledging that the two extremes lead to fallacies. Sociology does not presume that culture comes from the activities of some species other than humans. And on the other hand, the idea of colligative behavior suggests the potential to think of colligative structures that differ from their foundations in individual behavior. Thus, trying to give pure examples of the above two poles is difficult. We must remember that Asch developed the dichotomy as a heuristic. Although this dichotomy of reducing the phenomena to either the group or individual pole does
have powerful sway over our thinking, every theorist has to deal with a tension between the two levels which remains relatively unexplained. One way to deal with this unresolved tension is to relate the individual and group levels as a dialectic.

**The Dialectical Approach**

Cole states that addressing the ambiguity of the word sharing in “socially shared cognition” leads to questions about the “locus and origins of the shared parts of cognition” (Cole, John-Steiner, Scribner, & Souberman, 1978, p. 399). Above, Asch critiques two approaches that find that “locus and origin” in either the group or the individual. We could say that one approach emphasizes the individual-to-group direction of causality and the other emphasizes the group-to-individual direction of causality. I will claim that these are two positions out of four possible positions that can be taken on this question. The third position is what I call a dialectical response. Looked at dialectically, the group and individuals could be seen as co-constitutive. Each creates or causes the other in a continuing mutual process. The dialectical approach seems to offer a compromise position between the group mind thesis and the individualistic thesis. From this perspective, causality does not flow from one pole to the other but is reciprocal between the two. The group and individual levels are seen as co-constitutive. Though a reasonable and popular perspective, this still leaves us with several problems. The distinction between the two poles can be lost, the two poles can be reified, and the part-whole relationship of group and individual levels can be ignored. Though these are not inherently problems in the use of the concept of dialectics, they are problems frequently enough to critique them under the rubric of “the dialectical approach”. I will now take up each in turn.

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2 I think that a case could be made that the process emergence model presented next is indeed also dialectical. The caricature of dialectics as contrasting with the process emergence model is hence a little forced, but it helps illustrate several important points.
Losing the Distinction

The first possible danger for the dialectical position is that the distinction between the levels can be lost entirely. Since the two levels are mutually causative, discussions of causality can lose their specificity. Hatch (1993) exemplifies this dilemma:

Some readers have criticized the cultural dynamics perspective on the grounds that the level of analysis is ambiguous. These readers want to know whether the processes described by the model occur within individuals or among them and whether the processes are cognitive or social in nature. In large measure, it is through culture that a person constructs the sense of individual and organizational identity and creates images that are taken for the self and the organization. Within the cultural dynamics framework I assume that individuals cannot be conceptualized apart from their cultures and that cognition cannot be separated from social processes. Therefore, cultural dynamics cannot be described in the either/or terms presented by such a question. (p 682-683)

Hatch may mean two different things here. One is that all of the processes involved in her model are co-constitutive. They involve effects from the individual pole to the group pole and also effects from the group pole to the individual pole. If this is the case, the shortcoming is that we have lost the specificity of which causes come from which pole. Mutually causative does not mean that there are not particular causative activities that happen more specifically from one end or the other. Presumably the effects of individuals and of groups are different and we could learn more about the dialectical dynamic by looking at the specific sources of cause. If we want to understand the relationship between the two levels, we need to accept their different roles in the overall process.

The second more probable way in which Hatch may mean this quotation is that culture is a continuous matrix of the social and cognitive (psychological). Thus a distinction between the two poles is creating a dichotomy—an either/or—that does not exist. Her quotation seems to be saying this, rather than merely not specifying which pole causes what. In the sense that the model postulates a continuous social-psychological matrix, it is not a co-constitutive model. Perhaps this is no longer dialectical. It most resembles Asch’s group mind thesis. This is an interesting position, however, we would need to spend more effort on just what this matrix is if it is not a dialectical relationship.
between the group and individual levels. The distributed self-representation (DSR) model proposed later in this dissertation might be construed as another way to view such a social-psychological matrix that nonetheless maintains the distinction between individual and group.

**Reification**

The second possible danger of the dialectical approach is hinted at above. If we take my first interpretation of Hatch’s quote—that two poles of a dialectic interact—we need to learn just what that interaction might be. This is often particularly problematic when we try to figure out how the group affects the individual. The question seems to imply a reification of both the group and the individual. The conceptual reification of the individual is so ingrained that it is probably beyond untangling here. Suffice to say that something like the DSR model described below might conceivably be applied to individuals as well. We would then be able to conceptualize the individual without reifying individuality. This is roughly the project of some theorists of consciousness (Calvin, 1987; Dennett, 1991) whom I will discuss later. On the other hand, the reification of the group level is a consistent concern in theorizing about group level phenomena and is addressed here.

Objectification (related to reification) is a process acknowledged by Berger and Luckmann as a part of their dialectical explanation. Culture stands in dialectical relationship to individuals in the following way:

[T]he relationship between man [sic], the producer, and the social world, his product, is and remains a dialectical one. That is, man (not, of course, in isolation but in his collectivities) and his social world interact with each other. The product acts back upon the producer. Externalization and objectification are moments in a continuing dialectical process. The third moment in this process…is internalization (by which the objectivated social world is retrojected into consciousness in the course of socialization) … It is already possible…to see the fundamental relationship of these three dialectical moments in social reality. Each of them corresponds to an essential characterization of the social world. Society is a human product. Society is an objective reality. Man is a social product. (Berger & Luckmann, 1966, pp. 57-58)
To paraphrase, culture is an externalization created by individuals which after objectification then comes back to constrain individuals as internalizations.

There is always the danger that an objectification can become reified. Not only is culture experienced as an external reality, but it is perceived as a thing. This is a natural process of everyday reality and it warrants the attention it gets in Berger and Luckmann’s work. However, the theory derived from this model can lead to a theoretical acceptance of the ontological reality of this reification. Rather than see reification as a perceptual phenomenon, the reified products of that process are actually reified in the theory. It is as if because the theory tells us that the group level is imagined as a thing, then it is a thing. This unjustified reification leads to predictable conceptual difficulties. We begin to look at the individual and cultural levels as separate things interacting.

**Losing the Part-Whole Relationship**

The idea of group and individual levels being two “things” is reinforced by the internal/external metaphor of Berger and Luckmann’s dynamic. In describing institutions as reifications, the idea of externalizing makes sense. But when we persist with the metaphor, the “objectifying” as a verb condenses into a “reification” as a noun. The idea of objectification as a process is confused with a reified thingness of the group.

Berger and Luckmann were actually fairly careful on this count:

*The institutional world is objectivated human activity, and so is every single institution. In other words, despite the objectivity that marks the social world in human experience, it does not thereby acquire an ontological status apart from the human activity that produced it. p. 57 (Berger & Luckmann, 1966)*

However, much of the ensuing discussion has been less careful. Given the tendency for reifying the two poles of the dialectic, the dialectic perspective potentially models the relationship of group and individual as if the two levels were two interacting “things”, each with an agenda to impose on the other. This was a perspective which Asch (1952)
dismissed as an “external relationship” between the two. Each pole of the dialectic is reified and is more or less given a separate ontological status.

Once this conceptual shift has occurred, the autonomy of the group against the individual is presumed rather than explained. The dialectical nature of the relationship is lost despite the continued use of the term. Now the discussion shifts to what the group does to individuals and what individuals do to the group. A contest ensues between two loci of autonomous cause. By autonomous I mean self-regulating at their own level. But this mostly leaves out Berger and Luckmann’s discussion of how specifically a group can do that. Now “dialectical” is synonymous with a simple polarity between two forces. The group and individual are in a tension as commensurate peers.

Dialectics are often presumed to happen between peer-like “dialectical moments”. For example, two economic classes exist in contradiction to each other and are to be resolved in a synthesis that transcends class. Similarly, the individual and the group are presumed to exist co-equally in a dialectic that ultimately resolves in a social-psychological matrix of some kind. But this requires a more complex interaction than a contradiction between two equals. The group and the individual are more deeply connected than that at the outset. This is because of the inherent part-whole relationship between them.

**A Fourth Option: Process Emergence and The DSR Model**

In the DSR model—our fourth option—I suggest that there is not a simple reciprocity between these two levels, but rather a part-whole relationship between the group and the individual. Individuals as corporeal bodies (not yet as social beings) are a necessary physical substratum of groups. In this sense there must be a part-whole relationship between the individual and the group that is not often acknowledged in the dialectical approach.
This implies also that there are not similar types of causality in the two directions of the dialectic. The kind of influence that the group has on individuals must be quite different from the type the individual has on the group. The modes of action of a group cannot be the same as those of individuals. These issues are resolved in a model of “process emergence” that I will develop here as our fourth option to understand the relationship between the group and individual.

If the DSR Model is to offer a fourth choice, it must overcome the shortcomings of the other three choices. It must show how the relationship between the two levels is not reducible to either level. It must describe how this relationship goes beyond an “external relationship” between things. It must take into account the part-whole relationship of individual and group. The DSR model does this by looking at the group level as it “emerges” from the level of individuals.

A new level such as the organizational level must be two things. It must be a process and must be emergent from the interaction of processes at the lower level. Hence, I have called the DSR model a “process emergence” position. This new emergent level is not only constituted of parts but it also becomes autonomous and can have some control over the parts. Sperry’s work (1988) on emergence develops this idea specifically in Psychology. He describes this as “downward causation” (D. T. Campbell, 1974) or “supervenient control” of emergent layers over the parts that constitute them. Minsky (1985) applies much the same principle in describing mind in terms of a “society” of smaller parts from which mind emerges. In a response to Sperry, Sampson (1994) makes reference to an emergent sociohistorical level above that of the individual. Kelly (1994) generalizes the principle of emergence to many other fields. Kelly summarizes the phenomenon with the phrase “more is different” (p. 13). At a higher level, something new happens. To understand why a process emergence position is compelling, we will need to take a look at the concept of levels.
The Idea of “Levels”

The basic idea of levels of analysis is that smaller parts make up larger wholes. Analysis can be done at the level of the parts, at the level of the wholes or across levels. This has implications for defining what variables might be relevant in any research question. In the case of our current discussion the question is not whether the organizational level can be a level of analysis, because clearly it can be and is. The question is whether the organizational level can be what James, Joyce and Slocum (1988) call a “unit of theory” with respect to learning. Can we theorize about how organizations learn at the organizational level, or should we always reduce this to what individual human actors are doing? The question is whether organizations are a learning phenomenon in their own right, rather than an aggregate of learning phenomena at the individual level.

Some might see it as reductionistic to suggest that there is a part-whole relationship between the individual and group. If we always point out that the whole is made up of parts, it might suggest that the whole is no more than its parts. However, this is exactly what I am trying to dispute. I will show that the whole is more than its parts and how it comes to be so. A reduction is when a simplistic explanation of a phenomenon is offered in terms of another phenomenon already understood. I hope not to be simplistic, but I also hope to explain group phenomena partly in terms of individuals’ behaviors. The project is perhaps well summarized by Allport (1962), who aspired to...

...construct some sort of model that will show both the individual and the collective levels simultaneously—that will describe, in other words, how the latter is made up of the former. (p. 5, fn.)

If the higher level—the organization—has properties of learning at its own level, we want to know how those properties come about. A traditional cross-level analysis does not need to do this. The concern there is only to find whether a variable at one level covaries with one at another level. A dynamic explanation is a bonus, but not necessary. Levels in
this sense can operate as groupings of smaller parts into meaningful wholes. For example, counties are grouped into states, which are grouped into countries, etc. In this sense we can easily analyze at one level without theorizing much about its composition. The higher level might be a simple additive collection of things at the lower level. In the organizational literature this leads to a theory that as individuals learn more, the organizations that they constitute are better able to adapt to their environments. This is a reasonable implicit theory, but it is not much of an explanation of organizational learning.

We want to now how learning at the organizational level is explained in terms of processes at a lower level. Process emergence purports to explain how the group level process is composed of individual level processes. This composition is presumably more complex than simple addition. Some other function defines how the group is composed of its parts.

In looking at process emergence, the part-whole relationship between individual and group is not a hindrance to be ignored, but is integral to the explanation. Emergence is intrinsically a level issue. To the terms “level of analysis” and “unit of theory” we can add the term “level of emergence.” A level of emergence might be described as a level at which a new process is composed which differs from its parts. It could be a level of “autonomy” or “self-direction” or “autopoiesis” (Zeleny, 1981). Much of this model is derived from Allport’s work on “collective structure” and Asch’s “structural account of the individual-group relation.” From those perspectives we might consider a level of emergence to be a new “level of structure.” For now the idea of “level of emergence” will suffice.

**Emergence of a Process**

I want to briefly foreshadow a way in which we can talk about the emergence of a new process level. In rejecting the dialectical model of two reified poles interacting, I do
not want to propose another model of emergence based on reified things. Rather, emergence should be thought of in terms of a new process emerging at a new level. A simple way to think of this is to view a process as a cybernetic feedback loop. A loop is autonomous, or self-controlling. By combining several of these loops together, they could form a larger self-controlling loop. Visually, this might be imagined as a loop made up of smaller loops. If these smaller loops contain information about the larger emergent loop, their interaction could create this larger emergent process loop.

Using Bateson’s (1972) framework about learning, the process emergence approach—in the form of the DSR model—postulates how learning at a group or organizational level can occur as a level of emergence composed of lower level processes. Before going into the details of the DSR model, the next chapter will deal with defining process emergence. One way to accomplish this definition is to describe criteria for when we might say that process emergence is occurring. I believe we can define process emergence with three basic criteria. With these criteria in place we can test my explanation of process emergence in the third chapter of the dissertation.
Chapter II: Criteria of Process Emergence

Emergence is described by Kroeber (1949) in terms of four levels of organization. Culture is the last “superorganic” level above body, psyche and society. Each level sets the “laws” for the next higher level, but does not determine the phenomena. Each new level emerges with its own integrity and autonomy (my words). Though lower levels generally condition the higher levels, the converse is also true; e.g., culture affects individuals.

Many predecessors of the concept of emergence are cited by Kroeber (1949) and by Kroeber and Kluckhohn (1952). Kroeber eschews the vitalism, as typified in Bergson’s “élan vital”, which preceded a fairly recent appreciation of the idea of emergence. Wheeler (1928) is cited in Kelly (1994) for his early work on ant colonies as “superorganisms” that brings a new, more radical perspective on emergence. Wheeler insisted that ant colonies were not simply analogous to organisms, but that they should be considered as autonomous organisms in fact.

The concept of emergence as I develop it here is nearly the same as D. T. Campbell’s (1974) “downward causation” cited in Sperry’s (1988) work on “emergent interactionism.” A general premise is that emergent phenomena such as consciousness or subjectivity are able to interact at their own level as well as have “downward causal control” or “supervenient control” over more basic levels. The principle is called “macro-”, “molar”, or “emergent” determinism as opposed to the microdeterministic view that all emergent phenomena should be explained away in terms of the interacting constituent parts.

3 Kroeber and Kluckhohn (1952, pp. 148-149) very nicely summarize the beginning of the idea near the turn of the twentieth century.
What is an Emergent Level?

Perhaps even the question “What is a level?” discussed above is not so easily answered. That question is usually confounded with the larger question of whether new properties emerge at a new level. I am presuming that new properties do emerge, and that they relate to the new level behaving autonomously. If this is so, to what processes do we attribute that phenomenon? I consider it fundamental to the idea of emergence that a new level does indeed emerge from another level, not that it arises spontaneously on its own. There remains at least the theoretical possibility of explaining emergent level phenomena in terms of the interactions of its smaller constituent parts. This is not to explain them away as no more than the sum of the parts. The explanation should be how the whole does become greater than the sum of the parts. Brodbeck (1958) makes a claim for a similar position under the banner of “methodological individualism”. By this he means that group level phenomena are potentially reducible to an account of individual phenomena, even though practically this is impossible as well as not necessarily useful. In other words, the emergent group level is in some ways to be explained in terms of the individual level. He would have theoreticians strive for a set of “compositional rules” (Krantz & Tversky, 1971) by which the group level is explained in terms of the individual level. However, this is not to be done in order to explain away the emergent level as nothing more than processes at the lower level.

A shortcoming of methodological individualism is that it might ignore the downward causation by which the individual level is dependent on the social level. The idea of compositional rules suggests that we only need to understand how the group level is composed of the individual level. However, we must also allow for how the individual level is “composed” by the group level. Furthermore, the two levels are not only mutually causative, (dialectically related), but are somehow more intricately entwined.
Given the shortcomings of that particular approach, we should still be interested in how the group level emerges from the interactions of lower level parts. It is probably not useful to imagine the group level arising from some other process beside individual activity. This would lead to a group mind hypothesis based on the *sui generis* nature of the group level or on some new external explanation like Bergson’s “élan vital”. I would like to look for what might simply be an explanation of where the emergent group level comes from.

At the other end from the group mind hypothesis, James et al. (1988) and Glick (1988; 1985) debate the issue in terms of whether organizational climate is an emergent level or just an abstraction (a central tendency) of individuals’ “climate.” Climate can be conceptualized as an emergent phenomenon in its own right, or it can be an abstraction about the psychological states of the most typical individuals in an organization. The question is whether it is legitimate to imagine climate as an emergent phenomenon, which though dependent on the states of individuals, operates as an autonomous process on the group level. Later when I show how this emergence might happen it becomes more credible to claim that it does indeed happen.

A definition of emergence should allow both for the explanation of a new level of phenomenon in terms of a lower level as well as establish that something new is occurring at the emergent level that is different from a mere aggregation of smaller phenomena. The group level is neither a mystical self-composed phenomenon nor is it merely a fictional abstraction. Emergence is when a new level has its own autonomy. An emergent level is able to adjust itself. Put another way, learning occurs at the emerged level—not just in its parts but as a whole. A level of emergence is a level of learning.

Another hallmark of emergence is the idea of downward causation. If a new level has its own autonomy, we would expect it to influence its parts. From my perspective, this downward causation must occur at every level of emergence, not just the cultural.
When I move my body from my desk chair, my presumably emergent mind controls a
great concatenation of cellular processes which then move substantial molecular mass.
Yet my brain is made up of nothing but those same cellular and molecular processes, (I
presume). In everyday thinking, we simply take it for granted that our “psyche” level
minds can do this. Perhaps this is really quite startling—just as it is commonplace but
startling that culture affects individuals.

This principle of emergent determinism does show promise by recognizing how
emergent levels can control lower levels of which they are constituted. In our case,
although organizational culture is made up of individuals’ behaviors, organizational
culture can be seen as a supervenient control over those same individuals. Sperry indeed
suggests that this perspective is applicable to many other disciplines. To this reader, his
hypothesis appears general enough to apply to organizational culture.

My impression is that most thinkers do not really have a problem with the idea of
emergence at lower levels. The analogy of the relationship of the parts of the body to the
whole body seems relatively unproblematic. The emergence of mental functioning in the
individual from brain processes is only sometimes considered problematic. What seems
most difficult is exactly the transition that I want to make here—from the level of the
individual to the group or organization. With this step come the twin fears of either
denying individual autonomy or of hypostatizing a mystical unexplainable group mind.
By understanding the dynamics of emergence, it is to be hoped that the following
argument will not fall into either of these traps.

**Bateson and “Mind”**

The project now is to develop a general model of emergence, which I will later
apply to the specific example of the organizational culture level. I will describe that
general model in terms of three criteria that any model of emergence might be expected to meet. This is not definitive, but seems like a good start at such criteria.

I would like to define process emergence as “a combination of processes that results in a new process with its own autonomy.” I have even called an emergent level “a new level of autonomy”, where autonomy means the ability to learn. Learning is the capacity to change or stay the same depending on internal feedback or feedback from an environment. This is what I hope to show happens at the organizational level. I propose three criteria that must be met by a good model of process emergence. In turn, when these principles are understood and the criteria met, a dynamic model of process emergence becomes possible.

It is helpful to explain why I am setting out three criteria for emergence. One reason is to emphasize the presumed universality of emergent phenomena by showing how the organizational level examples fit into a larger framework. Another reason is to connect this work with the specific program set out by Bateson in *Mind and Nature* (1979). Bateson similarly attempts to describe process emergence—which he called “mind”—in terms of six criteria. Bateson states his rationale as follows:

> This chapter is an attempt to make a list of criteria such that if any aggregate of phenomena, any system, satisfies all the criteria listed, I shall unhesitatingly say that the aggregate is a *mind* and shall expect that, if I am to understand that aggregate, I shall need sorts of explanation different from those which would suffice to explain the characteristics of its smaller parts. (Bateson, 1979, p. 91)

By saying that this new aggregate requires a sort of explanation different from that of its smaller parts, I conclude that he is talking about something very similar to what I am calling process emergence. Wherever mind occurs I might also say that a new emergent level is operative.

I will first look at Bateson’s criteria for mind. Then I would like to present a related set of criteria for process emergence. Bateson’s are perhaps more generic and mine harbor the inklings of a model, but I think that the DSR model I develop later will
satisfy both. When these three criteria are met, the sufficient conditions are present to say that process emergence could occur.

**Bateson’s Criteria of Mind**

**Bateson’s Epistemology**

Bateson was intent on describing a “pattern which connects” as a logic that pervades all life or “creatura”. Following Jung and the Gnostics, Bateson’s world is divided into “creatura” and “pleroma”. The creatura—the living—are distinguished from the non-living by the significance of differences and distinctions (information). Whereas the non-living are ruled by cause and effect, in the living realm, *information* can be a cause. The ability of the creatura to process information gives them the capacity to learn. Learning thus becomes the basic epistemological category, the “pattern which connects”, defining life.

In *Mind and Nature* (1979) Bateson attempts to detail an analogy between the processes of biological evolution and those processes such as learning which broadly characterize “mind.” To develop the analogy, he describes mind in terms of six criteria. These criteria describe both examples. Further along, when we look at all six, I will say that organizational culture is also mind—meeting Bateson’s six criteria. His six criteria are recounted below with some commentary.

**Bateson’s Six Criteria**

1. A mind is an aggregate of interacting parts or components.

This is basic to what I am trying to establish here, that mind is an emergent process created in the interaction of smaller partial processes. This is in contrast to the polar ideas described above: that mind mysteriously springs up whole, more or less
independently of individuals (the reduction to the group pole), or that there is in fact nothing emergent (the individual pole).

2. The interaction between parts of mind is triggered by difference, and difference is a nonsubstantial phenomenon not located in space or time; difference is related to negentropy and entropy rather than to energy.

Criterion 2 shows how Bateson is keen on the importance of information and to avoid confusing metaphors about energy. I will talk more about energy and matter below. Criterion 3 is a corollary of criterion 2.

3. Mental process requires collateral energy.

Because causality is triggered by difference or information, energy is not the key variable. Activities that require energy are triggered by difference, not energy, so the energy to achieve them must come collaterally. In criterion 3 Bateson underlines a major tenet of Systems Theory, that mind needs to be an open system with respect to energy or it will eventually cease from increased entropy. Open systems are not only interesting because they can decrease net entropy but because of how some use feedback and information to do so, (as we will see in criterion 4).

4. Mental process requires circular (or more complex) chains of determination.

Criterion 4 is an acknowledgment that mind involves feedback of some kind. Circularity insures that the output of a process impacts that process itself. In this way a process can “learn” from previous output and change itself. The process must refer to itself: it makes a self-reference.

5. In mental process, the effects of difference are to be regarded as transforms (i.e., coded versions) of events that preceded them. The rules of such transformation must be relatively stable (i.e., more stable than the content) but are themselves subject to transformation.

Criterion 5 acknowledges that feedback is inevitably coded in some way. Organizational feedback is coded in language and other symbolic ways, such as artifacts. The representation of the group is the particular coding that we will be interested in here.
Bateson might have noted that language and symbolic processes are in turn subject to change, but this is tangential to the argument here.

What should be noted here is the way in which one cybernetic loop can be the subject of transformation at another level. What are “rules” at one level are subject to feedback at a higher level. This suggests the quality of having loops within loops, which is elaborated upon in criterion 6.

6. The description and classification of these processes of transformation disclose a hierarchy of logical types immanent in the phenomena.

A pivotal aspect of Bateson’s model is that it describes a ubiquitous layering of feedback processes. This is a description of emergence itself, that these processes have a hierarchy whereby interactions between parts on one level create a feedback loop at a higher (emergent) level. In the group level case, I am looking for a way in which the feedback cycle about the group is at a higher level of abstraction or “logical type” than the information exchange between individuals. I want to describe feedback to the group.

**Overview of Three Criteria**

Bateson’s criteria are very complete. Given Bateson’s broad approach to “creatura” and the “pattern which connects”, it is not surprising that Bateson’s criteria should be quite broad as well. I want to develop a set of criteria which although perhaps not as universal, might help us narrow in on emergence as it occurs in organizational culture. These three criteria also lean a little towards a particular model of how emergence occurs.

In the briefest overview, I will contend that emergence can only occur between processes, never between entities, things, substances and the like. Secondly, these processes must be circular and iterative. That is, there must be feedback to the beginning of the next cycle in order for there to be learning. When learning occurs at a new level,
this is hard evidence that the level exists and is relevant. Finally, for this circular/iterative feedback to occur, there must be some mechanism by which the whole is coded in its parts. In order to learn, a system or level must be able to learn about itself, and it can only do so through the processes of its interacting parts. These parts then can always be said to be carrying information about the whole back to the whole.

I will now discuss each of these criteria in turn. Throughout, I will connect these three criteria with Bateson’s six criteria above.

**Process, Not Substance**

The concept of emergence can be related to the idea of synergy. The popular maxim regarding synergy is that “the whole is more than the sum of the parts.” Though the idea of synergy may help us, understanding of the dynamics of emergence is particularly hindered by our thinking of a synergy of *things*. For my argument we will need to look at the synergy of *processes*. Once we have made this shift, the idea of an emergent process is not so difficult to explain. Thus, the first criterion of emergence is that processes, not “things” or substances, must lead to emergence.

This point is particularly based on the work of Asch (1952), who showed that a “social system” must be “present in the *interrelations* between the *activities* of individuals” (p. 252, emphasis added). The group level is not a relationship between individuals but one between their activities—a relationship of processes.

Parallel to our discussion above about dialectics and Asch, we should not look at the group level as an “external relationship” between individuals. The relationship is intrinsic to the activities performed by individuals. At the same time, these activities are related to the activities of other individuals, and they go beyond the bounds of what might be called individual behavior. Before detailing how this is so, we can look at the perils of ignoring the interrelationships of processes. We can thereby escape from two common
debilitating metaphors based on a conceptualization of synergy between “things”. I call these the “matter” metaphor and the “energy” metaphor.

**Matter Metaphor**

Groups are frequently conceptualized as “things” which have some other things (members). However, when we look for a collective mind we become stuck also in looking for the collective brain. Given that the collective mind has no collective “body” (apart from individuals) we become confused. In this way, treating emergence as something that occurs between things is problematic.

A special case of the matter metaphor is the “parts” metaphor. Though not openly a matter metaphor, talking about parts usually leads to a tacit matter metaphor. “Parts” are rarely considered as processes (though when I use the term here, that is what I mean). As long as parts are considered statically, there is no conceivable way in which they might “synergize” or create an emergent level.

Adopting a matter metaphor quickly and inevitably entraps us in the mind/body dualism that has plagued centuries of thought. We generally critique this as Cartesian dualism. Descartes’ flaw was in postulating two types of substance. Mind (*res cogitans*) was a substance of a similar but distinct type from matter. The motivation behind the error was the need to explain how mind could influence the body. Only another substance could have this effect. Dennett (1991) discusses this clearly and points out that we are barely better off at explaining this now than Descartes was.

That situation leaves us shrugging our shoulders or perhaps falling back on somewhat vague explanations based on metaphors such as “chaos” or quantum mechanics. These “new paradigm” answers are as problematic as Descartes’. At their worst, they can amount to abusing the unexplained in the service of the mysterious. Minsky critiques the enthusiasm for the idea of synergy as follows:
We’re often told that certain wholes are “more than the sum of their parts.” We hear this expressed with reverent words like “holistic” and “gestalt,” whose academic tones suggest that they refer to clear and definite ideas. But I suspect the actual function of such terms is to anesthetize a sense of ignorance. (Minsky, 1985, p. 27)

Given this quagmire, a sober thinker is probably inclined to abandon the concept of collective mind altogether.

**Energy Metaphor**

A seeming relief from the matter metaphor comes from the field of Systems Theory. Here the root metaphor seems to be “energy.” To understand the role of energy in the theory we need to look at the second law of thermodynamics. This law states that the entropy of a closed system always increases (or stays the same) over time. Open System’s Theory intends an extension of this second law of thermodynamics, because open systems do not seem to “obey” the second law of thermodynamics. Open systems do not actually defy the second law of thermodynamics: they simply do not meet its criteria. The second law—regarding an inevitable increase in a system’s entropy—is about closed systems which do not import energy. But open systems, by definition, can import energy and thus can decrease net entropy.

When we look at open systems we see that entropy can decrease and new order emerge. For this to happen, energy is required from the environment. Energy thus seems to become an explanation or even a first cause of ever more complex systems of organization. In fact, however, energy—in the thermodynamic “joules” sense—is virtually moot in organizations. As long as the plant’s utility bills have been paid and employees have had a decent breakfast, there is plenty of this type of energy to adequately process information. Electricity comes through the wall to the computers and machines. Glucose infuses human brains with energy for thought and muscles for motion. But these energy sources are not the central determinants of an organization! Energy is a
necessary factor in an open system, but does not define it or even play a central role. So why is there a fascination with energy?

Energy as a metaphor is seductive and misleading because it (like sharing) harbors an ambiguity. Though the second law of thermodynamics refers to energy, this is intended in the “joules” sense of Physics mentioned above. In organizational theory this “joules energy” is frequently confounded with “psychological energy.” Perhaps psychological energy means something about human motivation or about capacity for creative thought. Then we conclude that this psychological energy leads to the emergence of new order and information in social systems. A short leap could let us conclude that culture is a function of “psychological energy.” Though intuitively appealing, it is certainly not an adequate explanation of culture, nor an accurate use of the laws of thermodynamics.

We must be clear not to confuse thermodynamic energy with the metaphor of “psychological energy”. We need to remain cognizant—as Bateson illustrates—that the critical metaphor is information, not energy nor matter. When we do this, it becomes much easier to focus on organizational culture as process (rather than matter or energy) and we can achieve some insights. Once we look at groups in terms of interaction or process, we gain a deeper awareness of what I now call process emergence and the relationship between the two levels of individual and group. By looking at processes, both individual and group levels can be respected and the emergence of the group explained.

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4 Information in this context is cybernetic. This is broader than the “information processing” models applied to organizations that might limit information to explicit and formal kinds of communications. We are not limiting ourselves to discussing computer systems, reports, speech acts and so on.
Social Psychology’s Synthesis

One way to look at a process of interrelation comes from Social Psychology in the concept of “structure”. Allport (1962) supports the point made above about interrelationship and wholes:

Wholeness, or totalities, must not be sought in “things” or “agents,” for matter, as commonly conceived, does not provide a workable paradigm of wholeness. Nor do they lie in the notion of open-ended, linear, and “molarly” conceived acts of such agents. They lie, instead, in (completed and self-closed) structures of ongoings and events. (p. 18)

“Completed and self-closed structures” are another way to describe processes. We can see that the interaction of *processes* constitutes something like a structure. We are reminded again that it is not individual people who come together to form a structure. As Allport says,

[I]t is really not the individuals as whole organisms, but these particular give and take behaviors of seeking and recognition, that can be most clearly said to constitute the group (p. 13).

Allport continues to describe what he calls structurogenesis. Because individuals come to be rewarded by the mutual cyclical behaviors they enjoy in groups, they in turn come to want to maintain the group itself. When these individual behaviors mutually support the group, they come to act as group pressures:

[T]hat which often *looks like* “group determinism,” “direction,” or “group pressure,” may not really be such, but may be better understood as the things which the individuals are doing to establish or preserve just this cyclism of interactions and their rewards. What looks like “group controls” are really structurizing behaviors of individuals. We are dealing with a process of *collective structurization* of individuals’ behaviors that *eventuates* in establishing or preserving the “group” (that is, the structure), rather than with a process of the determination of individual behavior *by* a group. (p.26)

Such structural reinforcement of the group goes some distance to explain how group level pressures emerge from individual behaviors. But the group is composed of the structural cycles of behaviors that are beyond any individuals.

Asch nicely summarizes the issues to be dealt with here. He describes the nature of an emergent system at the group level:
Such a system does not reside in the individuals taken separately, though each individual contributes to it; nor does it reside outside them; it is present in the interrelations between the activities of individuals. The form the interrelated actions take—on a team or in an office—is a datum of precisely the same kind as any other fact. (1952, p. 252)

This quotation seems to echo Durkheim’s concept of a social “facticity”. Though emphasizing the non-substantial nature of this kind of system, Asch insists that these structures are still very real, legitimate “data”.

Asch and Allport’s explanations are based on the perseverance of *interactions*. By emphasizing interactions we escape from the trap of how *people* can synergize. The idea that people synergize is a variant of the idea that things can synergize. Asch’s “interactions” *are* such a process as we might expect to synergize. In fact interactions with this level of structure are probably best seen as already being an emergent level. Individual processes in proximity allow for a new interactive process to unfold. If we are looking for a synergy—an emergence of a new level—we must look at processes.

The relationship between the structures I have been talking about and processes may sometimes seem antithetical. Structures seem fixed whereas processes are continually flowing. Actually, the two are different aspects of the same thing. More precisely, what they have in common is *not* being things. Both are about relationships rather than substance. We will see below that a process—seen from the perspective of its stability—behaves as a structure.

It may be helpful at this point to reiterate the conclusions in Chapter I about dialectics between two substances. Remember that our fourth option was to prefer relationship explanations over substance ones. Structure must be seen in terms of relationships. It is a relationship of processes. It is also another process.

At this point I can relate this first criterion to some of Bateson’s six criteria. Bateson would also insist that emergence is not from out of nowhere, but from smaller parts. What is more, these parts are interacting, (Bateson’s criterion 1). Bateson also
insisted that the root metaphor is one of information and that energy or substance do not suffice to explain the phenomena, (Bateson’s criteria 2 and 3).

So, if emergence is an interaction of processes, what sort of process emerges? In the following we will see that it is a circular and iterative one, (related to Bateson’s criterion 4).

**Circular/Iterative Causality**

My second criterion relates to what Bateson (1979) calls “circularity”. For learning to occur, there must be a way that the results of a previous trial are fed back to the beginning of the next trial. Describing culture as “superorganic”, Kroeber (1949) stated that circular causality was a fundamental attribute of the superorganic level:

> The human beings who influence culture and make new culture are themselves molded; and they are molded through the intervention of other men who are culturalized and thus products of previous culture. (p. 193)

This means that simple causal explanations are not possible. One way to articulate this criterion of circularity would be to say that emergence must be a cybernetic accomplishment. I take this from Bateson, who describes “mind” cybernetically. The organizational level can be autonomous only if there is some circular feedback mechanism.

These issues are dealt with in some ways in many other fields. Family Systems came to be understood as having their own feedback loops and homeostasis (Jackson, 1968). Group therapy (Durkin, 1981) integrated these same ideas. And many authors in the organizational fields have used cybernetic principles to understand organizations (see Richardson, 1991). Other concepts have played a role in thinking about circular causality. “Self-organizing” (Prigogine & Nicolis, 1977) has come into the popular vocabulary. “Autopoiesis” (Zeleny, 1981) is another concept that has enjoyed considerable attention in this regard.
An important principle to add here is that feedback is iterative. For circular feedback to work it must be repeated. When we begin to see culture as the medium of this cybernetic feedback, it will be clear that many small acts of feedback determine the organization rather than a few large management decision types of feedback. Feedback is iterative and virtually constant (Cook & Yanow, 1993; Weick, 1995). For this reason I prefer to call this circular/iterative causality. Learning can be slow and incremental in a model that allows for iteration. This is different from our common conceptions of learning where there is a singular marked change to a system. Though some feedback loops might operate in only one cycle, this is a misrepresentation of learning in the more general sense which nearly always involves many more iterations and recursions.

As an example, although Senge (1990) describes systems as repeating loops, his “causal loop diagrams” can lead to a somewhat static or simple sense of feedback. Analysis is done on a few cycles of feedback that illustrate a simple trend for the entire system. However, I believe a different sense of circular feedback is achieved when we consider feedback loops that repeat dozens, hundreds or thousands of times. Rather than showing simple trends, this kind of modeling allows for erratic behaviors and many wrong turns in particular cycles while still leading to overall learning in the long run.

I think also that iteration allows for the great stability of systems. The preponderance of the same cycle repeating itself relatively homeostatically and nearly unchanged suggests the quality that I called “structure” above. A process that is highly iterative might appropriately be called a structure.

**The Control Dilemma: The Game That Plays The Players**

The purpose of a cybernetic explanation should be that it explains the nature of control in a system. Our conception of control is limited if it is contained only in explicit control mechanisms. Organizational learning and organizational culture are both control
mechanisms. Sometimes this is deliberate control (Ray, 1986), but organizational culture is often controlling without any particular intention. We might imagine organizational culture as “control without a controller.”

Given the individualistic and humanistic trends in our culture, this runs contrary to our common intuition. If organizational culture exerts some control over the behavior of members of an organization we assume that someone is in control of that effect. I believe that the research romance of finding leaders’ influences on culture owes its appeal to the need to find a controller behind the control. Even if it is unconscious acts of a leader that influence culture, this is conceptually easier to digest than the idea of organizational culture as a “self-managing” (J. Roberts, 1964) phenomenon.

As a metaphor, we might imagine a culture as a kind of game, much as Pondy (1989) addresses leadership as a language-game (Wittgenstein, 1975). It has rules and procedures which control or direct the behavior of individuals. When we think of a game in the everyday sense, we think of conscious players voluntarily entering a game. Players play the game. A language-game, however, is much more complex. The game is subject to creative modification in midstream and is rarely available to awareness. Analogously, I would say that in a culture, the rules and procedures themselves come to dominate rather than players’ (members’) conscious intentions. The rules include how players enter the game, leave, play, change the game, or even have awareness of the game. Culture might be better conceived of as a game that plays the players.

This is important when we try to establish organizational culture as an emergent level. The phrase “the game plays the player” suggests the autonomy of the emergent level. It is this sense of the game as a “downward cause” (D. T. Campbell, 1974) (affecting the players who play the game) which establishes the phenomena as emergent.
Essentialism

Cybernetic control is an antidote to the essentialism about culture to which our empirical intuition might lead us. It is appealing to think that there is some essence that drives the entire phenomenon. Skinner (1971) sees a problem with this in Psychology and hopes to escape it. We also want to get beyond essences in organizational culture. As long as we look at cognition as a “first cause” we are stuck in trying to explain how this first cause can initiate itself. What homunculus initiates cognition (Dennett, 1991)? With circular/iterative causality there is no starting point. The process slowly migrates through changes, but without an instrumental intervention at the beginning.

This perspective is most clearly applied in evolutionary biology. Selection by consequences and the Darwinian model are paradigmatic of how autonomy can be achieved with circular/iterative causality rather than “first cause” causality. The circularity of feedback gives us a conceptual handle on how the emergent cultural level can manage autonomy. How can we describe how culture seems to move itself rather than be moved by its constituent members? It may be that Darwin was himself influenced by another thematic cousin—the “invisible hand” (Smith, 1902/1776) logic of classical economics. One could argue that an ideal\(^5\) market economy has the quality of a Darwinian system. Prices are replicated which, in the past, resulted in successful transactions. These “best” prices tend to persist until some change is introduced into the system. The entire system adjusts itself toward an ideal fitting together without intervention from outside the system.

Of course biological evolution was Gregory Bateson’s primary illustration of these dynamics. Biological evolution meets the first two criteria discussed so far (as well

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\(^5\) This is of course an ideal picture and economists will continue to debate how much this model fits the reality of economics. I mention it merely as another model with circular/iterative characteristics. It is also quite amenable to analysis as a stochastic system as described below.
as Bateson’s 6 criteria for mind discussed above). First, in biology the population and individual do not interact as separate substantial entities but as intertwined processes. Secondly, the reproductive outcome for individuals changes the population for future generations (circular/iterative). Information about the population’s success (by individuals) is fed back to the population and the population learns, but only in the next generation. The paradigmatic shift is from one of looking for moving forces, essences and the like that explain autonomous processes. A selection by consequences model can explain this autonomy without resort to essences.

Not only does selection by consequences in the case of evolution meet the first two criteria, it also describes the third criterion: part-for-whole coding. As we see above, it is each individual that carries information about what endured in the last generation.

All information is coded in the parts (individual processes). Yet, this is somehow indirect information about the whole generation of individuals that competed with its parents. This is an example of part-for-whole coding.

**Part-For-Whole Coding**

Circular/iterative causality is a powerful concept. But we must wonder how it actually works. The problem is to understand how a new emergent level gives itself circular/iterative feedback. In order to control itself, feedback has to both be from the new level and also must impact upon the new level. The definition of emergence is ultimately dependent on being able to describe how this feedback occurs.

Bateson’s fifth and sixth criteria of mind are fundamental to how I understand this issue. He develops the idea of “coding” in the fifth criterion. A system cannot have causes upon itself without smaller parts to transmit them. Those parts carry coded information about the whole system. Particularly in the case of organizational culture, there are no conceivable mechanisms to transmit feedback to the larger organizational
culture except through the behaviors and sensemaking of individuals.\(^6\) Again, these parts are not the individuals themselves, but the processes of individuals’ interactions. The interactions are coded information about the whole culture. A group thereby gives itself feedback that is *about the group* and that *affects the group* via the interactions between individuals.

Kroeber (1949) describes the intermediary role of individuals:

There is thus a continuity of indirect causation from culture event to culture event through the medium of human intermediaries. These intermediaries are concerned, first of all, with relieving their own tensions and achieving their personal gratification; but in so doing they also transmit, and to some degree modify, the culture which they carry because they have been conditioned to it. In a sense, accordingly, a kind of cultural causality is also operative. (p. 193-194)

Culture can span centuries—from the founding individuals that first shaped it to generations that have long forgotten these founders. Yet, individuals remain the *intermediaries* of culture. Individuals code the culture in manageable pieces that can be transmitted from individual to individual. There is no “mysterious storage vault” of culture besides these same individuals, their behaviors and the artifacts that they leave for others. Following Kroeber,

> The efficient causes of cultural phenomena are the actions or behavior of men—of psycho-somatic individual human beings. (Kroeber, 1949, p.193)

How do individuals do this intermediary work? Bateson might characterize the coded information utilized in culture as what he calls “part-for-whole coding”. The whole culture cannot be presented at once, but only parts of it from which we abstract the whole are. The “map” is transmitted, because the “territory” cannot be (Korzybski, 1933). The “map”—some information about the culture as a whole—is implicit in these interactions of individuals’ behaviors. This map codes the territory we know as culture.

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\(^6\) I would want to include the making and interpreting of artifacts under this broad rubric of “behavior and sensemaking.” Artifacts are a physical communication across sometimes large expanses of time, but they function similarly to the other kinds of communication we are discussing here.
How does this coding work? The parts need to carry information about the whole back to the whole. This is true even if the feedback’s action is just through and upon the parts. One way this can happen is if the parts contain the whole. The map is not just about the map, but about the “territory”. This type of coding allows feedback to cross between levels and connects the levels. As parts contain the whole, their interaction becomes a way that the whole can give itself feedback, at the level of the whole. Thus we achieve the layering of feedback characterized in Bateson’s sixth criterion.

Asch notes that the individual-group relationship is a “part-whole relation that depends on the recapitulation of the structure of the whole in the part.” Analogously, Pribram (1971; 1969) has described brain functioning as “holographic”, with parts containing the whole. This is now a widely accepted model of brain functioning that “mental representations” are not stored in just one location in the brain, but are widely distributed on a connectionist network (J. Campbell, 1990). Many parts carry the whole.

**Representation**

But how can a part contain the whole in a group? It is not in a physical sense since we are not discussing physical things. The parts and the whole are both processes and it is in this process sense that one contains the other. Each individual’s process contains some process about the whole. This coding of the whole in the part occurs through representation. As Asch notes…

> There are group actions that are possible only when each participant has a representation that includes the actions of others and their relations. (1952, p. 251)

Every member of a group holds some expectations of the group and its behaviors as a whole which in turn affect the individuals’ behaviors. By each individual carrying such a representation of the system, those representations can interact through the behaviors of the individuals carrying them.
This concept can be developed in terms of simple dyadic relationships. In an encounter with another person, one way that the individual can abstract a representation of the interaction is to contextualize it to that dyadic pair. Something has been learned about how these two people have just interacted and about how they will interact in the future.

The group is another such representation to abstract from the interaction. If the dyadic interaction happened within a group, it could lead to learning about the group as well as or instead of referring to the dyadic pair. If the interaction is only generalized to the dyad, it might not have an impact on a larger group culture. In order to have a cultural effect, their representation must be a generalization about the group carrying the culture. The principles of structurogenesis and self-closing cycles are fundamentally important to understanding emergence. But we need to look at them at a group level, not just dyadically.

Weick (1995) uses Wiley (1988) to describe a similar distinction. The dyadic level is “intersubjective” in that it involves a sense of “we” rather than just “I”. But it is still dependent on a particular other person who makes up the rest of “we”. A group can also be very dependent on expectations about particular individuals rather than generalizations about the group as a whole. Weick maintains that even an organization will have many meanings that are still dependent on the intersubjective level. The next emerging level is the “generic subjective”. At this level—where organizations mostly dwell—the “we” is abstracted away from particular individuals to a “generic self”. Individuals are superseded by roles and people become interchangeable with respect to the organization. This is only possible when there is a representation of the group that goes beyond representations of individuals in the group and their specific interactions.

It is useful to connect this idea of a representation with the idea of a group context. Another way of saying that individuals carry a representation of the whole is to
say that they see the group as a context for their own behaviors and the behavior of others. As we will see next, this context serves as a kind of “structure” to guide and constrain the behaviors of individuals. It is this structure that takes us beyond a simple aggregation of individuals’ behaviors to the group level:

One could say that all the facts of the system can be expressed as the sum of the actions of individuals. The statement is misleading, however, if one fails to add that the individuals would not be capable of these particular actions unless they were responding to (or envisaging the possibility of) the system. (Asch, 1952, p252)

Representation of a context acts as a structure. With this in mind we can address some parallel problems about the group level.

**Partial Inclusion and Context**

A good illustration of the importance of structure comes from Weick (1969) who describes the problem of “partial inclusion” (Allport, 1933) as follows. How can an individual function in more than one group without becoming confused about which culture to apply in each? The individual is only partially included in each group. So which group affects that individual’s basic assumptions? How does the individual keep from invoking the wrong cultural behaviors in the wrong setting? The idea of socialization poses a similar problem. We must ask ourselves how it is that an executive switching jobs can unlearn and relearn presumably deeply held cultural assumptions.

Allport’s model of “structurogenesis” (1962) described above, solves this problem of partial inclusion. As individuals enter different structures, they adapt their behavior to the “self-closing cycles” or “action circuits”(Barker & Wright, 1955) appropriate there. Socialization is not actually the dramatic matter, for example, of changing an executive’s basic assumptions about reality. Rather, it is a process of learning about which assumptions to invoke where. Cultural assumptions, (at the very least at the level of organizational culture), are always contextualized. It is the contextualization of behavior that needs to be learned.
In contrast, the idea of “differential interaction” (Van Maanen & Barley, 1985) does not account well for partial inclusion. The differential interaction model suggests that cultures are fundamentally bounded by the amount of interaction between people. However, even though having more interaction with persons in one culture, an individual knows how to act differently in another. For example, a very religious person is at ease at home where daily interactions support that religion. However, when that same person goes to work, they find ways to remain a religious person even in a secular surrounding. Clearly there will be pulls to go with the predominant culture of the moment. More time might be spent at work than in the cultural community of the religion. Ultimately there may be a serious risk of “going native” in the workplace. Yet, religious identity can persist if the religious person is able to consistently remind themself of their identity as part of their religious community, even when they are immersed in the workplace culture. They can observe themselves in the context of their religion and adhere to that despite “differential interaction” with the workplace culture.

The observation of the problem of partial inclusion forces us to see culture as always bounded by and referenced to structure-providing context. Alderfer (1977) even defines a group largely in terms of the mutual perceptions that contextualize a group:

A human group is a collection of individuals (1) who have significantly interdependent relations with each other, (2) who perceive themselves as a group by reliably distinguishing members from nonmembers, (3) whose group identity is recognized by nonmembers, (4) who have differentiated roles in the group as a function of expectations from themselves, other group members, and nongroup members, and (5) who, as group members acting alone or in concert, have significantly interdependent relations with other groups. (p. 230)

Can a process of differential interaction form a culture without any context? Perhaps differential interaction can form an abstracted group. When individuals note a differential rate of interaction amongst themselves, they may imagine a grouping. This can actually form a kind of group identity. Such is the premise of Social Identity Theory (Hogg & Abrams, 1990; Tajfel & Turner, 1986)—that perceived shared experiences lead to group formation. But if a group is formed, then one has already accepted the above
premise—that there is a contextualization of the interaction. It is then easy to imagine that this newly formed identity functions as a kind of group culture even when not openly acknowledged.

It could be argued that some cultures (in the broader anthropological sense) are absolute or global, and hence not contextualized. Perhaps there are groups that do not partially include but fully include all of their members. Can we then say that their behavior has a specific context? I maintain that even if an individual carries a representation of “what any sane human being would do” which derives from a global culture, this is putting a context around possible actions and perceptions. If there exists an alternative—any possible deviation—then the rejection of that alternative suggests a context. Even a culture that stands absolutely alone has an inside and an outside to it. This is what makes it a culture.

Contextualization is key to understanding the emergence of organizational culture. Understanding contextualization not only begins to solve the partial inclusion problem, it is also critical to the DSR model which I want to say causes the emergence and mind of organizational culture.

**Structurogenesis and Distributed Self-Representation**

Another way to describe structurogenesis is as a distributed self-representation (DSR). A structure is distributed because it is held by more than one participant in an interaction or group. Self-closing cycles work because two or more individuals have similar expectations of the interaction. That which an individual holds might be called a component representation. But the structure is held multilaterally and is a distributed function of several component representations.

This structure is a representation in that it is one view among many possible views of an interaction. It is constructed socially, and only has the reality that people give to it. I
call it a self-representation because, from the perspective of the interaction or group, it is self-referential. This is how a group comes to know about and learn about itself. The prefix “self” suggests both reflexivity and a rough analogy to the self and identity of an individual. This is a slight liberty with common notions of “self” but I think that it is useful.

The self-representation of the group is the group’s structure, which each member carries with them. A related approach to structure comes from Harris and Cronen (1979). They combine a behaviorist “rules-based” approach with an interactionist perspective to derive the concept of a “master contract”. Each member of a group contracts with the group and carries that contract with them in all of their behavior. This contract does not exist somewhere on paper but is distributed, with varying degrees of fidelity, among the members of the group. Yet it functions as a common template guiding each individual’s behavior. Though distributed, it constitutes the structure of the group.

It is helpful to note here again that the representations I am talking about are of the level above those who hold the representation. It is a representation of the whole, not of just one or another person’s behavior. It is a “contract” by which the group as a whole will perform. Contextualization, as discussed above, makes possible this reference to the whole (part-for-whole coding). The group is not a happenstance matrix of individual contracts with other individuals but rather a covenant with the whole.

**Artificial Intelligence and Distributed Processing**

Because the concept of part-for-whole coding is central to the idea of process emergence, I want to further elaborate on its implications. This will also serve as an introduction to the next chapter on stochastic process. An analogy with the field of artificial intelligence (AI) underlines the significance of the relationship between parts of a system and the whole. Central to that field is the idea of distributed processing.
Likening a group to a distributed artificial intelligence, we can imagine how a system of representations of the whole might emerge as a learning mind. Just as representations may interact in a brain, perhaps a group’s self-representations can interact to create a (group)mind. To develop this analogy we need to start with the criterion of a successful AI project.

The major issue for an implementation of artificial intelligence is that it cannot rely on an already smart controller. Simulating and then explaining smart control in terms of another internal smart controller obviously begs the question. So, if there is no central control, then where is the locus of “control” in such a system? Control is distributed in the parts of the system. More accurately, we might presume that control emerges from the interaction of parts of the system. But how is this possible? If the parts are not separately intelligent, how can their interaction be so?

The project of AI could be characterized as the effort to understand just this question. AI tries to understand mind through the processes of its constituent parts, i.e., to understand the mind in terms of its emergence from brain (and body) functioning. Being able to mimic mental functioning on, say, a computer would be a strong argument that a plausible model of the mind had been implemented. (Plausibility is of course increased if the model on the computer represents something similar to what we know of neuronal processes). In any case, mind is presumed to emerge from the interaction of mindless parts, i.e., processes across neurons or silicon chips. This problem of emergence has many of the same dilemmas that we face in the emergence of organizational culture. How can something smart be “distributed”? How can a smart thing be composed of parts that are not smart? And conversely how can dumb parts make a smart whole?

A prominent AI skeptic, Searle (1980), developed another analog of artificial intelligence in a thought experiment called the “Chinese room” which illustrates the problem. It was intended to debunk the idea that a machine of merely mechanical parts
could “understand” something. In one permutation of the experiment, a group of English-speaking individuals are in a sealed room and provided with the “mechanical” rules for translating Chinese into English. Each person does a small portion of the distributed task. As Chinese words are fed into the room, an English translation slowly emerges at the output end of the room. It may take considerable time and many people, but the task is imaginable. They simulate a powerful computer that may someday be able to do such a task. Though the Chinese Room as a whole is said to correctly produce a translation, Searle’s argument is that no individual person in the room individually has any understanding. The individuals do not understand Chinese, but only follow the algorithm given them. Likewise, the silicon parts of a computer do not understand either. Thus, Searle concludes, neither the Chinese Room nor the computer can have a mind.

How can parts make up an intelligence without each part “understanding” and yet the whole does “understand”? Much ink has been spent on this and the resolution of these questions—if possible—is certainly beyond the scope of this paper. But it may be helpful to look at how the central issues have been dealt with. Minsky (1985) makes the following claim—that mind must be made of multiple simpler parts:

[A]ny brain, machine, or other thing that has a mind must be composed of smaller things that cannot think at all. (p. 322)

Dennett (1991) argues this same point by showing the fallacy of the converse. The converse is our folk notion of the “self.” The self is the smart part that makes us smart on the whole. The self, according to this notion of subjectivity, collects sensory data from the outside world and composes an image on a kind of internal movie screen. Then the self looks at and experiences this image. Though the data is plural, it is integrated by a singular self. The self understands the data. But this leads to a problem. How does the “self” operate internally to “look” at what is shown on the little internal movie screen? Does the self also collect data, project it onto a still smaller movie screen and then look at it? And how does that occur? Yet another self? Each homuncular self must be explained
by one more homunculus who dwells within it. This leads to an infinite regress of ever
littler movie screen watchers, who are ultimately never explained.

To Ornstein (1991) the mind is a group of “simpletons.” It is not directed by some
central authority. The interactions of these simpletons lead to what we experience as our
unitary selves. Dennett (1991) also concludes that understanding is achieved through the
interaction of smaller systems that do not understand:

If...we are materialists who are convinced that one way or another our brains are
responsible on their own, without miraculous assistance, for our understanding, we must
admit that genuine understanding is somehow achieved by a process composed of
interactions between a host of subsystems none of which understands a thing by
themselves. (p. 438-439)

Bateson expands this idea to claim:

In many cases, some parts of such an aggregate [mind] may themselves satisfy all the
criteria [of mind], and in this case they, too, are to be regarded as minds or subminds.
Always, however, there is a lower level of division such that the resulting parts, when
considered separately, lack the complexity necessary to achieve the criteria of mind.
(Bateson, 1979, pp. 92-93)

At some point—if we intend to explain mind at all—we must be able to explain it in
terms of non-mental parts. This conclusion has significant consequences. If mind must
always be made up of smaller mindless parts—if it must be emergent or else
unexplainable—then emergence may be “mindful” at other levels than just the human
mind. If mind can happen one place, why not others? This is Bateson’s (1979)
argument—that biological evolution shows the properties of being a mind in its own
right. My argument here is that organizational culture is also analogous to biological
evolution and also has the emergent properties of mind that Bateson describes.

If smart wholes are made of dumb parts, then perhaps dumb parts can make smart
wholes. Maybe the processes of individuals, without intending to, can make a smart
whole we would call an organizational culture. A difference between the brain and an
organization is of course that organizations are made up of parts that are intelligent in
their own right. The individual humans in an organization are in some respects much
smarter than the mind of the organization. So how can we make this analogy with the quest of artificial intelligence, which emerges from entirely unintelligent parts?

The individuals in an organization are indeed intelligent, but they are solving different problems than the organization is. This is basic to the idea that the organization is an emergent level distinct from the cognitive activities of the individuals who make it up. Organizations cannot solve differential equations except on the level of individual performers. However, organizations can maintain a self-regulatory process that would be beyond any mathematical model, all without any “knowledge” of formal mathematics. Organizations are a different kind of intelligence. By analogy, free market economies seem to solve problems of distributing goods, services and wealth—admittedly to the variable satisfaction of the participants—in a way that a humanly controlled command economy has yet to successfully manage. The free market system solves some problems that central planning by individuals cannot. The complexity of the tasks is far beyond the capacity of individuals to understand, yet the process occurs automatically, as if by an “invisible hand”.

It seems fair to say then, that organizations and individuals work on different problems and in different ways. Organizational learning needs to be explained in a way that goes beyond adding up what individuals learn. And individual learning does not obviate the need to explain organizational learning as emerging from the interaction of parts that are not individually “understanding” what the organization is learning.

An expansion of the AI argument is the idea of Distributed Artificial Intelligence (DAI). Here the claim is that artificial intelligence is best modeled by a decentralized system of smaller distributed processors. Instead of all processing being done by a central processing unit, lots of small quick processors work on parts of a task simultaneously. Ultimately the central control function might be minimized until it hardly exists at all.
This idea has already been applied to organizations by J. Roberts (1964). In this conception, a cultural group has a widely distributed memory, much like a parallel distributed processor computer. Hutchins (1991), (who cites J. Roberts extensively) sees social cognition as being like AI’s “connectionist net” computers. Weick and K. Roberts (1993) also develop a similar model in discussing how aircraft carrier flight crews as a system can land an aircraft where no single individual could reliably do so. Weick and K. Roberts describe the dilemmas and solutions very well. Yet they explicitly avoid the realm of distributed processing that is neither conscious nor pre-planned. (Of course consciousness and pre-planning imply a significant amount of centralization in at least some portion of the process.) This unplanned process they call “group development” and they claim that it must occur by some other means. In contrast, I am claiming that organizational culture operates as exactly this kind of distributed artificial intelligence. It would be no way to land aircraft. However, there is evidence that organizations process this kind of information in such a parallel distributed way (Cook & Yanow, 1993).

**Logical Type**

To conclude this chapter, I want to review briefly Bateson’s conceptual interpretation of Russell’s “logical typing”. This is the crux of Bateson’s sixth criterion of mind and of my description of emergence.Missing the point about levels of logical typing will prevent us from seeing the group level learning that occurs.

It is of course tempting to align with the individualistic position described by Allport (1962): 

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7 Kelly (1994, pp. 8-10) actually claims to describe exactly this, the landing of a simulated airplane by the “swarm” mind of a large group. The experiment is done by Loren Carpenter in an auditorium with nearly 5000 individuals. But the results are not very satisfactory: the plane does a roll rather than land, but it seems to intend to roll. This is certainly not the precision required for landing a plane on an aircraft carrier as described by Weick and K. Roberts.
No matter how closely we look, we can never actually experience any group agent who is performing such [group level] action. If we point to, or try to touch, the group, we are doing nothing that can be distinguished from pointing to or touching individuals. (p. 4)

If we point to or touch individuals, it is in turn true that this cannot be distinguished from pointing to or touching bio-molecular processes. We have great difficulty pointing to the soul of the person and likewise pointing to the groupness of the group. We can describe either at length, but if there is no faith in the occurrence of the higher level phenomenon, then groups are just people and people are just biology. If this is so, how can we talk about the group level doing anything.

When we look first for learning that changes individuals we risk not seeing how the group level is changed. But once we see the group level as a population of representations of itself, we can imagine a dynamic by which that population of representations learns. This is possible even though group level learning occurs through changes in representations that are carried only by individuals. It is in this way that the concept of logical type is fundamental to connecting the levels of the individual and the group.

Logical typing is always implicit in a model of selection by consequences. Though trials occur as singular events, it is through the “class” of all trials (the next level of logical typing) that learning occurs. Each trial in itself only affects learning by its consequence on the population of trials. When the population of results is considered, then the group level has learned. Logical typing is similarly implied in part-for-whole coding. Each trial in a process of selection by consequences is a “part” which experiments on behalf of the whole. Successful trials thus carry information about what worked out of the whole population of trials. In this way they code information about the whole. This may also be true if there are types of part-for-whole coding that are not based on selection by consequences. Axiomatically, if the part codes the whole then it bridges the two levels. This is because the interaction of parts containing the whole is equivalent
to the parts of the whole interacting. Emergence can thus be described as a bridging from the level of parts up to that of the whole.

Now that I have set out these three criteria (process, not substance; circular/iterative causality; part-for-whole coding) they can serve as a framework to see precisely how a model of organizational-level learning might work. Bateson’s evolution example suggests that evolution is paradigmatic for how process emergence occurs. I will develop a “selection by consequences” model of organizational learning that meets the three criteria above.
Chapter III: A Stochastic Model of a DSR

The concept of selection by consequences, (or natural selection in the specific case of Darwinian evolution), may be one of just a few ideas that truly constitutes a paradigm shift in thinking from ideas about mechanical causes to ideas about relationships. As illustrated in the section on circular/iterative causality, selection by consequences suggests an entirely different perspective on causality than our everyday mechanical metaphor. In this chapter I will make this dynamic process the cornerstone of an explanation of learning in a distributed self-representation.

Stochastic Defined…in Terms of Evolution

A broader, more formal term for “selection by consequences” is “stochastic” process. Stochastic process is probably most easily understood through the familiar example of biological evolution. This is generally called a Darwinian process. For this dissertation, the term “stochastic” is preferred over “evolutionary” or “Darwinian” because it is less ambiguous. “Evolutionary” in an organizational context suggests any slow moving process of change, as well as the more specific biological analog intended here. It also suggests connections with Weick’s (1969) evolutionary model, from which this model is distinct. The term “Darwinian” is somewhat accurate, though it is ambiguous due to the changes in “Darwinian” theory during and since the time of Charles Darwin. The introductions of genetic theory, population genetics and the synthetic theory add detail that goes beyond the simple analogy of replicators being drawn here.

Darwinian processes of biological evolution are certainly stochastic, but stochastic process is a more general term at the same time that it is more accurate. Stochastic process has an abstract logic of which biological evolution is an example and it is this abstract logic that I want to use here. I could continue with the phrase “selection
by consequences”, but it makes the text cumbersome. The term stochastic also has the advantage of being the term which Bateson uses and Bateson's work continues to be the basis of much of what follows.

There is a downside to the term. Stochastic is used in a variety of sciences in a more specific way. It often involves quantitative modeling, which is not a part of this project. Though quantitative modeling can be extremely useful, I am interested here in demonstrating the stochastic logic. Quantitative stochastic models of organizational culture are at best very premature. Quantifying a model usually requires some assumptions and simplifications that could seem mathematically permissible but would pose the danger of obscuring the qualitative logic rather than illuminating it.

Focusing on the qualitative logic, biological evolution is not being suggested here as an analogy. As an analogy there are too many points of superficial divergence to be very useful8. Biological evolution is being advanced here as a homology. I am suggesting that there is a common logic or process involved in both, which I (and Bateson) call “stochastic”. Stochastic process is paradigmatic of how information can “make a difference” (Bateson & Bateson, 1987) in G. Bateson’s words. By this process, I suggest that information can produce the emergence of a cybernetic feedback loop with its own autonomy.

“Stochastic” may be best defined as a trial and error process. Though Calvin (1989) does not use the term stochastic, he describes the stochastic logic as the “Darwinian two-step” of randomness and selection. Bateson (1979) describes it in the example of biology in terms of mutations and elimination:

I shall assume…that mutations,…randomly generated, are stored in the mixed gene pool of the population and that natural selection will work to eliminate those alternatives which

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8 As an example, reproduction is critical in biology, but the DSR model will have no direct correlate to this. The broader logic of relative enduring versus perishing does apply.
This simple logic begins to explain the evolution of biology, in all of its complexity. To further describe stochastic process, it is helpful to look more deeply at the way this process operates in biology.

**About Stochastic Processes in Biology**

I will first illustrate the principles of stochastic process in the case of evolution. Biological evolution can be kept in mind as a kind of grounding example as I proceed. As mentioned above, stochastic process in biological evolution works through an interplay of genetic variation and selection. By trying many things (variation) and harvesting the successes (selection) this stochastic process can “learn”.

I think that it is helpful to see biological evolution in terms of three stochastic elements. The first is the unit of selection. Dawkins (1982) asserts that the unit of selection in biology is the gene, not the phenotypic individual. I can also describe the second and third stochastic elements respectively as the population of these units of selection and the selection criteria. By keeping these three stochastic elements in mind, I can more easily compare different stochastic systems.

**The Three Elements in Biology**

In biology, the unit of selection is not the individual organism, but rather what Dawkins calls the “selfish gene.” Dawkins’ point is that genes serve themselves, not their phenotypic living organisms. This is counterintuitive, since the results of evolution are seen in seemingly better adapted individuals. But it is actually better adapted genes that are replicating. Dennett (1991, p 202) suggests an amusing analogy: Perhaps “a scholar is just a library’s way of making another library.” The quip actually dates back to Samuel Butler—who observed that a hen is an egg’s way of making another egg. Perhaps the
problem is quite literally one of which came first: the chicken or the egg. Genes and their expression are an iterative and circular process. It technically has no beginning or end. When speaking of evolution, it is a teleological error to say that one part of the process is using the other parts to some specific end. The “end” to which the entire process tends is merely the replication of the process itself.

Despite this circularity, there is some sense in which Dawkins is right to claim that genes, and indeed all replicators, are selfish. He calls replicators selfish because they respond only to their own success. They do not care about the fate of their phenotypic shadow selves so long as they replicate. According to Dawkins (1989), the phenotype is merely the “survival machine” that the gene has designed. It is only the genes’ reappearance from generation to generation that establishes their success, and they cannot reflect the success of their survival machine on any other level than how it helps themselves. All they “know” is that they made it another generation.

This personification of “selfish” replicators lends itself to attributing forethought to replicators. We know that this is a trap. It is precisely the point of a stochastic model that forethought is not needed. Replicators are not conscious planners. But if we do try to establish where the control of the process is, control seems to be in the coded information held in the genes. Replicators transmit information about what worked from one generation to the next. In Bateson’s terms from his fifth criterion, they are “coded versions” of what went before. Does that make them the center of the process?

We can untangle this further if we look even beyond the replicator itself, as a physical bit of DNA or whatever, and consider the information coded there. Survival of the gene as information is what is passed on and drives evolution. To extend that

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9 The term selfish suggests their being self-interested, but really the usefulness of that expression is in pointing out that they do not have some other entity’s interests at heart. Their own survival is the only criterion of their behavior, and they do not even “care” about that.
perspective, we should probably say that it is the information on the gene that is a selfish replicator. The gene as the chemical DNA is as arbitrary as the individual carrying it. What is non-trivial is the information about a past generation that is coded there. And information is in itself unable to be selfish. But given a stochastic process, it is the information coded on replicators that seems to advance its own survival. It is information about what worked, and by working, it communicates what worked. And conversely, by communicating what works, it is working.

The selfish replicator is actually the information about what worked. Given that information is non-substantial, it becomes tempting to identify the nearly equally abstract coding of the information as the replicator. However, we are better served if we think of information as a process. It is the replicating process that is the selfish replicator. This seems very abstract, but it does keep us from attaching the status of a forward thinking agent to one or another part of the process or to any of the physical manifestations of the process.

In the purest abstract logic, I want to capture this way in which information itself seems to tumble uphill—metaphorically that is. It does so only by knowing which way is up. It discovers which way is up by seeing where it tumbles. This entropy-defying mystery is the subject of open systems theory. It is also the apparent magic that Bateson is referring to as the “pattern which connects”. This is a pattern that is entirely self-contained. There is no outside control, nor is there an outside criterion of success. This has long been a problem in describing biological evolution, that it is tempting to claim that evolution is an improvement in terms of some external measure. I am not ignoring the “external” nature of an environment here. In terms of their environment they do achieve a better “fit.” But I am actually including the environment as an “internal” part of the process. The kind of external control that I am explicitly denying is on the order of a divine intervention or moral judgment. A certain evolutionary change is not morally
imperative, nor is its non-occurrence a “problem.” Though we will inevitably judge 
biological evolutionary changes in terms of how it suits us, these are processes that 
nevertheless occur only for their own sake (or no “reason” at all). So to retract my own 
metaphor, the sense of “uphill” is only an acknowledgment that some “selected units” 
manage to endure, and uphill is no better than “downhill.” What is interesting is that 
evolution seems to take a “direction” at all.

With that framework in mind, I can introduce the second element of a stochastic 
system. The population is composed of all of those members of a species (the units of 
selection) who are interacting and potentially reproducing. Significantly, it is the 
population that learns from the environment by its shifting concentration of different 
genesis. It is important to remember that individuals of a species never themselves evolve. 
The population carrying a gene pool is the level at which learning or evolving occurs. 
The population is considered the “unit of evolution” or could be called the “level of 
learning”.

This is absolutely critical to understand that learning does not occur at the same 
level as selection does. The contrary theory would be a Lamarkian evolution which 
paradoxically requires that the individual learn first and then pass on that learning to its 
progeny. In that case, we would not have the foundation for a general theory of learning 
(such as Bateson’s) that can be applied to organizations, since the question of the nature 
of learning has been presupposed. Biological evolutionary learning is not internal to the 
organism but intrinsic to the processes within the population of those organisms.

Finally, the selection criterion is simply successful replication. In the biological 
case this is assured by reproduction. All of this allows a population to become better 
adapted to its environment by its containing a larger concentration of genes and hence the 
phenotypes that worked in the past. Reproductive successes (selection on a criterion)
between organisms (units of selection) allow the species (population) to adapt and “learn.”

The Three Criteria of Process Emergence Applied to Biology

Now, I can apply the three criteria of process emergence from Chapter II to my example from biology. I will show how biological evolution is an emergent process. This is similar to Bateson’s project in *Mind and Nature*, but using the three criteria developed above rather than Bateson’s six criteria.

**Process, not substance.**

Evolution is certainly a matter of process rather than substance. This is tied to the idea that there are no essences in biological evolution. Although it is tempting to think of a typical example of any species, there is actually no single carrier of a species at any moment in time. Instead, the gene pool carries the population of genes that define (the range of variation constituting) that species. This is a helpful perspective to get past the notion of a species in terms of things. A species might more properly be considered in terms of its ability to procreate internally to continue a diverse pool of genetic information. Without this process, the idea of a species makes no sense. Further emphasizing the process nature of evolution, we can look at the causal links between the individual and the population. Notably, these links are very indirect.

There is no direct causal link of individuals affecting the population level. They can influence the population only through their own selfish replication. Conversely, the population affects the individual by being the only means by which replication is at all possible. The two are completely intertwined. Yet, they are not two substances acting on each other. Nor are they in a dialectical relationship as two first causes. All causality is manifest through the interaction of their processes. The nature of these processes is of course that they are circular and iterative.
Circular/iterative causality: Selection by consequences.

Circular/iterative causality is probably the major focus of evolutionary theory. Skinner’s idea of selection by consequences is a broader attempt to show this principle in a context besides biology. The revolutionary and controversial aspect of this concept is the idea that evolution can proceed without some teleological purposefulness. Evolution was not driven by some Aristotelian “final cause”. Here is a process where ever better environmental fit is achieved without any intention to accomplish it.

Our usual reaction to this possibility is the one articulated by Paley (1802) in the metaphor of the watchmaker. His “argument from design” was basically that anything so artfully crafted as a biological species proved in itself that it must have had a designer. If we see a watch, we presume a watchmaker. We imagine that the watch could not have been created “blindly.” Yet, evolutionary theory would have us accept just exactly that. Evolution is in Dawkins’ (1986) terms, like a blind watchmaker. A system designs itself without a designer. In terms of the language used here, we could say that a system indeed learns, without a learner.

The explanation of this is of course in terms of stochastic process. Because causes are circular and iterative, the effect of one cycle can change the next cycle of the process. When we look at a long series of these cycles, it appears as if the cycles are changing themselves. In that way they seem to cause themselves. An emergent level appears so that biological evolution has its own autonomy.

Notably, learning always occurs after the experiment. Our usual conception of mindful activity is that thought precedes action. But in this case, the “information processing” or “reduction of equivocality” (Weick, 1969) occurs after action and is only possible because of it. (This is also consistent with Weick’s (1995) concept of retroactive sensemaking.) Thus, stochastic process has that peculiar blind quality to it. A learning
system does not have to (and cannot) know how it is going to solve a problem. It merely tries a great number of solutions and the success and failure of those tells it how the problem is to be (has been) solved.

**Part-for-whole coding.**

Individuals do not themselves evolve, only populations do (Dobzhansky, 1962). We need to make the distinction in biology between the unit of selection, (the information on a gene), and the population of that gene in a gene pool. Genes never learn, but the process of evolution can be viewed as the learning accomplished by a population of genes. This learning is accomplished through the population’s feedback coded in its parts, in individuals and the genes they are carrying. The population remains the “unit of evolution” and the “level of learning”.

Evolutionary theory seems to satisfy the three criteria I have set out for an emergent process. Cognition can also be seen as a stochastic process. This “learning” can occur at the individual or cultural levels. First I will look at cognition stochastically at the individual level, then I will adapt this model to the cultural level of organizations or groups.

**Stochastic Process as a Model for Cognition**

The advantage of a stochastic model of cognition is that it might account for cognition without recourse to some internal homuncular consciousness that simply is conscious and hence cognitive. Cognition can be explained in terms of processes that do not implicitly beg the question by being cognitive in their own right. An explanation of cognition needs to be self-contained. It cannot sneak some external cognitive quality into the equation at the last moment. This is similar to the task of explaining the origin of species without recourse to external intervention (such as a divine plan). The process is explained with what is already there. I will address this more later.

Though the model developed here will have several significant departures from Calvin, Dennett and Dawkins, I will use Dawkins’ meme concept to develop an organizational level model based on stochastic dynamics. As Bateson’s project was to discover mind in evolution, this project is to discover mind in the organization. Ultimately, the three areas of individual cognition, organizational learning and biological evolution are all homologous. I will look first at the homology between evolution and individual cognition. Then I will adapt this model to the cultural level.

We saw that evolution is stochastic. Now we can look at individual cognition in the same terms. It is possible to do this if we look at both cognition and evolution as processes involving what Dawkins calls “replicators”. Replicators are what Dawkins finds as constant across any stochastic process. “Replicator” is just another term for the unit of selection in a stochastic system.

**Memes as Replicators**

As noted above, Dawkins sees replicators in the generic sense as the key to biological and any other kind of evolution (1976; 1982; 1986). Before DNA replicated there may have been simpler clay crystals (Dawkins, 1986) that did so. Almost in passing, while discussing biological evolution, Dawkins raises the possibility that
cognition relies on a Darwinian (stochastic) process. Besides biological genes, Dawkins proposes that there is also a stochastic process analog that accounts for cognition. Dawkins has dubbed the cognitive analog of the gene replicator a “meme.” Memes are said to compete, be selected, survive and so forth in a process similar to biological genes. Although Dawkins approached meme theory as a tangent to his biological theorizing, meme theory\textsuperscript{10} proves to be a powerful evolutionary analog to cognition.

We saw how biological evolution fit the three criteria. Following Dawkins, I presume that cognition fits the three criteria in his meme theory. Now I want to expand the meme theory to the organizational level. If I can show that an organizational level phenomenon such as organizational culture fits the three criteria, I have a basis for claiming the emergence of this level.

**Memes as Social, Superorganic**

An important aspect of meme theory is that it presupposes that memes are social. Dawkins would probably be comfortable with the social cognition theorists (Resnick, Levine, & Teasley, 1991) in this respect. Memes extend past the boundaries of cogitating individuals in order to account for an evolutionary process of memes at the cultural level. Otherwise, each individual would need to idiosyncratically reinvent a process of language and perhaps thought—not a likely occurrence. Memes, as a unit of thought, are necessarily social.

This quality of memes—that they are social—sets them apart from individuals as “superorganic”\textsuperscript{11} (Kroeber, 1949). Given the social basis of memes, meme theory seems

\textsuperscript{10} A caveat is in order here about the concept of a meme. A “meme” is best considered as a heuristic rather than a strictly observable object. Although a gene has a clear physical manifestation, a meme is at this time (and perhaps forever) merely an inference. We should be careful not to let the idea of a meme become reified prematurely.

\textsuperscript{11} Penrose (1989) claims that this superorganic nature of emergence is another kind of dualism. But he is confusing processes and things. Descartes’ belief that mind was one of two types of \textit{substance} leads to
a good choice to describe organizational culture. Memes are the stuff (or process) of an emergent level besides the biological. They go beyond the biological bodies of those who harbor them to a larger social substrate.

Indeed, memes are in many ways extrinsic to human beings. Certainly they are dependent on humans, in the same way that certain viruses and bacteria are. This does not make them human, and humans could presumably live without memes as well, though we might be ambivalent to call such an asocial being a “human.” Memes are like symbionts in humans, and Dawkins claims that parasitism might be a good metaphor for memes. Like genes, their only criterion of value is that they survive. They are successful by propagating themselves, not their human hosts. There is even the possibility that some successful memes can be harmful or fatal. Consider a “David Koresh-lethal cult leader” meme. For some time this meme may have been very successful (on its own terms). Yet—at least from a biological perspective—it was not operating in the best interest of those who harbored it.

Not only are memes superorganic (and selfish), theoretically they may be independent of humans. In the not too distant future it may be possible to create memes that do not depend on human hosts at all. Artificial life (self-replicating information with artificial evolution) is perhaps easier to create in a computer than artificial intelligence is. Kelly (1994) cites work by Tom Ray on computer “organisms” that not only replicate (as do computer viruses) but actually mutate and develop an ecosystem with other computer strains. Some of these artificial lives actually adapted parasitic relationships with their cohabitants. So far this is a “petri dish” occurrence, but it points out the theoretical

many difficulties, not least of which is how the two substances interact. Process, however, is separate and different from substance without postulating another type of substance. The interaction of processes that create emergence is the subject of this paper and I contend is not problematic as a dualism. In fact it potentially offers some resolution of the problem of Cartesian dualism.
independence of memes (if that is what software code is) from biological life.\textsuperscript{12} Replicators may potentially have many non-biological forms. My thesis here is that replicator-based stochastic systems could include organizational cultures as well. My next goal is to model a dynamic for how memes can account for organizational culture.

**The Social Basis of Memes vs. The Context of Organizational Culture.**

All memes, as we experience them, stand apart from the biological individual. They must at some level be “shared” with other humans. Very little meaning can be expected to arise out of an unsocialized individual alone. Making meaning, of which memes are the medium, is almost invariably cultural. In this sense, memes always derive their meaning from the cultural sphere. However, not all memes are always operating at the cultural level nor are they always about the cultural level. So far as operating at the cultural level, clearly much happens that we would call individual cognition—which although based on culturally derived memes, still remains intrapersonal. The more important distinction is that not all memes are about the cultural level. Only memes about the organizational culture are relevant to creating the organizational culture. This distinction of organizational culture memes from other memes requires that we look again at the role of context.

If memes are roughly conceptualized as ideas, then the memes that make up organizational culture are those that relate directly to the organization. These memes are contextualized by the organization. For example, a personal opinion about entrepreneurial spirit is a meme. It may be related to “culture”, but it is not necessarily relevant to a

\textsuperscript{12} Kelly’s interest in this is related to the major theme of Kelly’s book, that mechanical and biological life are only artificially separate. He predicts that they will proceed to merge and blend in the future: “The apparent veil between the organic and the manufactured has crumpled to reveal that the two really are, and have always been, of one being…vivisystems.” (1994, p. 3)

This quotation is helpful here in acknowledging our basic premise, that concepts about replicators should include some beyond just the genetic ones.
particular organizational culture. It is not yet an organizational culture meme even if all of the members of a work group share this same opinion. An organizational culture meme arises when that opinion is contextualized by a group. The meme that “this is a place that values entrepreneurial spirit” is a part of an organizational culture. This organizational culture meme is a part of the representation of the organization. As in Allport’s structurogenesis model, it is the interaction—including all of the parties, not just the individual actors—that is represented and later repeated. Organizational culture memes (OC memes) will henceforth be defined as those memes that are contextualized by the group or organization deemed to have this culture.

Notice that an OC meme does not have to be about the organization directly, it just must be contextualized by it. OC memes about an individual’s behavior would seem to be about the individual, rather than the culture. An example might be: “He doesn’t have an entrepreneurial spirit.” However, they are OC memes in so far as they are about that individual’s behavior in the context of that organization, e.g., “He doesn’t have the entrepreneurial spirit that we value here.” This is what makes them a part of the representation of the organization and not simply about that individual. An OC meme has to code the whole; it has to be about the organization in order that its interaction with other memes can constitute a learning process at the organizational level.

The Meme as Unit of Selection

We now have the background for a meme theory of organizational culture. According to Dawkins, memes are by definition capable of a stochastic process that accounts for cognition. Furthermore, I am claiming that memes are social and can be contextualized to the organizational level. This allows us to escape from seeing individuals as the primary or perhaps only level of cognition. A model of the interaction of memes that are contextualized by a group or organization will give us the organizational level theory that I am seeking. If a process of memes can be discovered at
the group level, this might constitute a group level cognitive process. Before I do that, Dawkins’ theory of memes needs to be explored.

Dawkins’ model of memes works well in many ways. I will look more closely at his model, and at the same time look at some of the flaws involved. With those, I will reaffirm the importance of the three elements of stochastic process and also develop the model that will be applied to the level of organizational culture and learning. Central to Dawkins’ model is the meme as a unit of selection. What we might like to know is what selection criteria are applied to memes. It defeats the entire model if we say that the selection criteria involve the survival of the genes supporting the biological being carrying the meme. In that case we would do better to focus on the gene as the replicator and unit of selection. Meme selection is not based upon the biological survival of the carrier. Memes must compete on their own terms against each other.

To define a selection criterion, Dawkins draws an analogy from genes. In one sense, genes can be said to be competing for a specific site on a chromosome against other versions (alleles) of the same trait. The gene for blue eyes can take that spot, or the one for brown eyes, but there is only room there for one gene. Perhaps, he suggests, memes compete for memory or for processing time in the brain. These might be in limited supply, much as they are in a computer (Dawkins, 1976).  

This analogy leads us to a fatal error. The selection criterion has become external to the process. It appears that something apart from the meme’s interaction with other memes has intruded into the process. Dawkins’ model now suggests that there is a decision whether a particular meme gains or loses brain resources. Dawkins (1976, p. 193) suggests that certain memes have “great psychological appeal.” The example he

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13 Though genes have to deal with this physical limitation of chromosomes, it does not follow that memes have to compete for physical assets in the brain. Competition may be on other grounds, as will be shown below.
chooses seems to make a plausible case for this. Dawkins describes the meme for “blind faith” which seems to protect itself from doubts about its value in a reflexive way. The content of the meme is specifically to not doubt the veracity of the object of faith. Hence, the more blind faith is tested, the more entrenched it becomes. We could imagine that this is how this meme achieves its psychological appeal.

I think that blind faith is probably an unusual sort of meme in this respect. Dawkins’ examples of other memes’ strategies focus on memes related to faith, including God, the church, hell fire, religious art and so on. These memes benefit by the reflected protection of the faith meme. But perhaps most memes are not capable—in the way faith is said to be capable—of insisting on the importance of themselves and their closely related memes. Empirical data are specifically and intentionally to be ignored with faith. Blind faith seems to take a specifically hostile stance against particular other memes. It attacks even the idea of empirical data. What seems particularly odd is how blind faith seems to reflect back on itself. Here is a meme containing an injunction that its own veracity is not to be challenged. It can do this because it is blind faith, and that is what blind faith requires. Of course there is some back up from the hell fire meme mentioned above. However, this connection is itself protected from scrutiny.

If we look closely we can see the structure of a double bind (Bateson, Jackson, Haley, & Weakland, 1956). There is a primary injunction to believe the “article of faith.” A secondary injunction enters from daily experience by suggesting the possible falseness of the first, and thus contradicts the primary injunction. The third injunction prohibits noticing the contradiction between the first two. The first and third include a serious threat of punishment.

When we do this analysis, we see that blind faith is not actually a single meme, but a small memic system of several interdependent memes. They are so tightly interwoven as to be describable as a single meme by Dawkins. What gives each part its
“psychological appeal” is its tight interrelationship with the other parts. I am going to suggest that this interrelationship—the fitting together of memes—is the actual selection criterion. So-called “psychological appeal” is a function of fit in a larger system.

There is a good reason why we must abandon the idea of psychological appeal in favor of fit as a selection criterion. Intrinsic in the idea of psychological appeal is the notion that something appeals to some other agent in the mind. If biology had recourse to such a concept, we would be hearing of a “life appeal”. Individuals and species would be granted habitat, food, and most importantly reproduction by virtue of their appeal to this appeal-detecting agent. A God would enter the system to decide which were most fit to survive based on some external criteria. But there is presumably no such agent making these decisions. The “appeal” is to other parts in the system, not to an external agency. The beauty and essence of a stochastic system are that it is regulated by the internal interaction of its parts. Little is gained with the idea of “psychological appeal”, and the principle reason for adopting the concept of a meme—the stochastic process—would be compromised.

By backing up from Dawkins’ error, we can generate a far more robust and plausible model. Dawkins comes to see co-adaptation as a secondary selection criterion. This is indeed how “hell fire” and “blind faith” aid each other. I would like to invert this and suggest that co-adaptation is the primary selection criterion. If there is any psychological appeal, it should be at the simple level of something like avoiding direct contradiction or maintaining logical consistency between memes.

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14 There does seem to be an appeal of ideas apart from their logical rigor. Most notably, memes that contribute to our own sense of self-esteem tend to have an advantage. The ubiquitous bias toward that which flatters us needs to be accounted for. There are two points to make on this. One, it probably can be accounted for in terms of acknowledged psychological motivations, rather than an idea like “the appeal of faith.” Second, it is not fatal to the model here if it is not accounted for. As long as fit is a substantial criterion, the model to be developed below will work.

15 In fairness, Dawkins himself seems to see the need to back up from the idea of an external appeal detector and acknowledges the deep significance of co-adaptation among memes.
The DSR Model

A model of the interaction of memes that are contextualized by a group or organization will give us the organizational level theory that I seek. If a process of memes can be discovered at the group level, this might constitute a group level cognitive process.

At this point the main elements of the DSR model are already in place. I will describe a way in which OC memes—which are contextualized by the organization—interact at the group level. Their interaction constitutes a group level learning process. More specifically, OC memes representing the organization compete for meaningfulness among a population of such memes. We otherwise know this population of OC memes as an organizational culture. Selection is based on the sensemaking fit with other already extant organization-representing memes. The population of these memes changes in the way that a distribution of genes changes in a biological population (gene pool). As in biological evolution, we can conceptualize learning at the level of the population. Thus, these changes in the population of OC memes represent the group level learning of the organization.

In this section I will elaborate this stochastic process for how organizational culture evolves. This allows us to understand the emergence of an organizational process—organizational learning—from individuals’ processes. As described above, stochastic process seems to need to have the three stochastic elements: a unit of selection, a population of those units, and selection criteria. We can describe OC memes in terms of these three stochastic elements. As suggested above, I will start to differentiate a slightly different perspective than Dawkins on what constitutes these three stochastic elements of the system, but much is borrowed from him.
This is where it will become clear what is meant by “distributed self-representation.” A population of OC memes is precisely the distributed self-representation I have been alluding to. The stochastic interaction of the parts of this self-representation is what makes the organizational culture able to learn.

**The Unit of Selection**

A single OC meme is our unit of selection.\(^1\)\(^6\) It is important to remember that the unit of selection is not the individual organizational member as a person. I am talking about interacting processes and in this case that refers to the OC memes carried by individuals. It is helpful to think of an OC meme as part of one individual’s representation of the cultural grouping on just one dimension. The individual’s representation of the group is actually multidimensional. We could conceivably interact with one person’s OC meme about entrepreneurial spirit without necessarily involving an OC meme about business ethics. Each is a somewhat independent dimension of a culture. It helps to make a distinction between the many different dimensions of a culture that an individual is enacting at any particular point in time.

I also want to maintain a distinction between the distributed self-representation (at the culture level) and the part that each individual carries. A *component* representation is that part of the DSR held by one person. It is a component of the distributed, cultural level representation. This representation is held by one person, but covers many dimensions of the culture. So, the unit of selection, looked at atomistically is an OC meme. An OC meme is one individual’s representation of the group on only one dimension. A population OC memes across individuals makes up a dimension of a culture. A component representation is a collection of OC memes on different dimensions

\(^1\) Though an OC meme seems like a thing, it is not. It is of course a complex process in its own right.
for one individual. Figure 1 shows the relationship between dimensions and levels of a distributed self-representation.

<table>
<thead>
<tr>
<th>Dimensionality X Level</th>
<th>Level</th>
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<tbody>
<tr>
<td></td>
<td>Individual Level</td>
</tr>
<tr>
<td>One Dimension Alone</td>
<td>OC Meme.</td>
</tr>
<tr>
<td>All Dimensions together as a Representation</td>
<td>A Component Representation, the individual’s part of the DSR.</td>
</tr>
</tbody>
</table>

**Figure 1: Key Definitions in terms of Dimensionality and Level**

It might be noted that there could be substantial interaction between OC memes within an individual, even if these memes are on different dimensions. For example, business ethics might impact entrepreneurial spirit. Different dimensions of the person’s representation of the group need to be somewhat coherent for the same reason that they are going to be coherent across individuals. In this way, OC memes will meet challenges both internal to the individual and from the OC memes of other individuals in the group.

This phenomenon of the evolution of OC memes within one person needs clarification. It is tempting to say that the individual is the level at which meme evolution occurs. A change in the population of OC memes within an individual is certainly something of a learning process. It is even possible to say that individual learning occurs by a similar process.\(^{17}\) An individual no doubt can carry a changing population of OC memes evolved within them. I do imagine that memes evolve at the personal level, but that this individual learning is only a small part of cultural evolution. The process is probably similar in the following way. An individual can have several competing or even contradictory ideas about the culture on a particular dimension. Each has to fit with the whole cognitive sphere of that individual. In that way, they must compete. Because selection is related to coherence between memes, selection of memes could occur within the individual (Calvin, 1989; Dawkins, 1989).

\(^{17}\)
memes “internally.” In Dawkins’ model, this is how an individual would “think” about an organization. However, I am more interested in the cultural level. How does what is called the “shared representation” evolve? How, amongst many individuals, does the population of OC memes evolve? Only the interaction of memes that are contextualized to the culture level is relevant to organizational culture and learning.

The Population

A population of OC memes is the aggregation of all of the OC memes held by individuals regarding the particular group on that meme’s particular dimension. It is noteworthy that this population might include OC memes held by persons external to the group who nonetheless have influential opinions about the nature of that group. When Apple began its Macintosh ad campaigns targeting IBM, it is not far-fetched to imagine that it changed IBM’s culture. Apple portrayed itself something like Orwell’s 1984 hero, Winston, against Big Brother. Members of the IBM organization could either accept the characterization or create a reaction to it. Either way, the behaviors and IBM-representations of those internal to IBM were bound to be affected. This makes an important point. Although IBM is the culture, properly speaking, the OC memes which make up that culture can be distributed more widely. An important implication of this is that many other stakeholders, including customers, should probably be considered as part of the network that carries a corporation’s culture. When Avis customers believe that Avis “tries harder”, employees are bound to be affected not only directly by their own propaganda but by customers’ new expectations. Ignoring the broad reach of an organization’s culture limits the understanding that can be achieved.

Not the formal membership in the organization but the identity of the organization brings both internal and external OC memes together to interact as a population. An organizational culture is the identity of the organization (Per-Olof, 1985). To Weick (1995), organizational identity is a critical element in sensemaking about the
organization. Schein (1985, p. 50) makes the claim that group identity and culture are virtually the same phenomenon. The organizational identity could be analogous to Dennett’s (1992) description of the self as a “center of narrative gravity”. It is the abstracted center of our stories about the organization that pulls together all of the rest of the organizational identity. Organizational identity is like a physical center of gravity, which is not at the center of a mass, but is abstracted from the collective gravity of all of the mass interacting. Though while standing on the earth we feel a large gravitational pull toward the center of the earth, we are actually being pulled by small masses distributed among rocks in New Zealand and glacial snow at the arctic circle as well as the hot core of the earth. Similarly, the self is not a single “thing” that holds a personality together. It is, according to Dennett, more like a plethora of narrative stories around a single character. The character does not exist without the many stories anymore than the earth’s center of gravity exists without the mass of the entire planet. To complete the analogy, organizational identity is not a central pulling force, though we experience it that way. Organizational identity is distributed across many individuals, including those outside its formal boundaries. Each pulls only a little toward the abstraction of the organizational identity we experience.

All of these OC memes are relevant so long as they are about the same organization and have opportunities to interact as a population. If groups (subpopulations) of OC memes were truly isolated from each other we might expect two different identities and thus representations of the organization to arise. Perhaps in a marginalized religious group, internal and external representations might come close to this degree of differentiation and isolation, but that would be rare. Usually there is a high

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18 An interesting implication of this analogy is that the boundaries of both an organization and an individual are not the same as the boundaries of where the narratives are told. Personalities and organizational identities are bounded by where both insiders and outsiders represent the boundary.
degree of influence between what insiders and outsiders perceive of an organization. Their representations interact as a whole system.

The population has to be adequately bounded for this entire model to apply. If individuals do not agree as to the identity of the organization, they can not be expected to try to reach coherence on representations of the organization. Because OC memes are contextualized, it is the expectation of a common context that brings OC memes into interaction. A population of OC memes is bounded by the expectation of consistency. If we are both talking about one organization, we expect to reach the same conclusions. If we do not, we have to explain to ourselves why we see the same thing differently. One possibility is that we are seeing different organizations—we are defining the boundary differently. This is negotiable in that we can try to define the boundary for each other so that it is roughly the same. Otherwise, we can make allowances for different perspectives and ways of looking at the organization. Taken altogether though, to the degree that we are not solipsistic, we should expect to reach similar conclusions about the organization.

Actually, we do not have to have exactly the same picture of the organization. What is more important is that we have representations of the organization that do not contradict each other. We may have different but complementary representations. I am also not suggesting that we both need to have a representation that corresponds with reality. There is no *essential* meme that is “true”. Memes are true only with respect to other memes. I believe that we are attracted to the idea of an essential meme because of the problem of how memes can insure their integrity. However, in the case of both memes and genes, integrity comes from the population, not from an essence. If a gene can interact with other genes, then they are from the same species. If two OC memes can seem to refer to the same organization they will interact and are by definition part of the same meme population. The ability to interact biochemically defines a gene, the ability to
interact about the same organization defines the same OC meme. This brings us to some other analogies from biological evolution.

Biology also has other problems with the integrity of a population. For example, a deme is a group split off from a population. This can lead to two distinct species. The two new demes must be isolated or else they would interact and create a single population. However, given isolation, they can evolve in different directions. As they do begin to evolve separately, they become two clades or branches from the parental species. This is analogous with meme populations. Concepts with a common heritage can often diverge when taken up in two different languages. Language barriers can come to provide the isolation necessary for independent evolution. This can happen between organizations as well. It could be one of many sources of new ideas. An idea that could not grow at an older organization may take root very well at an offshoot organization. Despite the fact that the cultural “root stock” is available in both places, the new organization might promote an OC meme that the other did not. This could happen because some strong tradition at the old organization makes the newer idea incongruous. Yet at the newer organization, that impediment may be missing and a new line of evolution could begin.

One situation that is not frequently noted in biology is the merging of information. Kelly (1994) suggests that this may happen in the biological world more than we recognize, but it certainly happens with memes. Two memes can be combined in such a way that they create something new. Dawkins refers to this process as “blending.” Innovation comes not just from distortions of memes but also from new combinations of memes.

I have foreshadowed a little of what comes in the next section about selection. The ability of memes to interact defines them as belonging to the same population. How they interact establishes the selection criteria.
The Selection Criterion

In one sense the selection criterion is always the same—to “survive”. In terms of memes we could describe survival with Bateson’s aphorism: “what stays true longer does indeed stay true longer than what stays true not so long” (1979, p. 206). Ultimately, longevity is its own reward and the only evidence of success. Survival in terms of organizational culture might be whatever allows an OC meme to endure. So, what makes some OC memes persist while others quickly disappear?

If we again think of a meme as something like an idea, we may have a hint at what makes an idea last: The idea appears to be true. Indeed there are other factors that can be used to enforce the truth of an idea, but cognitively, apparently true ideas are preferred over untrue ones and truth does wonders in promoting an idea. I believe that this holds even for those who admit that there are many truths existing at once.\(^{19}\) At the philosophical level this position is quite valuable, but when it comes to practical thinking, a mind is drawn toward choosing one best\(^{20}\) truth. Truer seeming truths are a fundamental differentiation in cognition. Of course the question remains about what makes an idea seem truer. In what way can a meme appear to be true or false?

This is ultimately a debate for epistemologists. Setting the larger debate aside, I would like to adopt one solution to that question for use here. This approach is sometimes called a coherence theory of truth or coherentism. Stam paraphrases Dancy in describing this position as follows:

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\(^{19}\) It is philosophically possible to accept a relativist position toward truth, but this requires a belief in the truth of that epistemological position that overrides relativism at the particular level. One’s facts can be uncertain if one is certain about the uncertainty of facts. One has thereby made a comfortable truth claim about uncertainty.

\(^{20}\) The use of the word “best” is not intended to imply a value judgment. Nor does it mean that there are not other better truths possible. In small enclaves “better” truths may even already be flourishing but with isolation they might still be unable to influence more entrenched relatively suboptimized truths.
According to coherentism, a proposition is true if, and only if, it is a member of a coherent set. … [A] proposition is true only if it enhances the coherence of our belief set. (Stam, 1990, p. 250)

Our memes are true when they work well with other memes. Lest this seems excessively relativistic, coherentism does not rule out empirical verification. Nor does coherentism make claims either way regarding the ontological reality of the empirical world. Stam continues:

A proposition in a coherent set may be empirical or nonempirical; coherentism is willing to entertain both so long as the propositions in question add to the overall coherence of a set. (p. 250)

Thus there is no need in our model to account for truth based on an external reality but only on the internal reality of coherence which incorporates whatever stance one wants to take toward the reality of empirical information. Truth is not judged by any absolute criteria outside the system of memes. This is helpful in that we do not have to show how memes get their truth from reality. They get their truth from each other. This is another way of saying that fitting together is the selection criterion.

This discussion of selection criteria is critical because I need to show that individuals do not generally plan selection, but rather, something happens at the group level. In the biological world, creatures do not select themselves, (nor presumably does any beneficent deity of Nature select them). Processes that are naturally taking place synergize into a larger selection and evolutionary process. The same must be true with OC memes. An OC meme needs to persist and increase its prominence in the population of OC memes. In a sense, an OC meme competes with other OC memes offered up by the same person and by others.

Part of Dawkins’ speculation was that memes compete for memory allocation in the brain. It must be important for a meme to have a location, but it is not clear that
memory is actually a *limiting* factor for memes. When we learn something new, it does not seem that we must forget something else. Sometimes learning more, such as associations, makes other things *easier* to remember. It again is problematic “who” would decide how much memory a meme would get and based on what criteria. That seems to call for another homunculus. In the cultural example it is improbable that anybody is directly selecting memes that are to become the shared favorites.

Mayr (1988) makes a similar error about external criteria in presuming that:

> As history repeatedly illustrates, those behaviors will be preserved and those norms will have the longest survival that contribute the most to the well-being of a cultural group as a whole. (p. 80)

Mayr is right that cultural norms do not necessarily survive by giving benefit to the individual, but he makes the mistake of believing that they must benefit the group. As in all evolutionary cases, there is some disadvantage in killing the host, yet germs and viruses whose life depends on hosts *can* kill their hosts and still survive. For a meme to survive it might behoove itself to help the group to which it belongs, but it does not have to. Schein (1985) makes the claim that “something can become a part of the culture only if it works.” (p. 213). Reinforcement is said to come from the flourishing organization. If it did not work for the organization it would not be reinforced and would not become a part of the culture. However, some OC memes may be “working” only by their own criteria for survival. If they survive by some means that do not further the explicit goals of the organization they could become a part of a destructive culture, but a culture nonetheless.

As Dawkins claims, replicators are “selfish.” Their criteria for survival must only be that they survive. In biology, though survival is often symbiotic for the “host” life, it can theoretically be hostile or fatal. One case is the problem of “sexual selection.” Some

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21 This echoes the discussion about the energy metaphor. Information, rather than resources like energy, is decisive.
genes will lead to better reproduction without bestowing any other real benefit to the creature. They will tend to prevail by positive selection despite not really aiding “adaptation” to the environment. Similarly we must expect that this is true for OC memes at times. They may confer no benefit to the group yet persist by meeting a survival criterion (fitting together).

Survival is always a question of fit with an environment (Alland, 1970, p. 32). It is actually helpful to think of survival not in terms of this particular gene fitting with this particular environment but a selection of the relationship. What survives is the relationship between this gene and this environment. Memes also have to “fit” with their environment. In biology, fitting in is often accomplished by preying on others, but the predatory ways of nature may not be as applicable to memes. “Making sense” with other memes is probably the most common “strategy” for memes. Cooperative symbiotic relationships are more likely than one meme “preying” on another. Ideas have to work together or they really do not work at all. I propose that the ability of memes to work together—to cohere—is their fundamental mechanism of selection. A meme is not simply trying to get along with human hosts, but with a vast environment of other memes. Furthermore, most memes have to roughly correspond with sensory data. Memes persist by agreeing with empirical inputs as well as other preexisting social and individual memes. In other words, like a gene, survival is contingent on a specific environment. There are no genes that persist simply by insisting (to whom?) that they persist—as the faith meme seems to do in Dawkins’ example. This point underlines the dilemma. If the faith meme appeals to an injunction to not lose faith, who decides whether or not to go along with the injunction? Who is the decider and how is the decision made?

The difficulty with Dawkins’ schema is in presuming a “meme-holder” who decides whether or not to have a particular meme. Memes cannot simply influence a decision-maker because the decision must be a memic process as well. At some level, the
interaction of memes itself must form the decision process. Memes actually work by making everything else fit together. The faith-styled maxim “God works in mysterious ways” may perhaps work in such a way. It is a self-closing hermeneutic in which any exception to the rule only further proves it. In fact, the faith meme can only work in the context of “doubting” memes. All memes are always working in an environment of other memes. The satisfying feeling of “understanding” which “faith” can offer is perhaps a good example of how the selection of memes must be operating. Faith makes everything make sense. Of course we are suspicious of it precisely because we recognize its tightly self-closing nature. I imagine most memes are somewhat more subtle in their closedness. Nonetheless, it is precisely by their closedness and coherence into a hermeneutic circle that they make sense and we feel that we understand.22

This human (perhaps physical) sensation of “understanding” described above may be a good way to think of meme selection. When a meme leads to “understanding” it pulls the whole “memosystem” together, it supports those memes that are coherent with the emerging picture, and it suppresses those that are not. Although it still presumes some human tendency to want things to make sense, this is more plausible than a more superficial “psychological appeal” of particular memes.

This is similar to Minsky’s (1985, pp. 278-279) notion that Freudian “censorship” is really a part of a larger mechanism for denying illogical thought. Minsky describes “suppressors” as agents that prohibit memes that do not fit in. Minsky is attributing an agency where there may not need to be one, but his point that there is a mechanism to deny illogical thought is useful. There must be some meta-rules of cognition that are based on the criterion of “understanding” or coherence of memes. Rather than imagine a

22 Kierkegaard would perhaps claim that all memes—because of their closed-ness and limitations—require a “leap of faith”. Our “understanding” is always prematurely closed and hence precarious. We are in greater existential peril to the degree that we presume we have escaped an unsophisticated type of faith without recognizing the continued limitation and fragility of our meme-world.
“decider” (like Minsky’s suppressor agent) who adjudicates meme interaction, we should imagine a few simple rules by which memes adjudicate themselves. These might be general rules such as that a memosystem be precise, parsimonious, and plausible. Other rules might hinge on logical consistency or non-contradiction with less reliance on empirical data. For example, a system like the faith memosystem can fit tightly together by being logically consistent and without necessarily being empirically plausible.

Thagard (1989) makes an attempt to model what he calls “explanatory coherence” on a computer based on 7 simple principles for relating two propositions. Given that the principles are simple enough to be simulated on a computer, they could describe meme interaction without presuming an external deciding agent. He describes explanatory coherence as follows:

We should accept propositions that are coherent with our other beliefs, reject propositions that are incoherent with our other beliefs, and be neutral toward propositions that are neither coherent nor incoherent. Acceptability has finer gradations than just acceptance, rejection, and neutrality, however: The greater the coherence of a proposition with other propositions, the greater its acceptability. (p. 436)

Rather than presuming that some memes have “great psychological appeal” (Dawkins, 1989, p. 193), we should look how some memes support other memes. There must be basic rules of meme interaction based on coherence. Taking “fitting together” or coherence as the underlying rule of all meme selection we can look at how this might occur at a group level.

**Selection and fitting together.**

Bateson describes “fitting together” with an example of a dog and a pet gibbon inventing and playing a game together. The two animals create a culture in a sense. The selection criterion is that their activities fit together into a coherent whole:

Patterns of interaction have been generated or discovered, and these patterns have, at least briefly, endured. In other words, there has been a natural selection of patterns of interaction. Certain patterns survived longer than others.

There has been an evolution of fitting together. With minimum change in dog or gibbon, the system dog-gibbon has become simpler—more internally integrated and consistent.
There is thus a larger entity, call it A plus B, and that larger entity, in play, is achieving a process for which I suggest that the correct name is practice. This is a learning process in which the system A plus B receives no new information from outside, only from within the system. The interaction makes information about parts of A available to parts of B and vice versa. There has been a change in boundaries. (Bateson, 1979, p. 138)

The two animals have created a structure of their interactions together. Allport might call it structurogenesis. The new boundary is around the two of them as a system. They each develop a recognition of the mutual pattern, and each looks for cues from the other to confirm that their interactions are coordinated into the pattern. This pattern is the context of their interaction and operates as a representation of the two of them together. In another of Bateson’s examples, a dolphin “corrects” Bateson when he does not perform as expected. The recent pattern actually informs the system of what the man should do next. Bateson deliberately broke the pattern of the dolphin’s expectations, but had he simply been in error, the system would have seemed to correct itself. There appears to be a pull for the system to cohere that is beyond any one of the participants. Those parts that do cohere “last longer than those which do not last so long” and in that way are selected.

Something along these lines must be the basis for the evolution of OC memes. The driving process is not reproduction, as in biology. We could assume that the selection criterion is something like coherence—like Bateson’s idea of fitting together. OC memes will “make sense” to the extent that they seem coherent with other phenomena experienced by an individual. Even the dolphin strives to make sense of Bateson’s “error” and correct it so that the whole system makes more sense.

To translate Bateson’s example more fully into the language that I have been using above, I could say that the dolphin and he each carried with them a (component)
representation of their interaction. This representation is of the larger system of their interaction, not just of themselves or the other. From the perspective of the system, it has a distributed self-representation. At some point the component representations held by the man and the dolphin diverged. The dolphin detected this—that the man was straying—and attempted to make sense by correcting him. It is possible that a clever dolphin might have tried to correct itself, as if to ask “what mistake have I made and what is my role in this process supposed to be now?” The dolphin would attempt to adjust its own representation of the interaction rather than make the man fit a previous representation. Some random variations by either participant might become incorporated into the structure as each experiences it fitting coherently with the whole. Subsequent behavior confirms the new meme between participants.

It is important to note that with OC memes, neither participant holds the culture unilaterally. The culture is distributed. Each carries a component representation that they attempt to have make sense. Interactions provide feedback from individual to individual about discrepancies that can be corrected by either one of them. Their mutual willingness to try to make the component representations coherent to themselves spawns the process by which the two component representations tend to converge. The converging population of representations form what I am calling the distributed self-representation, or the culture.

Coherence is really measured between individuals by being measured within them. By seeking internal coherence within an individual, the cultural level will tend toward cultural level coherence. Imagine two people—Stanley and Natasha—who are in an interaction like the dolphin-man pair above. They are each merely seeking to have their own component representation of the interaction make sense to them. Suppose that Natasha observes an unexpected behavior from Stanley. Stanley’s behavior affects Natasha because she takes Stanley’s behavior as an example of their shared interaction,
(culture). If Stanley’s behavior diverges from expectations, it is evidence to Natasha of a possible error in either Stanley or Natasha’s representation of the culture. Two OC memes from two individuals have come into conflict for Natasha, and the pressure is for her to resolve them. It is Natasha who first experiences the conflict as a conflict between her observation of Stanley’s behavior and her own representation of the group.

Natasha has several choices. One possibility is that she needs to reconsider the OC meme—Natasha can discover that she is wrong. Otherwise, if it appears that Stanley is indeed the one who is out of line, several things could be happening. Possibly Stanley simply made an error. He might be corrected or even punished. Alternatively, Stanley could be seen by Natasha as out of touch generally. “He never fit in here.” Stanley becomes an exception that proves the rule. The third possibility is a more extreme version of the second. Natasha might conclude that Stanley is not really a member of this group, “He isn’t really one of us.” This latter possibility is actually a change in Natasha’s representation of the group boundary. Stanley is the same but the boundaries around the group moved to exclude him.

So far this has all occurred within Natasha privately. However, her behavior is likely to signal back to Stanley that he has broached an expectation of the culture. His choices are similar to Natasha’s choices before. He can decide that he is wrong. He can even accept Natasha’s exclusion of him from the group. Or he can reassert his membership and his behavior by insisting that Natasha was the one who has deviated. In that case, he can treat her with the same options that she treated him: correct her or exclude her.

Stanley’s options can be thought of in terms of Piaget’s accommodation and assimilation. Stanley will either accommodate Natasha’s representation, admitting his error, or he can assimilate Natasha’s viewpoint by explaining away her deviance. He assimilates her behavior either by adjusting his representation of the group to fit hers or
changing his perception of her to fit with his representation of the group. Stanley’s internal process has the potential to change his component representation of the culture between them. Either Natasha or Stanley will likely change their representation of the group so that the two representations converge.

If Stanley and Natasha’s representations of the culture never interacted, there would be no adjustments needed or made and each could continue to have an internally coherent representation of the culture, not knowing that they differed. Once they do interact, the conflict is experienced internally first. Processing of differences occurs first in the (distributed) hardware of individual brains. Then, its effect is that the population of representations tends to converge.

If the level issue is confusing again, that may be because the two levels are complexly intertwined. The reifications described in Chapter I threaten to resurface. Individuals do not set out to make the cultural level occur. However, their actions are at the same time both individual and cultural. It may be helpful to think of the two levels abstractly as two levels in which a cybernetic feedback loop is closed, as described briefly at the end of Chapter I. A loop closes when feedback reaches back to the beginning of the next cycle of the loop. When an individual reaches a conclusion about how to make their representation of the group level cohere, we might say that the individual loop has closed. This loop must close before there is pressure for the larger loop between individuals (at a cultural level) to close. The larger loop is entirely dependent on the smaller loop. At the same time, the larger loop makes the smaller loop possible by historically providing all of the meme process of which the smaller loop is composed. The larger loop emerges with supervenient control over the smaller ones.

There are other complexities that begin to enter the process. These can obscure the dynamics of the stochastic process, but do not invalidate it. For example, this model has not taken into account differential power relationships. Some persons will be quite a
bit more influential than others in defining the group and persuading others. Other individuals—leaders of one sort or another—will be perceived as the embodiment of the culture and their behaviors will be particularly salient in how others represent the group. Issues of the legitimacy of different people’s views will also play an important role. These all complicate determining the influence of coherence. In a broader sense, these complexities are part of a social context that also has to be coherent. Another higher emergent level of supervenient control is operating with its own requirements for coherence. These considerations do complicate describing any simple model of coherence based on the selection of OC memes by themselves, but the principles remain valid.

Also, it is important to note that a coherent representation of the culture does not at all imply that the culture needs to be homogeneous. In fact it may be part of the representation that “everything goes,” conflict is cherished, and so forth. The power of the culture is that there is widely perceived agreement on a broader level that difference is respected. Sometimes the only level of coherence that can be reached is an agreement to disagree, but to whatever extent this agreement exists, that is what is shared.

In addition to heterogeneous cultures, there can also be cultures built around a specific strong conflict. A strong conflict in no way implies a weak culture. Smith and Berg (1987) have noted the powerful binding effects of dichotomization in small groups. Wells (1985) notes groups’ forceful agreement on highly differentiated roles—what he calls “canalization”. Polarization of the group can reinforce the cohesion of its self-representation. If we want to say that coherence is the selection criterion, it needs to be in a more inclusive sense than usual. There is something very coherent about a bitter dispute. You can take either side, but a neutral or irrelevant stance does not easily endure.

It is perhaps ironic that individuals try to reach agreement because of the presumption of a singular group. By this process, they create the group. Though there are
many ways to start up a group, a group can come into being sometimes simply because it is perceived as a group. This is the finding behind Social Identity Theory (Hogg & Abrams, 1990). Individuals placed into a nominal (minimal) group are compelled to start reifying the group. According to the theory, they will eventually come to promote the group against other groups. For whatever reason, it seems to come easily to us to form groups and ascribe group level qualities to them. When we do individually try to make sense, that process leads to the creation of a functional essence of a group. The belief in the essence of the group—its reification—motivates a convergence of opinion which becomes the functional essence.

Daft and Weick (1984) describe the way that individuals’ efforts to make sense ultimately constitute the organizational level sensemaking:

Organization theorists realize that organizations do not have mechanisms separate from individuals to set goals, process information, or perceive the environment. People do these things. Yet in this paper it is assumed that the organizational interpretation process is something more that what occurs by individuals. …A piece of data, a perception, a cognitive map is shared among managers who constitute the interpretation system. Passing a startling observation among members, or discussing a puzzling development, enables managers to converge on an approximate interpretation. …Reaching convergence among members characterizes the act of organizing … and enables the organization to interpret as a system. (p. 285)

This describes how representations become “shared.” Representations are never truly shared perhaps. Each individual has a personal version. The sharing is a result of attempting to reach congruence so that each representation will make sense to its bearer in the context of others’. A corollary of this view of sharing is that there is never an “essential” version. Each individual’s version is a part of the shared (distributed) representation. This is important because each individual’s version carries the weight of the whole. Though individuals have differential credibility, information from an individual will not necessarily be discredited because it is “just one individual’s view.” When Natasha sees how Stanley behaves, this is *prima facie* evidence of the culture. Members of a group have *no other* route to discover the culture than each other.
“One pass” learning.

Gould (1991) claims that culture evolves in a Lamarkian manner. By this he means that your idea (meme) on a subject can in one pass change my idea on the same topic. You tell me something and I learn it. Indeed our everyday conception of transferring ideas seems to support this. I will show below how this contrasts with the stochastic model.

There are problems with this Lamarkian notion. When you communicated an idea to me, I would be required to decide whether the new idea made sense. Then if it did, I would come to hold the idea myself. But this takes us back to the idea of my “deciding” which memes I will hold and which I will reject. It is to be hoped that the stochastic principle can allow us to model a process where we do not need to infer a mysterious decider.

Another approach to the Lamarkian theory might be to suggest that a meme changes itself. If we define a meme as a process, then we could easily say that a process changed. As the changed meme persists, it hands off its new form to other memes in an “inheritance of acquired characteristics.” However, this model merely pushes the “decision” issue to inside the meme. How does a meme decide whether to change or not? How do memes innovate?

It is more helpful to say that a meme was replaced on a criterion of coherence than to say that it was “decided upon” or that it “decided to change itself.” In contrast to these Lamarkian notions, I am assuming that these “decisions” are in turn a stochastic process where “making sense” is a matter of coherence with a population of memes that are already held.
Criteria for Emergence Revisited

It should be easier now to see how the DSR model of organizational culture and organizational learning meets the three criteria of emergence laid out in Chapter II. OC memes are about processes and not substances. Their interaction is circular and iterative. The stochastic process uses part-for-whole coding to connect the levels of component representations and the population of these held as an organizational culture.

We can also see how the organization learns—at the organizational level. The emergent process allows the organizational culture to move with the continuous flux of OC memes held by all of those individuals making a representation of the organization to themselves. We can now look at a specific case of organizational learning and apply the DSR model.
Chapter IV: Case

It will be helpful to see how this model can be applied in an organizational setting. A full development of Cook and Yanow’s (1993) case in light of the DSR model will ground the DSR model in familiar concepts of organizational culture and learning. Cook and Yanow have developed an excellent illustration of organizational learning that compels seeing it as a group level phenomenon. They base their model on organizational culture as the medium of organizational learning. They differentiate this “cultural perspective” from a “cognitive perspective” to organizational learning. I will describe the cognitive perspective to organizational learning and then how Cook and Yanow’s cultural perspective and case study support the DSR model presented here.

Cognitive vs. Cultural

The cognitive perspective Cook and Yanow (1993) describe has two approaches. The first cognitive approach to organizational learning is about individual learning in the context of organizations. An example might be some of the work by Senge (1990). Senge’s work on organizational learning and systems thinking places a lot of emphasis on organizational level phenomena. However, much of the practical advice in his five disciplines addresses the individual level. For example, personal mastery focuses on the development of the individual. Mental models—though shared and having their effect on the organization—are largely conceptualized in terms of the individuals who hold them. Senge’s (1990) work shows the importance of individuals seeing the whole system and Senge stands out by addressing the importance of the organizational level. Despite this, he does not have a model for understanding how the system itself learns. He does not have a dynamic explanation of organizational learning at the organizational level. Without such a model, it is too easy to drift from looking at individual learning as a part
of organizational level learning to merely looking at individual learning that benefits the organization.

Cook and Yanow review a number of other cognitive models that attempt to describe an organizational level phenomenon while consistently reverting to the individual level of analysis:

Some authors state that they take organizational learning to be different in some sense from individual learning. …Nonetheless, the accounts and illustrations offered by these authors typically describe episodes of individual learning that occur within organizational contexts (p. 375).

The gist behind organizational learning from this perspective appears to center on improving the effectiveness of organizations by helping individuals learn better. In turn, adjusting organizational variables enhances learning by individuals. This is similar to what Lave (1991) calls a “cognition plus” view, where “social factors become conditions whose effects on individual cognition are then explored.” (p. 66). This sort of “cognition plus” does have effects on the organizational level. However, the cognitive process itself is still conceptualized as an individual level phenomenon.

The second cognitive approach to organizational learning describes organizational learning as a cognitive analog to individual learning. Here the organization is likened to a thinking individual. Individual learning becomes a metaphor for how we can understand organizational learning, as if organizations were individuals. Morgan (1986) reviews this approach in a chapter on “organizations as brains”. Learning is now conceptualized at the organizational level, but within the metaphorical constraints of the analogy with individual cognition. The danger is in forgetting the limitations of the metaphor and exaggerating its relevance.
Cook and Yanow find “three substantive problems” with this second approach to the cognitive perspective. First is the “ontological status”\(^{24}\) given organizations as “cognitive entities”. I would want to replace the word “entity” with “process”. We have already seen that reifying any cognitive process will lead to confusion. Then, to call an organization a cognitive process would require expanding the concept of “cognitive” beyond recognition. If we called the organization a “learning process” we would be back on track. The word that I want to use is “mind” from Bateson’s work described above. This term also carries the danger of inviting too strict a correlation with our concepts of individual cognition. However, it is much broader than cognition and helps mitigate the second and third problems associated with the cognitive approach.

The second problem described by Cook and Yanow is the paucity of understanding of individual cognition that might then be fruitfully applied to organizations. A largely unsolved puzzle is a poor candidate as a metaphor for another puzzle. Ultimately, I believe that work on individual cognition will continue to be an important source of analogies for organizations, but it is too early to be definitive. Specifically, the DSR model owes some of its form to research on individual cognition, but it would be wildly speculative to go much past the sparse analogies offered here. As a third problem with the organization as brain perspective—even without the first two problems—it would be difficult to conclude when or whether “brain-like” learning ever occurred in an organization. In my own terms, we would need a dynamic explanation of organizational learning. Without this, we are attributing learning to the organizational level merely as a superficial analogy with individual learning. This restraint is prudent given the second problem described, but it does not give a strong basis for a theory.

\(^{24}\) What constitutes a cognitive entity is very vague. I think that the difficulty is in whether we want to ascribe an entity status to organizations in the folk notion way that we make this ascription to individuals. Rather than ascribe entity status to organizations, I would suggest that the way out of this dilemma is to be more circumspect about attributing an ontological status as a “cognitive entity” even to individuals.
In transcending both “cognitive perspective” approaches, Cook and Yanow strive for a third “cultural” perspective:

…where learning is understood to be done by the organization as a whole, not by individuals in it, and where the organization is not understood as if it were an individual (that is, as if it were in some way ontologically a cognitive entity). (p. 374)

By describing organizational culture as a medium of learning, their argument moves beyond a grounding in the cognition of individuals or a grounding in individual cognition as a metaphor for organizational cognition. Organizational culture itself learns at the organizational level. The DSR model provides a specific mechanism to support that claim. First, I want to outline the case they use to illustrate organizational learning.

The Flute Workshops

Cook and Yanow study three flutemaking shops. Each is a small shop using mostly hand methods. A flute passes from one work station to the next as each craftsperson adds their part to the completed flute. No flutemaker is expected to know how to do all of the parts of flutemaking, but rather each becomes expert in the one part for which they are responsible. Despite flutemakers each knowing only parts of the process, and despite the coming and going of flutemakers over time, the shop maintains the ability to make a flute with remarkable consistency. The organizational level of the shop can be said to know how to make a flute.

This consistency is a function of the interactions of flutemakers. Naturally, each flutemaker is very dependent on the processes before and after their own in the overall process. When they finish a piece they hand it off to the next work station. But the acceptance of the flute is not at all automatic. The two craftspersons will discuss in what ways the flute is right and how it might need changing. There is a negotiation of how the flute will be made. They do not generally make recourse to written specifications or gauges to evaluate the flute. Rather, each takes what from the outside would appear to be an intuitive approach to figuring out how the flute needs adjustment. It is indeed not
merely intuitive but is based on a highly developed tacit knowledge of how the flute should perform.

Translating this case into the language of the DSR model we can see flutemaking knowledge as a distributed self-representation. The self-representation in this case is specifically on the dimensions relevant to making a flute. The shop no doubt has dimensions of the self-representation relevant to accounts receivable, hiring practices, when to open a window for fresh air and myriad other procedures. Organizational culture will extend far beyond the central task of making flutes. However, this sense of what their particular flute is like, how it performs, how it looks and so forth is very critical to the identity of the shop. It is the OC meme for a “good flute.” The OC memes for maintaining the flutes within this normative representation are a distributed population. Nowhere is all of the information collected and written down in one place. Actually it could not be since much of it is implicit. It is also highly redundant. Constant exchanges make sure that many different craftspersons have many parts of the overall picture of how to make a flute.

Aside from being distributed, much of the self-representation is actually embedded in specific flutes. The only way to teach a flutemaker what kind of flute she should be making is to show her a flute—actually lots and lots of flutes. Cook and Yanow call this “artifactual interaction”, where there is a constant referring to examples of specific flutes and their qualities. The organizational culture is not entirely in individuals’ heads, but rather much is materially embodied in artifacts, e.g., flutes, (and in the interaction of individuals). This is particularly true in the flutemaker’s shop because the principle mode of communication about flutes is over specific flutes themselves. This illustrates an interesting aspect about the mode of learning accomplished by a culture. It is not such a logical process as one might expect.
Logic vs. Pattern Recognition

Margolis (1987) elaborates a distinction between two perspectives on cognition in individuals. Most typically, theorists have considered cognition in terms of “algorithmic” thinking. In other words, cognition follows a set of logical rules from given premises to a logical conclusion. Some of our cognition is undoubtedly very logical in this way and runs step by step, i.e., algorithmically. When we approach organizations we sometimes hope to have them run by this ideal as well. Simon (1955) described “bounded rationality” and “satisficing” mechanisms which describe both cognition and organizations as being somewhat less “logical” than previously imagined. Margolis pushes this point to claim that people typically make judgments such that they could never explain the logical process behind them. In fact, judgment is not generally a logical process. Margolis suggests another model for how we think about cognition.

He distinguishes from algorithmic logic another basic type of information processing: pattern recognition or what he calls “p-cognition”. This dichotomy between logical algorithms and pattern recognition resembles one in AI between serial and parallel processing. There are in fact so many versions of this dichotomy that Minsky (1991) gives this elaborate title to a paper on the topic: “Logical versus analogical or symbolic versus connectionist or neat versus scruffy.” The dichotomy boils down to recognizing a kind of cognition that is quite unlike our logical ideal. Margolis contends that when we are logical it is actually a special case of the broader p-cognition that we use in everyday cognition.

My suggestion is that p-cognition best models organizational learning. The judgment processes are tacit. They are based on “exemplars” (Kuhn, 1974) rather than

\[25\] I suspect that our over-estimation of the degree to which our cognition is based on logic dates back at least as far as Plato. The experiments that Margolis (1987) describes dramatically point out the vanity of this presumption. 
logical criteria. This seems to be very much the case for how learning and judgment occur in the flutemaking shops. There are no rules (algorithms) for how to make a flute because nobody knows how to make a flute by rules. That is not how flutes are made—at least in these shops. Flutes are made by a process of judgments based on patterns and tacit knowledge. This model of cognition presents a more plausible description of organizational learning than the presumption that organizations think or learn in a logical way. It is also consistent with cognition by judging “fit” and coherence. Logic suggests an application of a set of decision rules to reach a conclusion. Rather than this linear logical process, pattern matching could more accurately describe the assessment of fit in organizations and the individual. When a specific flute matches a pattern of exemplars, it is coherent with a representation of a good flute. The lack of match suggests that something is wrong with the flute.

Kuhn (1974) underscores this same point in describing paradigms or “disciplinary matrices”. Part of the knowledge that a scientific community contains is based on exemplars. Thinking inside a paradigm is not usually a matter of applying a set of “correspondence rules” that belongs to that scientific community. It is much more likely to be recognition of a pattern—one built up of many exemplars of the same theme. This fit between the current scientific question and the experience and generalization of past exemplars is how normal scientific thinking proceeds. On the scale of an organization, the exemplars of “flutes that feel right” provide the methodology for judgment about the “feeling right” of a specific flute. This artifactual interaction is the fundamental basis of judgment rather than explicit tolerances and measurements of flutes. By fitting the present flute with the past exemplars, the flute is replicated.

26 Cook and Yanow comment that indeed some Japanese firms are trying to make flutes with a “large-scale, highly tooled” process. One imagines a much greater dependence on explicit procedures and statistical measurements where making a flute “by the rules” might be possible.
Fidelity and Learning

So far, this pattern recognition model of judgment appears to describe a system trying not to change. It seems that the flutemakers are not trying to learn, but rather to maintain what has gone before. Indeed, if learning is defined as change, then organizations seem rarely to try to learn. They are instead trying to maintain a coherent identity—as Cook and Yanow describe in the flute workshops. They are replicating the flutes that have gone before. Change is most often tripped upon rather than sought out.

This is a paradox: A learning system often accomplishes learning when its parts are trying to maintain stability. This is not unique to this particular example of the flutemakers. Dawkins (1989) puzzles over the case of biological evolution. Replicators in any stochastic system face the same dilemma as OC memes in an organization. Do they try to replicate perfectly, and if they do, from where does innovation come? If they are trying to stay the same, how can they learn as a population? Dawkins describes the contradiction this way:

Can we reconcile the idea that copying errors are an essential prerequisite for evolution to occur, with the statement that natural selection favours high copying-fidelity. (1989, p. 17)

A specific genotype is really successful only when it reproduces itself accurately. If it distorts itself, it replicates something else and it dies off. From the perspective of the specific genotype, an error means death. However, from the population’s perspective these errors are the only opportunity for a population of replicators to learn. The two parts of this dilemma seem contradictory unless the two processes are occurring on different levels. Genotypes tend toward remaining the same. Evolution rewards them for doing so. However, the population tends toward learning, which means constantly experimenting with new configurations and eliminating those that fit in less well. Neither of these processes is of course actually striving toward anything. They are not teleological, but the tendencies they promote are in contradiction. Learning occurs because selection happens
at the population level. Despite a genotype striving for fidelity in copying, when there is an error, the population level can harvest a learning.

This is also true in flute workshops and in organizational culture generally. The idea of coherency seems to preclude trying new things. Novelty is not likely to fit in. However, novelty is essential for the organizational culture to learn and change. The case of the Powell flute workshop in Cook and Yanow’s essay illustrates this. An innovation—a new scale—was introduced, not by the Powell workshop, but by a person named Cooper. Powell was indeed trying to make the same kind of flute it had been making for years. The Powell identity relied on being able to consistently reproduce this same feat, over and over. But the introduction of the Cooper scale posed a problem for Powell. Their self-representation described them as making the “finest flutes in the world.” On the other hand, the Cooper scale presented itself as a possible improvement on flute design. Would they change their representation of “the finest flute in the world,” by recognizing the superiority of the Cooper scale? Would they change their self-representation of what kind of flute they made, that is, the second finest, but the same as before? The process is like the Piagetian accommodation and assimilation described earlier. Powell had to choose between believing that the Cooper scale was not an improvement and that their current flute was still the world’s finest flute (assimilation). Or they could change what they did, to maintain their identity as making the finest flute, but making a substantially different flute (accommodation). Or they could change their identity by making the second finest flute (another accommodation). Ultimately Powell adopted the innovation. To adopt the Cooper scale was indeed a loss of their ability to maintain what had gone before. It was essentially a defeat \(^{27}\) for the flute that had made them famous. But, by the changing of their self-representation, the flute workshop

\(^{27}\) Cook and Yanow report that Powell continued to make their old flute, but in significantly smaller numbers.
“learned” how to do the world’s finest Cooper scale flute. An older flute died and a workshop learned.

**Levels Again**

This distinction between what happens on the level of an individual OC meme and what happens for the population should sound familiar by now. OC memes do not learn. They just try to replicate. They replicate by fitting in coherently with a larger system of OC memes. Organizational learning is a group level phenomenon by which some OC memes no longer fit. The system of “Powell’s identity = the Powell scale = the finest flute” could no longer cohere. The element of the Powell scale gave way. The OC meme of making a Powell scale flute no longer fit with the larger system. But now a stronger system emerges of “Powell’s identity = the Cooper scale = the finest flute.”

The replication of the Powell scale meme suffered in order for the best fit with Powell’s self-representation as making the finest flutes. This could not happen without a diversity of possibilities. Before Cooper designed his scale, it could not present itself as a possibility. The diversity of OC memes created by Cooper’s scale introduced the potential for learning. This is so even though this diversity constantly threatens schisms in the identity of the organization. Through a constant death of particular OC memes, the system or population of OC memes learns.

Here is a great advantage of such a system of OC memes. I said earlier that an individual could never make a flute all alone—that it is an organizational level task. This last discussion illustrates an important way in which this is true. Imagine that a hypothetical flutemaker learned all of the steps to make a flute. He was as proficient at each task as each of the flute makers in a regular shop would be. He still could not do the same thing that the workshop does as a whole. He could certainly make a good flute at the start, but he might not learn. When he made errors, there would not be that artifactual
interaction that happens in a regular shop to check these. There might be improvements or not, but the ability to maintain consistency would be greatly diminished. As an individual he could learn. He might adopt the Cooper scale just as a single flutemaker. But the breadth of learning that an organization can accomplish will far outstretch this individual. Despite the prodigious talents of this hypothetical flutemaker, he would be at even more of a disadvantage in an organization larger and more complex than the fluteshop. There would be no way to match his judgments against those of other flutemakers to achieve the kind of self-correction that the shop as a whole achieves. He might make a fine flute, but he would not have the stability nor the learning capacity that a workshop as a whole has.

**Clades and Identity**

Part of the power of an organizational culture—a DSR—is that it reflects the identity of the organization. That identity provides the context for OC memes, as I discussed above. One consequence is that a new workshop can diverge from the organizational culture of its parent workshop. The Powell workshop is actually the second in a string of three workshops. Powell split off from Haynes and in turn Brannen Brothers spun off from Powell. Although all three share a common ancestry with Haynes, each has developed a unique style of flute and a unique identity. This parallels the process of speciation in biology. In biology, a subgroup of a population becomes isolated. After evolving a certain amount, it is no longer able to reproduce with the original population, even if no longer isolated. Both have changed in the interim time. In the flute shops, as soon as the identity of a new shop is created it is no longer involved in the evolution of OC memes flutes in the parent shop. The offspring workshop can begin to

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28 Remember that learning requires a population of memes, and an individual could have a population of different memes about flutes. In that sense he can learn. But to learn at the organizational level would require distribution of memes beyond one person. It is still important to distinguish a population of memes (which can learn) from a population of people (which constitute an organization).
evolve its own fit of what makes a good flute. The parent shop can also continue to evolve. In biology, after a certain time, genetic changes make interbreeding impossible. For the flute workshops, the difference in identity instantly separates their OC meme populations.

In this way, the flutemakers’ products reflect a “cladistic” differentiation from the other flutemakers. An isolated biological subspecies develops a new clade, and so does a newly identified shop. Though all three flutemakers in the example developed from the same original shop, each differentiated a unique style. In other words, the identity and integrity of the enterprise enforced an internal criterion of coherence that did not exist between enterprises. The context of “how we make flutes” is critical, not just “how flutes are made.”

It is to be hoped that this case provides some grounding of the DSR model in the actual processes of an organization. Cook and Yanow’s case provides an excellent vehicle for seeing the process of organizational learning mediated by organizational culture. Hopefully the DSR model enlarges on their model. By offering a dynamic explanation, the DSR model may add an important complementary part to their discussion.
Chapter V: Implications

I have clarified what the group level is and how it should be conceptualized in terms of process emergence. I have described a dynamic explanation connecting the individual and group levels. This has not been developed before and should bear fruit in new theorizing. For example, I will discuss below how leadership should be considered as a group level phenomenon. I have also laid groundwork for more solid investigation of the processes of organizational culture change and organizational learning. Below are some implications of this work in more detail.

An Emergent Group Level

The DSR model gives us a way to study organizational culture where we really look at the group level, rather than aggregates of individuals. We now have a description of how process emergence might work. This has practical implications for our conceptual work. The relationship between the level of the organization and the individual has been a perennial issue. The issue of what I call process emergence is central to discussions in many other fields as well. By highlighting “process emergence” as against parts (matter) synergy or the magical synergy of energy, I have moved the discussion forward so that some new resolutions are possible. With a description of how synergy or process emergence might happen, we may be able to facilitate or resolve the discussions of whether or not process emergence occurs in the first place. The DSR model also clarifies the relationship between the individual and group levels, allowing for more productive debate about the relationship of individuals to the organizations they inhabit.

Homogeneity of Culture

One implication of understanding the group level as a DSR is that it clarifies issues about the homogeneity or heterogeneity of cultures. These issues really arise out of
the level confusions tentatively resolved above. Organizational culture, like other types of
culture, is both completely distributed amongst individuals, at the same time that it is
defined and only makes sense in terms of coherence or “sharing” between individuals.
Being both an individual and a group level phenomenon leads to difficulties in trying to
describe organizational culture as either homogeneous or heterogeneous.

The DSR model is particularly helpful in resolving the three paradigms of
culture—“integration”, “differentiation” and “ambiguity”—described by Meyerson and
Martin (1987). Though they advocate serially adopting all three perspectives as a way of
integrating them, the DSR shows why all three are legitimate descriptions of
organizational culture within the same framework. The concept of a population of OC
memes allows for all three paradigms under a single paradigmatic (theoretical) roof,
rather than as a multi-perspectival tent.

The integration paradigm views organizational culture as an integrating
mechanism built on consensus. This paradigm is in line with the notion in the DSR model
that component representations converge. The integration paradigm is probably the most
common approach to organizational culture. However, the differentiation paradigm
suggests that cultures are often composed of many subcultures and possibly even what
could be called “subcultures of single individuals”. Within any organizational culture, the
identification of subgroupings is highly likely and each in turn becomes the object of
representations. A new subculture is born whenever there are two or more interacting
component representations of a subgrouping. Depending on the degree of detail one
wanted to pursue, there could be nearly endless subcultures within a larger organizational
culture. This is possible in part because subcultures are defined by the boundary of a
group, not by the characteristics of the individuals who make up the group. In other
words, individuals can be partially included in the main culture as well as many
subcultures. Which subcultures a person belongs to is not a characteristic of the person
but is a characteristic of the subcultures and their boundaries. If individuals can represent themselves and others as being in cultures and subcultures at the same time, the DSR model becomes consistent with the differentiation paradigm.

Finally, the ambiguity paradigm suggests that cultural effects are usually unclear or ambiguous. This follows naturally from the DSR model in that the culture is always distributed. Different actors are making different meanings at different times. Though there is pressure towards convergence—which makes culture possible—there is also much deviation and difference. It is impossible to say precisely what the culture is at a given moment in a given place. Though the individuals’ beliefs in the integrity of the group imply an essence of the culture, there is no such essence. It is not just that it is difficult to discern the essence of an organizational culture; this essence does not exist. The organizational culture remains a process of interaction of disparate OC memes. From this perspective, it is necessary to recognize that organizational culture is fundamentally ambiguous.

The DSR model incorporates the three different perspectives on organizational culture as three different manifestations and ways of looking at the underlying dynamic. Having such a model will help us to know when we may want to use one lens or the other to look at particular organizational cultures. Unlike the Meyerson and Martin model, however, there is a connection of the three perspectives under one dynamic explanation.

**Individual and Group Autonomy**

How can culture (with a “mind” of its own) and individuals with autonomous conscious purpose interact? Does the idea of an autonomous culture obviate the need to explain individuals’ actions as autonomous? Not only can individuals disagree with a culture, but its distributed (population) character makes it hard to say whether they are agreeing or not. If an actor agrees with some people and not others it remains ambiguous
as to who is in conformance with the culture. And yet at the same time, their behaviors still contribute to the culture as soon as they are perceived by others.

This begins to address questions about how to account for individuals’ autonomous actions. Though recognizing cultural phenomena in organizations, Golden (1992) protests that the organizational culture perspective neglects individual autonomy. Even in highly normative contexts, she claims, individual autonomy contradicts the hegemony of culture. The underlying assumption of these arguments seems to be that autonomy can belong to the group or to the individual only as a zero-sum quantity. According to this view, the more influence that culture has, the less autonomy individuals have.

However, it may be that individual freedom is not inversely related to the autonomy of organizational culture. Individuals have to be the substrate from which culture emerges. But stronger individuals do not mitigate a strong culture. As Golden illustrates, individuality can be highly expressed even in a highly normative culture. Though Golden does not say this, the deviance from an organizational culture may actually reinforce it rather than undermine it. As the expression goes, “A rule is most recognized in the breach.” Despite severe infractions, the culture as a representation of what one should do is not necessarily diminished. Rather than see individuality and organizational culture opposed, I view organizational culture as more related to patterns of mutual communication and influence. Influence and individuality can both be high as Golden’s case study seems to illustrate.

The way that we can understand the autonomy of the group level and the individual as not in opposition is to remember that they are each a level of emergence or learning. Each is its own level of cybernetic feedback. Though each level controls itself, they do not need to do so at the loss of control of the other. A behavior that an individual enacts can be both an autonomous individual act and an act on behalf of the culture at the
same time. These are not mutually exclusive. To suggest that the culture influenced the act does not mean that the individual does not take responsibility for it and even experience it as entirely independent of the cultural level. Conversely, the fact that individuals exercise their autonomy and act as they please does not mean that culture is not having its effect.

**Control and Double-Loop Learning**

The whole question of who has control in an organizational culture is an interesting one. The fact that there is autonomy at both the individual and group levels suggests that both levels have control. What then are consultants to do when asked to change organizational cultures? How does a consultant help change a culture that has a “mind of its own”?

If a culture is a learning system, then learning about the learning system constitutes taking control of that system. If we understand it we can change it. Argyris and Schön’s (1978) notion of double-loop learning falls into this line of thinking. An effort is made to understand the assumptions underlying organizational action. The awareness of these assumptions is generally at the individual level. Individual managers analyze their process and assumptions and when they gain insight, they attempt to change themselves and the organization. The double-loop adds a new level of control, a new feedback loop. The organizational culture has its own first level feedback systems. Then the manager as an individual reflects on their own and the organization’s behavior to affect a second order change.

However, the organization may be engaged in second order “double-loop” learning already. In terms of the DSR model, the organization is trying to find a stable configuration of OC memes that will all fit together. When managers or anyone else begins to change their component representations of the organization, then the
organization continues to try to learn what to do with that. The organization will hopefully change in response to the manager who is trying to affect the culture. However, the organization may make sense of that manager in a way that was not anticipated. Perhaps it becomes a culture that regards its managers as out of touch and meddlesome. This will doubtless affect the efficacy of the manager’s efforts. So who is controlling who? Who is doing the double-loop learning? Nobody can get the last word in this interplay.

This calls for a slight revision of the idea of double-loop learning and Bateson’s conception of learning in terms of a hierarchy of logical types. Though Bateson never claimed this, the idea of a hierarchy of levels of learning suggests that one level builds on the next in a progressive fashion. However, we can see from the example above that different subsystems may be learning about each other in a multi-directional interaction. The image of levels neatly building one upon the other is oversimplified. Multiple subsystems are learning about each other, and about the systems that learn about these subsystems as a class. There is no Hegelian progression to the highest hierarchical level of learning where absolute knowledge is ultimately obtained. Here the biological analogy is again instructive.

Imagine Bateson’s description of biological evolution as learning is true. The ecosystem as a whole is learning how to best fit all of its parts together. It is doing this by each species learning how to best fit in to the environment. Along comes an all too clever animal (a human) who decides to learn about its ecosystem. It not only adapts its intelligence biologically, but it applies that intelligence to greater exploitation of the ecosystem. At a certain point the humans recognize the folly of destroying their own environment and even have the hubris to try to remedy their own destruction. Perhaps they set out to protect or even recreate specific habitats for other species. All the while, the ecosystem is continuing to adapt itself to the harsh influence of this particularly
virulent species. Other species are busily learning about humans to better adapt to them as an environment. Raccoons figure out how to open my trash can. Even more clever microorganisms discover how to survive the latest antibiotics developed by humans. The list of new symbiotic relationships is nearly endless. Where is the top level of control in biology? There is none. Ogilvy (1977) makes the same point about the relationship between the individual and social levels:

[S]ocieties are “in” selves as much as selves are “in” societies. The grammar of inclusion for the structure of subjectivity does not follow the logic of inclusion for Euclidean space where larger boxes will not fit in smaller boxes. The structure of subjectivity is not an architecture of boxes; rather it is an order of mediations, a “circular” order in the sense that the series of successive mediations bends back upon itself so that the “smallest” parts of the self mediate among the projections of the “largest” collectivities. (p. 90)

There is not a sense in which the levels stack up toward a “top” or get progressively included into the “largest” container. In any situation of learning, there is no final learning that is about all of the other levels of learning. There is no last word.

The reflection-in-action (Schön, 1983) approach to learning has its appeal. Learning still outperforms a strategy of not learning. Reflection is often a critical skill. The drawback comes if it convinces us that we can rise to the top of the learning hierarchy. Our grasping for that absolute knowledge can trap us in smug self-assurance about our ability to understand. An antidote to this tragic overconfidence is the perspective of Kelly (1994), who advocates recognition of how much is “out of control.” Recognizing the out of control nature of such systems is preferable to making ever more heroic efforts to get everything under control. This also seems a prudent path in trying to manage organizations.

**Leadership as a Group Level Phenomenon**

If leaders are not controlling organizations, what do they do? A proper perspective on this requires viewing leadership as a group level phenomenon, not simply an individual level one. A leader has significance as a shared symbol in a culture. Most
(perhaps all) groups have a “leader meme” that powerfully affects the group. Part of a DSR for a group is the distributed population of OC memes about the leader. How members of a group perceive their leader is deeply entwined with how members perceive the group itself.

This is different from saying that the leader is a powerful person influencing individual members of the group. Schein’s (1985) model relies on this personal notion of a leader “imposing themselves on their organizations” (p. 216). In contrast, the DSR model allows us to see leadership as mediated by the DSR of the culture. Individuals carrying component representations alter them based upon observations of the leader. This then shifts the population of representations, the DSR. Leadership should be seen more as modeling and illustrating rather than direct behavior reinforcement by the leader. In this way, a leader can be conceptualized as a creation of an organizational culture, as much as its creator.

A leader is also always contextualized to a group. A leader’s importance is in shaping representations of the organization, not just attitudes in general. Because of this, there is an intimate connection between leadership and vision. Both are a function of the DSR. Vision should not be seen as a general set of values but as values that belong to a specific group and culture, just as a leader does. Perhaps vision and leadership are different sides of the same coin. Bion suggests something like this:

The leader need not be identified with any individual in the group; it need not be a person at all but may be identified with an idea or an inanimate object. (Bion, 1961, p. 155)

A leader always belongs to a group—to followers. Leadership and vision are ultimately based in the DSR, and as such are carried by followers. This suggests that more research effort should be spent on the importance of “followership”. We need to look not just at what the leader does, but at what it means to followers. We might thereby gain a better understanding of both the power and impotence of leaders to influence organizational culture.
Organizational Learning and Change

Two important areas of implications arise with respect to organizational change and learning. The first is that interventions can now be better conceived of as interventions at the organizational level. In particular, the recent interest in large group interventions (LGIs) and “future search” (Weisbord, 1988) methodologies points toward the need to change whole systems in real time. The DSR model hints at some reasons why that might work and how to improve the approach. The target of intervention is no longer at the level of individuals’ attitudes but individuals’ representations of the whole system. Without the whole system in the room to “demonstrate” changing itself, this kind of change of representations is much more difficult.

Another important area arises from a direct analogy to biological evolution. Early models in biology emphasized that evolution occurred gradually with incremental changes. New perspectives suggest that evolution should be considered a punctuated equilibrium (Gould & Eldredge, 1993). There are long periods of stability punctuated by rather dramatic change and then a return to stability. I will develop each of these areas of implications in turn.

Intervention at the Organizational Level

With a new perspective on the dynamics of organizational culture, we achieve new perspective on how we might intervene at the group level. There are implications for how organizational culture change must come about. Most intervention strategies are based on the idea of changing individuals within organizations. Yet I am contending that organizational culture is another emergent level with its own autonomy. Because of this, the target of intervention should be that emergent level itself. Efforts to change organizational culture have to be aimed at the dynamic nexus of the DSR.
There is one type of intervention that has made significant practical inroads in how to do this. LGIs (see Bunker & Alban, 1992) bring all of the stakeholders of an organization to a single place to change the culture together. This strategy may owe some of its effectiveness to the fact that it works on the group level directly. To change an organizational culture, an intervention needs to change the population of representations of the organization held by its members and others. Changing values and assumptions of individuals out of context will be difficult and perhaps futile. However, changing the perception individuals have of the values and assumptions expected of them in that particular context will have high leverage. Although this change could conceivably be done on an individual basis, there is no more credible way to change perceptions than to have people watch the change occur in real time.

A LGI allows each member or stakeholder in an organization to watch new OC memes being tried out instantly. The sense of coherence is immediately evident when each individual watches perhaps hundreds of others also endorse a new OC meme. The same person sent to a training to instill the new cultural values would have much less sense of whether the new OC meme fit or not. More than likely she would be cynical that there is a disconnection between “espoused culture” and “culture in action”, (to paraphrase Argyris).

The LGI seems to be a promising approach to organizational culture change. The DSR model may give theoretical support for this already popular strategy. The DSR model focuses attention on the fact that organizational culture is contextualized and that the context of individuals’ values, assumptions and behaviors is what has to change, not the individuals per se. The DSR model implies the shift in the locus of responsibility for organizational culture. Whereas it is often considered management’s responsibility to manage organizational culture, the DSR model suggests that responsibility for change is a collective one, not just of leaders and consultants.
Configurationist Approaches and Punctuated Equilibria

There is a significant question as to whether organizational culture can be changed incrementally or whether it needs to happen in a revolutionary way. The configurationist approach (Meyer, Tsui, & Hinings, 1993) suggests that the fitting together of many aspects of an organizational form determines a finite number of workable configurations. Rather than try to find universal relationships between organizational variables, it makes more sense to describe specific configurations where more definite relationships apply. If a configuration is like an ecosystem—with all of the parts tightly interdependent—then different configurations might have very different relationships between these variables. Different ecosystems certainly would have different relationships between basic variables. This could certainly apply to organizational culture. Besides the question of fit between an organizational culture and other organizational variables, one expects the elements of the organizational culture—OC memes—to fit tightly together as well. Changes in an organizational culture would be expected to disrupt an entire system of OC memes.

Meyer, Tsui and Hinings (1993) point out this parallel with the biological concept of “punctuated equilibrium” (Gould & Eldredge, 1993). In evolution, species may be stable for a very long time. Then a catastrophic event destabilizes the system and rapid change occurs. Whole ecosystems also remain remarkably stable until that moment when everything becomes fluid. Then large shifts and readjustments are made. By applying this theory to organizations, we might expect long periods of stability punctuated by brief, revolutionary change until another stable configuration is discovered. Punctuated equilibrium suggests that evolutionary change is usually revolutionary. Incremental efforts will meet up with the resistance (homeostasis) of a very stable system. Unless there is a monumental instability injected into the system it remains too stable. The pieces all cohere too well for anything to change.
Given that the DSR model is a biological analogy and that punctuated equilibrium theory also comes from biology, it is not surprising that I should suggest that culture evolves in a punctuated manner. Real culture change needs to be fundamental and destabilizing. In fact, punctuated equilibrium might be a dynamic rationale for the Lewinian “unfreeze-move-refreeze” model. Like ecosystems, you cannot go easily from being a rain forest to being a savanna. Parts depend on each other and everything has to change so that it still all fits together.

Additionally, some configurations would be expected to be more stable and common than others. There are no ecosystems that you could describe as half rain forest and half savanna. Since fit is a critical variable, some fits of whole cultural systems are likely to happen more frequently. These could be described as cultural configurations. This also suggests a possibility (outside the scope of this paper) that when we look at the fit of OC memes, we must consider the environment to include many other variables such as economic, industry, strategic, and national culture variables. Fit becomes quite complicated.

As a further implication of the DSR model, we can better understand the integrity of a Kuhnian “paradigm” (Kuhn, 1970) and its parallels with organizational culture. It has sometimes been assumed that a paradigm resists change because of the invisibility of the premises upon which it rests. The DSR model suggests that it is not only first premises that maintain stability, but the interlocking coherence of the whole system. Similarly, Schein’s analysis of organizational culture also rests on the idea of a core of “underlying assumptions”. On top of this base lie the more accessible levels of culture. The image suggests a broad, largely hidden foundation upon which more and more superficial elements are added in layers. The elements on the top follow from the largely hidden assumptions that underlie them as a series of logical deductions follow from a first premise.
As noted above, Kuhn emphasizes that a paradigm is not an explicit set of rules that could be articulated, even hypothetically. When we look at a paradigm, we rarely find a first premise underlying it. The process resembles p-cognition more than a logical process of deduction. The pieces fit together in a pattern, not a chain of logic or a stack of levels.

The important implication from all of this is that an organizational culture and a paradigm cannot be changed simply by challenging an underlying assumption (Schein) or a correspondence rule (Kuhn). The reason that it cannot easily be unraveled is that its integrity rests not with this first premise but with the patterned structure of the coherent whole, including its environment. Kuhn wants to shift from the word paradigm to the more descriptive “disciplinary matrix” (Kuhn, 1974). This clarifies that incommensurability between paradigms is not only because there is no basis for comparing first premises but also because the comparison has to be between two whole systems. To be inside both systems at the same time seems difficult if not impossible. How can we say whether a rain forest or a savanna survives better? Each is internally coherent.

As a practical matter when we strive to help an organization, it is useful to look at hidden assumptions. Every time we do this we open up new possibilities and choices. However, we cannot expect that by simply pointing out the error of a single hidden assumption that we will change the organizational culture. An entire pattern—a memosystem—needs to be reconstructed into a coherent whole. We need to paint an entirely new picture of the organization and how all of the pieces fit together. Since each

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29 An interesting parallel exists in the field of dynamic psychotherapy. Early psychoanalytic technique focused on uncovering a central false premise that caused a neurosis. Later, analysts and therapists put more emphasis on the process of “working through”. Now the therapist engages the patient to reconfigure the entire personality by investigating all of the initial insight’s implications in the relationship with the therapist. Insight is only a part of the process.
fraction of the new paradigm is being rejected in terms of its fit with the old paradigm, it is difficult to gradually accumulate enough of the new paradigm to start cohering on its own terms. For a paradigmatic revolution to occur, an abrupt process might be necessary, where an entire memosystem is refuted and replaced at once. This gives some support for the idea of stable organizational configurations and that change may need to occur in punctuations of equilibria.

**Philosophical Implications and Conclusion**

Above I have clarified what the group level is and how it can be conceptualized. I have described a plausible connection between the individual and group levels that has not been fully developed before and should bear fruit in new theorizing. I have laid the groundwork for a more solid investigation of the processes of organizational culture change and organizational learning. In this last section I want to suggest some broader implications of the DSR model.

**Cultural Taylorism**

A basic feature of a Tayloristic approach to organizations was to separate thinking and planning from the carrying out of work. Management and workers were two classes of organizational members assigned to these two separate tasks. More accurately, the managers assigned the workers to carry out the work that managers planned. Much progress has occurred in participative management where workers are more involved in the thinking about and planning of work. Now, managers might realistically be concerned about their roles. As the organization needs managers less, one organizational response is to reduce their ranks. Another response might be to find new tasks for managers. Under the rubric of leadership, managers are now being asked to manage organizational culture.

There is some sense in this. If managers serve a coordinating function and organizational culture is seen as a coordinating process, then it seems natural for
managers to take it up. However, organizational culture—like many tasks in the organization—is widely distributed. Trying to centralize its administration can lead to serious folly. My first impression of one CEO that I came to know was from hearsay from several management levels below him. He was described as rather strange. He was found “managing by wandering around” (Peters & Waterman, 1982) with a referee’s whistle around his neck. He would use the whistle to punctuate his passionate appeals for the new cultural style. This CEO was evidently quite pleased with himself for following the plan of some equally self-pleased organizational culture pundit. However, the reaction of subordinates was to roll their eyes at him like the village idiot. Scott Adams’ syndicated Dilbert cartoons make the point frequently: when not everyone in the organization has ownership of a process, they are cynical and create counter-cultural interpretations of it. For example, they may conclude that the CEO is either self-absorbed or slightly lunatic. The CEO would have done better if he had seriously taken up the spirit of “managing by wandering around” rather than its trappings. That would have involved less theater and more listening.

This is the dilemma. Managing organizational culture is a distributed task because organizational culture is a distributed phenomenon. When an organizational culture program is disconnected from workers’ experiences it can be fatally misguided. Having the culture change agents disconnected from the organization is as dangerous as Taylor’s disconnection between planning and doing. Furthermore, when these kinds of programs target increasing participation, they often suffer a tragic irony. The process of encouraging participation distinctly excludes those who were to participate. This irony is rarely perceived by management and is almost always perceived by workers.

30 Perhaps a large-scale example of this irony is the Maoist China “cultural revolution”. To free the proletariat required extensive repression of the same. The espoused goals were derailed by the process of their implementation.
The antidote to Cultural Taylorism is to acknowledge that the organizational culture belongs to everyone in the organization (and perhaps even to some outside stakeholders). Stakeholders can share in formulating the direction its organizational culture will take. If a management function will be involved, it cannot be to control this process in the ordinary Tayloristic sense but merely to provide facilitative structures and parameters to allow this more organic process to proceed. Interventions such as the LGI discussed above are one possible format for accomplishing that. Other formats will need to be developed. I hope that the perspective given by the DSR model will help in directing such a shift.

**Autonomy and Responsibility.**

The autonomy of the individual working in an organization implies respect for their participation. But what is the implication of the autonomy of the organization itself? Do organizations have rights? Do they have responsibilities? This line of questioning leads to many paradoxes (see Jacques, 1996). Usually we retire from the discussion by placing rights and responsibilities back at the feet of individuals. Ultimately organizations matter to people, and so people have to be responsible and be held responsible. But the DSR points toward respecting the organization as a value in itself. Much as humanism made an ultimate value out of the individual, a new perspective on organizations could respect them also as an end in themselves. Being pragmatic, organizations will continue to need to be “put to rest” when they no longer serve a purpose. Individuals will see the inevitability of ceasing an organization that does nothing or does more harm than good. However, they will still mourn.³¹

³¹ This is a separate issue from mourning a lost place in a viable organization. This personal loss is not the same as the “death” of an organization itself.
An organizational culture can be valued as a unique human creation. Some organizations have broader influence than others. But each has some pull on individuals’ feelings, either positive or negative. On the large culture end of the scale are anthropological cultures, which are truly treasures and the passing of which brings great pain. Some large organizations might also have a very significant impact upon their cessation. The end of a small group of people meeting for just a few hours can have a sadness, but the degree is altogether different. If organizations come to have a life of their own, what is our responsibility to them?

If that question is difficult to answer it leads me to yet another difficult question. If an organization has its own autonomy and seems to require respect, what then are its responsibilities? This question parallels the dilemma above about whom organizations belong to. If they are just there to serve individuals, then they have little autonomous rights. But then they will also have little in terms of responsibilities. If they are just instrumental artifacts, then responsibility falls to those individuals that were benefiting from the organization. However, if conversely organizations have a life of their own, perhaps they have responsibilities as organizations. Though this sounds strange, we do in fact make this kind of attribution. For example, an executive of an organization can claim that she was just acting in a role on behalf of a corporation and perhaps reduce her own culpability. These are difficult issues and I am not certain that we even have good models for individuals’ responsibilities, so it is not surprising that organizational responsibility should be perplexing. One possible way out of the paradoxes this presents is to move away from responsibility being all in one place. This brings me to the question of relationships.

A “Pattern Which Connects”

My personal hope is that this perspective on the broad question of process emergence may have other unforeseen implications. In particular, I believe that the work
of Bateson, although widely recognized, is underutilized and undeveloped in many fields where it may have implications. The DSR model may be just one example of how these ideas can be further developed. Part of the benefit is appreciating the shift from reified things to seeing process emergence. In particular, stochastic modeling has power far beyond what has been developed here. That contribution is basically an extension of the Darwinian revolution in biological evolution. In its time and to the present it is a monumental change in how we can conceptualize causality. It explains how evolution can cause itself. Now it can explain how an organizational culture can do something similar.

Part of what is interesting in this is how it changes the place of humans in the universe. Darwin certainly had that effect by suggesting that we descended from apes rather than being created directly by God’s divine plan. Earlier, Copernicus had a similar effect in changing the physical center of the universe. Later Freud had such an effect by shifting the center of the human psyche to somewhere outside our awareness. The DSR model in its much smaller way also shifts focus from how individuals create organizations to how organizations create themselves. It helps moves the study of organizations further from the humanistic individual focused models we are familiar with. With each of these shifts described above there is potentially anxiety about a diminishing the place of humanity in the cosmos. This anxiety ought not deter these investigations, but it might also warrant some reassurance. If the DSR model provokes some anxiety, I can only offer that it also makes our world richer and more complex. In retrospect, it is easy to say that a shift such as the Copernican revolution was worth it (and inevitable). Ultimately the heliocentric vision of the universe (and its further lineage) is more interesting and much more useful than the tiny geocentric universe that preceded it.
In psychology, the Skinnerian revolution—inasmuch as it shifts our focus from psychological essences to something more discussible—also seems dehumanizing at first. I am coming to respect that letting go of our somewhat vain perspective on the centrality of individuality holds promise to broaden our knowledge more than it disappoints our vanity. If the DSR model in some ways seems dehumanizing (or post-humanist), the possible trade-off is that it also opens up a way to see something entirely new. It opens up the possibility that there are connections and parallels between processes at the individual level and those at the group level.

It is this sense of relationship between the two levels that offers some relief from the paradoxes of what level should manifest responsibility. The legal fiction of an organization as an “incorporated” individual has this psychological truth in it: that we see ourselves as individuals reflected in the learning processes of the organization. The DSR model gives us a new way to think of our relationship to the organization. Just as Bateson’s work allowed us to see the connection between evolution and mind, now we can also see a connection between the individual and organizational learning. Both levels share a pattern: a learning process. Perhaps Bateson would have been comfortable with the idea that the DSR model offers a new organizational aesthetic (and an aesthetic of the individual)—one that is part of what he liked to call the “pattern which connects”.

A Question of Meta-Culture.

I would like to briefly mention the impact that theory about organizational culture might have on organizational culture. Since organizational culture is dependent on a perception of a context, when we theorize about culture we at least potentially change cultures as well:

There is every likelihood that what we teach now to practitioners will create the very phenomena that we will have available to study in the future. Today's theories can enact tomorrow's facts. (Pondy & Mitroff, 1979, p. 28)
What is the role of conscious reflection on organizational culture? This paper represents some OC memes too. Or perhaps it is better thought of as a meta-meme. What kind of “double-loop” learning is it when we look at (represent) the process of cultural evolution, the process of changing a culture and so forth. We represent the culture as something that evolves, something that can be changed. We might be remiss to ignore this “meta-culture” about culture.

We need to be conscious of the fact that our theories impact our phenomena. What we write about today becomes a part of the phenomena of tomorrow.
References


