
Bringing About Changes in Workplace Behavior

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The Model of Hierarchical Complexity provides the basis to introduce and define how task actions are sequenced. It is applied to organizational and institutional atmosphere and its developmental relationship with individuals. We define and discuss stages of development as well as contingencies in workplace settings. We explain how a particular workplace's atmosphere specifies contingencies. Research is introduced to illuminate the concepts. We characterize the hierarchical complexity of peoples' work and of organizations in which they work. Formal stage organizations are characterized by bureaucracy, and one-dimensional logically-understood regulations. Systematic stage organizations look to the purpose of regulations, balance multiple relationships to achieve goals. Metasystematic stage organizations value creativity over conformity. We propose that the hierarchical complexity of the contingencies that constitute a particular workplace atmosphere affects how the individuals within it behave. Individuals' stage of performance is described by the hierarchical complexity of the task demands and contingencies that they discriminate and prefer. "Power" is explained as the behavioral control of contingencies that distribute reinforcement and reinforcement opportunity. We discuss the role of power in setting favorable conditions that reinforce individuals' development. Preliminary results of this research indicate that workplace atmosphere typically places a ceiling on individual moral development rather than encouraging development to the highest stages. The concepts are applied to the future of institutions such as research universities and organizations. Many companies have short lives because they become less creative over time. Their present "successful" culture resists innovation. Research universities and start-ups are the exceptional organizations. Some of the new start-ups are organized using Metasystematic principles such as Google.

Behavior analysis now addresses a number of useful organizational issues, such as getting people to work faster, more efficiently, and reducing worker turnover. Organizational behavior modification improves/maintains individual or organizational performance. Improving performance necessitates an increase in the quantity, quality, and timeliness of training. In turn, an improvement in performance increases customer, client, and investor satisfaction, implementation of mission objectives, and safety.

From a systems analysis perspective, improving performance effectively changes several things about a job. One is increasing the efficiency of the way in which work gets done. Another is that improving performance often necessitates an alteration of what individuals do in their jobs. This can result independently in the development of measurement systems for various units in the organization, which assists appropriate levels of organization to determine measurable goals for performance.

Hierarchical Complexity of People's Work and of Organizations in Which They Work

Commons, Krause, Fayer, & Meaney (1993) originally set forth a behavioral developmental account of stages of atmosphere

in organizations. In this paper, we update this account and analyze what might affect the survival and reinvention of organizations. This paper presents a method for characterizing the relationship between individuals and their workplace environment with respect to individual development in a variety of domains on a various tasks. We hypothesize that this is a dynamic, two-way relationship, and that connections exist between individual development and the stage of development embodied in the workplace environment. We construe development as the developmental stage of performance on tasks of importance in the workplace. Using a scoring scheme derived from the Model of Hierarchical Complexity (Commons & Richards, 1984a, 1984b, Commons, Trudeau, et. al, 1998), we have scored sample individual responses and compared the stage of individual responses to the stage of response required or embodied in organizational decision making, both formal and informal. We are particularly interested in identifying the contingencies by which this relationship is governed and the reinforcement mechanisms (Skinner, 1938) through which they are enforced. This paper describes a method for investigating and characterizing these relations that is nonarbitrary and highly precise.

Institutional atmosphere refers to the dynamic relationship between an institution and those individuals who comprise it. Atmosphere includes the contingencies that affect individual behavior within an organization and the methods by which contingencies are set. We define a *contingency* as a relationship between events (i.e., behaviors or responses) and outcomes. Consequences that increase the likelihood of the event that they follow are termed *reinforcers*. Consequences that decrease the likelihood of the event that they follow are termed *punishers*. What the environment contributes to behavior, we suggest, can be described in terms of contingent relations among events. We also maintain that the reasoning of individual members within any workplace has significant bearing upon organizational atmosphere. As reasoning develops in complexity, individuals are increasingly capable of understanding the perspectives of others, and of evaluating and integrating competing perspectives. These skills are integrated into the formal and informal policymaking and policy enforcement structures of the organization. The explicit statements of perceived organizational contingencies are referred to as *verbalized causal rules* or contingencies (Commons, Kantowitz, Buhlman, Ellis, & Grotzer, 2007). The implicit perceptions of causality are the *perceived causal rules* or contingencies.

In order to characterize atmosphere at the level of organizational macrostructure, we believe that it is necessary to examine the individual contingencies embodied in atmosphere, which constitute the organizational microstructure (Goffman, 1967). Microstructure and macrostructure are inseparable. Atmosphere is, therefore, a characterization of the sum of individual contingencies operative within an organization and as Kohlberg (1985) emphasized, their justifications. Atmosphere, therefore, refers to the manner in which the institution and individuals either constrain or motivate the development of individuals and the development of the organization.

Background

Because human experience unfolds almost exclusively in fields of activity that are interpersonal, social forces both act upon persons and provide the conceptual frameworks through which people understand the world and themselves. For example, Damon and Hart (1988) characterized self-understanding as basically a social process. This notion is not idiosyncratic, but stands in a strong theoretical tradition. As Mead (1934) and other theorists of the self (e.g., Kohlberg, Hart, & Wertsch, 1987) emphasized, understanding one's self is a social communicative act. Similarly, Durkheim's contention (cited in Thompson, 1985) that social processes fundamentally characterize the individual has found a significant following in theorists who contend that "each kind of community is a thought world...penetrating the minds of its members, defining their experience, and setting the poles of their moral understanding" (Douglas, 1986, p. 128). As Foucault (1979, p. 217) said, "The individual is carefully fabricated" in this interactive system of social structures.

Characterizing the interaction between individuals and their culture, however, has been a central problem. The problem is to account for the large variety of individual and cultural differences, while still providing a coherent framework that can be applied to many groups and individuals. With the exception of Chilton's (1988, 1991) work in political development, most explanatory models have typically fallen into one of two camps; namely, positivistic versus process theories. Positivistic interpretations, in the tradition of British and American analytic philosophy, offer reductionistic models of social processes and their impact on individuals. Such approaches attempt to find a single factor or group of factors to which learning can be reduced. The social world, in this view, is governed by fixed structures that exert a unidirectional force upon individuals. Because the locus of power is seated primarily within environmental factors, little attention is given to the ways in which individuals work a reciprocal influence upon social structures.

In contrast, process models (e.g., Barth, 1966; Moore, 1975) have rejected the notion of a strictly deterministic social world. Instead, they have offered generative models for interpreting the often unpredictable ways in which atmosphere and individuals reciprocally affect one another. Social systems are seen as grounded in the interpersonal interactions of concrete individuals, rather than in necessary, abstract social categories. Barth's (1966) model of transaction characterized this interaction as "the compounded effects which multiple independent actors, each seeking to pursue the transactional optimal course of behavior, have on each other" (p. 11), and social systems as "the gross frequentive patterns of behavior which will tend to emerge in such situations" (p. 11).

Such models contrast sharply with positivistic ones in that the former have located the foundations of social systems in the interactions of concrete individuals and in the shifting contingencies through which individuals impact one another. Social categories, in this view, emerge from particular sets of transactions rather than governing such transactions externally. Process theories have also assumed that change within social systems is both continuous and necessary. Change is construed as a natural feature of social systems with a twofold character. On the one hand, change arises as society responds to the actions of individuals. On the other hand, individuals change as they interact with others and with social institutions. The two sorts of change influence one another. These models, however, provide few resources for understanding the precise nature of this relationship at the microstructural level of individual development.

Positivistic theories tend to reduce complex interactions between society and individuals to a deterministic model. Process theories often lack sufficiently clear explication of the microstruc-

tural mechanisms that govern this interaction. Both positivistic and process models of social processes remain incomplete. They remain incomplete so long as they lack the conceptual resources to justify particular nonarbitrary links between the complexity of responses by individuals and the complexity of the atmosphere in which they function. Also, they must account for the real and unpredictable developmental variance observable among individuals at the same time.

The Model of Hierarchical Complexity (MHC), when combined with contingency analysis, provides just such resources. The MHC orders both individual and organizational processes in a nonarbitrary sequence. This sequence both affects and is affected by the contingencies in atmosphere. Further, the model describes formal processes through which individuals and atmosphere interact whether in the workplace, the family, or the state. The MHC also allows for a precise, microstructural analysis of these processes as they impact individual behavior. Moreover, the MHC accounts for a wide variety of individual behaviors and for the creativity and dynamism of organizational behavior as a continuous collective process. At the same time, it provides means for interpreting this relation in a nonreductionistic, nonarbitrary way.

Model of Hierarchical Complexity

The MHC is a universal system that classifies development in terms of the task-required hierarchical organization of response. The scoring of stage derived from the model is related to the first issue of microstructure because the MHC uses the hierarchical complexity of tasks as the basis for the definition of stage. An action is at a given *stage* when it successfully completes a task of a given hierarchical order of complexity. *Hierarchical complexity* refers to the number of recursions that the coordinating actions must perform on set of primary elements. Actions at a *higher order of hierarchical complexity* (a) are defined in terms of the actions at the *next lower* order of hierarchical complexity, (b) *organize* and *transform* the lower order actions, and (c) produce organizations of lower order actions that are new and *not arbitrary*. These next order actions cannot be accomplished by those lower order actions alone.

The discussion of atmosphere and its contingencies relates to the second issue of macrostructure. The two are interrelated insofar as reinforcement contingencies determine stage of response. The MHC provides a means for identifying how contingencies are set and transferred within organizations. Therefore, it gives a measure of the sensitivity of individuals to the reinforcement contingencies that shape social systems and individual development. To counter the possible objection of arbitrariness in the definition of stages, the MHC stages are grounded in the hierarchical-complexity stage criteria of mathematical models (Coombs, Dawes, & Tversky, 1970) and information science (Commons & Richards, 1984a, 1984b; Lindsay & Norman, 1977; Rodriguez, 1989). The MHC also posits that individuals perceive the world through conceptual frameworks. These frameworks embody the individual's cultural, educational, religious, political, and social background (as well as many other factors). Such a framework is referred to as one's perspective. Perspectives differ in terms of hierarchical complexity. As the hierarchical complexity of an individual's response to task demands increases (i.e., as stage of development increases), the individual is increasingly able to take many such perspectives into account (Commons & Rodriguez, 1990, 1993; Rodriguez, 1989).

Typically, the work of individuals and organizations fall within three stages of hierarchical complexity. The first is the formal stage, in which organizations are characterized by bureaucracy, and one-dimensional logically-understood regulations. The second is the systematic stage, in which organizations look to the

purpose of regulations and balance multiple relationships to achieve goals. The third is the metasytematic stage, in which organizations have contingencies that tend to be based upon absolute creative achievement alone. This means that the organization is not outwardly trying to conform to local culture or remain in popular favor.

In adult development, and consequently in professional-level workplace interactions, the same three developmental stages predominate: formal operational (MHC Stage 10), systematic (MHC Stage 11), and metasytematic (MHC Stage 12). Following are MHC descriptions of these stages framed in terms most relevant for workplace considerations.

Applying the Model of Hierarchical Complexity to Illustrate Examples

The Hierarchical Complexity Stage Scoring System (HCSS), derived from the MHC, was used to determine the stage of participants' responses to a given task demand. In HCSS, stage of behavior is regarded as a function of the hierarchical complexity of the actions required to solve a task. In distinction to content-based scoring systems, HCSS scoring involves an analysis of the microstructure of participant responses. There are two forms of responses. First, there are responses to items within instruments that embody specific statements constructed at a given order of hierarchical complexity. Second, is the hierarchical complexity of the inferred task that a person solves in a narrative may be found. In applying HCSS, the stage score of responses is usually equivalent (Commons & Grotzer, 1990) to scores determined through other procedures (Armon, 1984a, 1984b; Dawson, 2002; Colby & Kohlberg, 1987; Perry, 1970, 1981). Fewer statements, however, require "guess-scoring," or are designated unscorable. A further advantage of HCSS is that, theoretically, any statement is scorable. Scoring can, therefore, be applied across a range of tasks and is not limited to standardized dilemmas.

Formal Stage 10

Stage 10 responses identify and isolate relations in complex sets of variables as well as label interactions of events abstractly in a linear fashion. For example, in discourse at this stage, the verbalized perceived causal rules are empirical statements of causality and analytic if-then propositions. Such formal-operational statements have the formal structure of an order relationship, " $A > B$," where A and B are both abstract-stage propositions (MHC Stage 9). In forming justifications, the logical arguments at this stage usually have the form, " $A \rightarrow B$ ". That is, the relationship between A and B is made explicit through a causal statement with evidence, a logical statement or by some other clear coordination (e.g., of equivalence, proportionality) of at least two propositions or abstract-stage elements. Logical arguments are used to convince people of the soundness of a deduction from premises. Causal arguments are used to convince people of an empirical relationship between events and outcomes. For an empirical example, " A —If you hope to get a good academic job, then B —you must publish a good deal." " A —Also, if you hope to get a good academic job, then C —you must apply before the advertised deadline." Authority in the form of local norms, rules, and regulations is given preeminence, whereas particular individuals or situations play only a minor role. Reasons and justifications relate to expected behavior, based on these bureaucratic rules, or norms.

Systematic Stage 11

A Stage 11 response is characterized by systematizing formal stage relations into a network. Here, the products of the formal

stage actions—coordinated abstract-stage propositions—become the elements to be coordinated. The product of the more hierarchically-complex Stage 11 statement is the coordination of the relations constructed by formal operational actions into a system. A suitable systematic-stage action coordinates two or more relations, for example, System₁: " $A \rightarrow C$ and $A \rightarrow B$." This system could be "If you have a large number of publications, some teaching experience, and a coherent research program then you might get a good academic job." This constitutes a single, unified system, which the participant takes to be comprehensive. For example, social interactions are seen as integrated systems of relationships. Yet the importance of the individuals is determined with respect to their relation to and/or role in the system. Norms, laws, rights, duties, rules, and regulations form a logically coherent system; reasoning centers around how action would impact one's individual role and status within the system and the functioning of the institution.

Metasytematic Stage 12

A Stage 12 statement coordinates and transforms two or more systems according to a principle that is external to both systems. Such metasytematic principles take precedence over the concerns of any particular system. The concern is never to preserve a system or institution for its own sake. Rather, the needs and interests of a number of systems are taken into account without regard to the particular system or institution within which one finds oneself. Systems are compared and contrasted in terms of their properties. The focus is on the similarities and differences in each system's form as well as constituent causal relations and persons within it. At Stage 12, perspective-taking skills are well developed. A wide range of perspectives can be taken into account and coordinated in a non-arbitrary manner. For example, a metasytematic Stage 12 statement might have the form, "A merit system, $[S_1]$ —in which having a large number of publications, some teaching experience, and a coherent research program lead to a good academic job"—can be transformed into a discriminatory system, if "minority students are unable to work with faculty who have grants." The discriminatory system $[S_2]$ entails that "Students who work with faculty who do not have grants have a lower likelihood of publishing and forming a coherent research program than students who work with funded faculty," and "Minorities are less likely than non-minorities to have an equal opportunity to work with faculty who have grants." By adding these last two formal operational conditions, the system of merit $[S_1]$ is transformed into a discriminatory system $[S_2]$, written as $T_1(S_1) \rightarrow (S_2)$. In system $[S_2]$ past discrimination influences one of the merit criteria. Likewise, a merit system is transformed into a merit system with politics if active support from an influential person is required, $T_2(S_1) \rightarrow (S_3)$. Taking all these transformations together, one can build a metasytem out of these systems.

There are some organizations that are exceptions and do not fit into one of the three aforementioned stages of hierarchical complexity. Research universities and start-ups are the somewhat exceptional organizations. Many of these two entities tend to be organized using metasytematic principles.

Hierarchical Complexity of the Contingencies That Constitute a Particular Workplace Atmosphere

The contingencies that exist in a workplace often affect how the individuals within it behave. Individuals' stage of performance is described by both the hierarchical complexity of the task demands and the contingencies that they discriminate and prefer. Overall, most large organizations operating below the metasytematic stage last for only a short duration of a few to many decades. This is especially true in the technology sector. That is

because next quarter earnings so dominate. Such short term vistas make it almost impossible for these organizations to adapt to a dramatically changing world and markets. Systematic stage organizations are quite strategic in their respective short term ways. When a systematic stage organization becomes successful, several ultimately self-defeating actions may take place. They value conformity, productivity, low costs, efficiency of doing what has been successful in the past. There is also a payoff for just improving what is already being done, rather trying new things. The tendency towards low creativity thrives because there tends to be a high rate of payoff for doing the same thing and thereby eschewing creativity. In addition, going off in a new direction is not seen as having a positive outcome, especially if that new direction involves an innovation that might be disruptive to the current flow.

It takes metasytematic stage perspectives to compare what happens to companies and other organizations in the long run. At his stage, the need for disruptive innovation is often understood. Also, there is also recognition that it takes a good deal of time to develop anything requiring real research rather than just development. The innovators have to be protected from the bean counters. But at lower stages, innovation can be seen as disruptive in an organization, especially if the status quo is currently reaping the expected results.

Formal stage organizations as exemplified by many bureaucracies are not oriented to seeing even a complex multivariate world at all. This is due to the fact that conformity is often valued over creativity and they tend to show unchanging allegiance to their found rules and regulations.

Different cultures and different forms of ownership effect whether short or long term contingencies are effective. In the United States, most basic research is done in universities. Universities do not have to sell their professors' research efforts beyond getting some of that research funded. It may be that privately held companies take a longer term view. It also may be that some cultures can take a longer time view, such as might be the case in the Far East.

An example of disruptive innovation is when people left Fairchild Semiconductor to found Intel (computer processors and integrated chips, especially memory). Fairchild was frozen in its approach to the field. Wang developed a very successful word processor that was not an inexpensive PC. But then Apple came along with WordStar running on it and put it out of business. WordPerfect made a WYSIWYG word-processing package that had word wrap and a speller. It put WordStar out of business. When WordPerfect was too slow to make its word processor run under Windows, it lost almost all its market share. Other examples of organizations that have developed and changed include:

1. *Apple Computer and Steve Jobs*: Creation of Apple 2 computer, Mac computer, Pixar films, and the iPod. The iPod along with extremely small MP-3 players have provided a downloadable way of obtaining media content including music at less cost than CDs sold by record stores. This has put out of business most record stores. Our media will come to us either by fiber optic cable or wirelessly in the near future. But Apple continues to innovate.
2. *Motorola*: Developer of car radios, produced semiconductors on those radios and then all of industry, and finally increased market share in the cell phone industry
3. *IBM* (International Business Machines): Progressed from Card Readers and punches to electric typewriters to mainframe computers to PCs and now to software and system service.

4. *General Electric*: Light bulbs → Generators → Appliances → Locomotives → Jet Engines → Finance → Plastics and silicone products

Development and Propagation of Atmosphere

Although individuals are constrained by the stage of atmosphere, at the same time the stage of individual responses continually reproduces and may revise the stage of atmosphere. This interactive relationship requires the effective transfer of information regarding the operative contingencies in any given situation. The transference of cultural information (Boyd & Richerson, 1982, 1985; Cavalli-Sforza & Feldman, 1981; Cavalli-Sforza, Feldman, Chen, & Dornbusch, 1982) carried by contingencies can be described analogously as *infection* by *memes*. A *meme* is a unit of sociocultural information. It is defined by a single individual dichotomous choice (Dawkins, 1989). Choices are under the control of contingencies. Such contingencies specify the stimulus conditions and form of responding that will lead to reinforcement. Memes are released from the atmosphere and carried by particular sets of operative contingencies. Atmosphere constitutes the source of memes insofar as it specifies contingencies. In detecting a set of contingencies that apply in a particular situation, an individual is thereby *infected* with the meme carried by those contingencies. In executing a behavior that is controlled by that set of contingencies, the individual is further infected. Thus, there are degrees of infection by memes. Moreover, because any contingency selects behavior, it can represent one or more memes. The person may learn what the contingencies are from observing what others do and the effect it has, by instruction, by reading, or imitating others without detecting the effects of the others' behavior.

The infecting meme can be identified in the participant's resulting behavior. Because new behaviors set new contingencies, memes are continually being transferred. All effective educating, training and communicating results in a transmission of memes. If such infection did not exist, individual choices would be random or unperformed. The identification and tracking of memes brings precision to the task of describing social conditioning so that it becomes possible to trace the evolution of behaviors. This is why the history of mathematics and science is relatively easier than, for example, understanding the American Civil War. We know that Newton and Leibnitz both invented the Calculus; Archimedes almost did but stopped short. Moreover, because memes may be characterized in terms of stage, they aid in identifying stage development of individuals within interactive frameworks such as the workplace.

The atmosphere of the workplace is sustained and transferred through communication networks. These networks carry the memes. These networks distribute information about the contingencies that affect individuals (for example, individual advancement) within the organization. Two things define the stage of the atmosphere of the workplace. First is the stage of the actual contingencies. Second is the stage of the reasoning used to justify these contingencies. The detection of contingencies by individuals occurs primarily during acquisition or reacquisition of the stage reinforced by the atmosphere. Contingencies tend to go undetected once the individual and the atmosphere are functioning at the same stage. Contingencies are revealed in stark relief only when the individual is struggling against the atmosphere from the point of view of another stage, or when the individual is excluded from power.

Social forces impact individuals in different combinations and with varying degrees of intensity. Because the variables are numerous and frequently unperceived, the character of this interaction between atmosphere and individual is often obscure. Nevertheless, we would argue that reinforcement

contingencies are the immediate controlling relationships for both individual and organizational behavior. In their work on education, for example, Commons and Hallinan (1989) demonstrated that reinforcement helps people form strategies and representations which include both the implicit perceived causal rules, and the explicit verbalized rules. Reinforcement also leads them to select the more successful strategies, and causes them to continue actively solving the problems. By reinforcing more (versus less) developed strategies during students' progression to formal operations, a teacher can reinforce students' more complex reasoning (Commons, Handel, Richard, & Grotzer, 2007; Richard, Unger, & Commons, 1988).

Commons, Grotzer, & Davidson (2007) have recently demonstrated this in a study of a large number of young students from mixed socioeconomic backgrounds. All students were asked to solve a series of adult-stage problems requiring them to detect causes. The students were divided into three groups: one group of students received no feedback about its performance, a second group received feedback alone, and a third group received both feedback and points for correct answers. They were told that their team could accumulate these points to win a prize. A fourth, control group of students took only the pretest and posttest without undergoing the problem-solving task series. Only students in the reinforcement (i.e., in this case, points leading to possible prizes) group improved their proficiency in detecting causal relations from the pretest to the posttest. Students who received no feedback and those who received feedback without reinforcement did not demonstrate this stage development. These students did not learn any more than the control students. The study implies that, even when academic achievement does not motivate some students, all students' reasoning can develop when success receives the appropriate reinforcers.

We suspect that the hierarchical complexity of the contingencies that constitute a particular workplace atmosphere affects the patterns of individual choice making within that organization. As the hierarchical complexity of an individual's response to task demands increases (i.e., as stage of development goes up), the individual is increasingly able to take the perspectives of others into account (Commons & Rodriguez, 1990, 1993; Rodriguez, 1989). Successful decision making in the workplace demands proficiency in taking a variety of perspectives into account, particularly the perspectives of those individuals whom one's decision may affect. In situations involving conflicting viewpoints, individuals need to understand both the perspectives of other people and the frameworks that shape those perspectives. The better one's perspective-taking skills, the better one's managing skills (Weathersby, 1992). When the perspective of an individual or group is excluded from the decision-making process, unresolved tensions often dominate the workplace and may hinder productivity.

Organizations in which decision making is grounded in lower-stage perspective-taking may perpetuate an atmosphere in which individuals' higher stages of perspective-taking are not reinforced. These individuals are likely to demonstrate interest only in how decisions affect themselves. Consequently, organizational decision making that excludes the perspectives of constituent groups may ultimately produce constituent decision makers who exclude the perspective (and interests) of the organization. At the higher stages of perspective-taking, by contrast, organizations reinforce individual behavior that takes the perspectives of others into account. This may include other members of the organization, the organization itself, and even individuals and groups that lie beyond its boundaries.

Reciprocal Effect of Stage of Individual Actions and Atmosphere

It is our contention that the stage of the behavior that sets contingencies has a reciprocal effect on the atmosphere of an organization. For example, when the people who set government policy in the United States have to raise millions of dollars to be elected, the power of the individual relative to the power of the dollar is small. In such circumstances, incumbents—because of access to large amounts of funds—have a great advantage over challengers. Such incumbents set the rules or contingencies for how elections are to be conducted. In a first-past-the-post voting system, rather than a proportional representation system, two parties usually emerge. These dominant parties shut out small ones even though there is no mention of parties in the US constitution. It is curious but true that worker owned companies are not competitive. What happens is that workers have a conflict of interest; one is to keep their jobs, make more money, and work safer and easier. But as owners, they are to reduce the number of workers, keep the pay low, and maximize profits. So the social system has owners, managers and employees. As the stage of the employees' representatives goes up, they less often help put the company into bankruptcies. At the systematic stage, they realize the multivariate nature of the determination of wages: having a job, getting paid a certain amount, and having an increasing level of productivity.

Likewise, within the workplace of the university, the transmission of knowledge and values is controlled by a network of contingencies. These contingencies begin with the persons who pay for the university. Then there is the structure of the channels through which funds are allocated to universities and then distributed within them. The stage of the justifications given for accreditation and for the form of governance partly determines the stage of the institutional atmosphere. This includes a ceiling on the stage of development of the institution's top decision makers. The ceiling is set very high (metasystematic) from our data collected by undergraduates and graduates (Johnstone et al., 1991) on the presidents of Harvard and similar institutions. This is because the presidents have to meld many different perspectives of the different fields and schools. They also have to relate their own system to the system of the big donors and providers. They have to attract students and faculty. The boards replace presidents who fail at any of these tasks. The transmission of knowledge and values to students within the university can be traced through a series of steps: (a) through the contingencies that describe how the top decision makers are chosen and how a ceiling is set on the developmental complexity of their behavior; (b) through the contingencies that describe how money is distributed to the various sections of the university, how staff are chosen in those areas, and how power is distributed within them; and (c) the contingencies that establish the rules (both implicit and explicit) themselves that govern how future contingencies develop. We believe that similar processes govern the transmission of knowledge and values, and influence the developmental stage of individuals within any workplace.

In most universities, the control of funds is inaccessible to students, such that students can influence decision making only by attending or not attending school. In rare cases they protest. Faculty members, on the other hand, represent long lasting human capital that uses and, indirectly, produces funds. Their power is derived from the fact that they exercise some control over these resources as well as influence the perceived value of the university experience. *Power*, from our viewpoint, is the behavioral control of contingencies that distribute reinforcement and reinforcement opportunity. To say that Person A "has power over" Person B in a given situation is, then, to say that Person A controls more reinforcing outcomes and punishers with respect to Person B's

behavior than the reverse. If Person B behaves inappropriately according to Person A, reinforcement may be withdrawn from B by A. The implicit or explicit rule that A follows is contained within the network of contingencies operative within the organization. The sum total of such rules and the rules by which they are set constitutes the atmosphere.

In their empirical study of moral development in worker-owned companies, Higgins and Gordon (1985) found that the organizational structure of a workplace (i.e., atmosphere) may facilitate the sociomoral development of its members. Similarly, in an exploratory study of atmosphere and moral development in the academic setting, researchers (Johnstone et al., 1991) found that the atmosphere of the university may constrain the developmental complexity with which its members respond to ethical dilemmas. For example, one participant reported that the perceived compromise of values by administrators "very much tells the students that, well, this is all very interesting, but what really counts is big bucks, and what really counts is.... And kids get the message, and kids will go over exactly where they see the reward of the society as being exemplified." Similar processes set contingencies for faculty members, staff, and administrators as well. In fact, the study revealed that the reasoning of most ethics professors fails to achieve the metasystematic developmental stage. Johnstone et al. explained this finding by arguing that the institutional atmosphere of the university fails to reward more

complex reasoning that may challenge its norms and system needs. Such metasystematic-acting individuals would base their decisions on universal abstract principles.

There are multiple layers of contingencies operating at different stages for individual responses within such complex organizations as the modern workplace. The hierarchical structure of stages of development, as given by the MHC, suggests that lower stage tasks and responses must be adequately integrated into the contingencies that constitute atmosphere in order for higher stage responses to develop. By the same token, some tasks do not require higher stage solutions yet are necessary for the functioning of the institution. Contingencies and stage of response will be perceived differently by individuals functioning at different stages within the same workplace. This means that people functioning at the concrete stage may help clean buildings or other tasks where they get direct supervision and authority is absolutely clear. They may work for supervisors that function at the abstract stage following the established norms for the quality of work and the speed of its completion. These people may be supervised by bureaucrats functioning at the formal stage. The organization as a whole might have very open communication not only from the top down but from the bottom up. Responsibility for high quality task completion might be placed as low as possible. The organization, company, or business that reinforces higher stage responses fosters allegiance to its own causes and interests.

Table 1. Classification of organizations, and positions minimally requiring the following stages

Stage	Type of Organization Activity	Positions Person	Social Structure
Primary 7	Individual who works for others and is closely supervised	Cleaning person, Errand runner	Individual
Concrete 8	Individual vendors	Individual physical laborer	Clique
Abstract 9	Family or small number of individual's company	Filing Clerks, Typists, Elementary School Teachers	Small Group
Formal 10	Single niche company	Secretaries, Technicians, High School Teachers, Whistle Blowers	Bureaucracy
Systematic 11	Regular small to large companies and organizations	Managers, Professionals, College Professors	Institution
Metasystematic 12	Learning and developing companies and organizations (See Morris, 1992, 1995)	Innovators & Leaders, Research Scientists and Professors, Major Artists, Appellate Court Judges	Universal
Paradigmatic 13	Organizations that reinvent themselves by adopting new paradigms	-	-

Note: We have no knowledge of positions or social structures at stage 13.

Stage assignments can be made for the overall network of contingencies and responses that constitute the atmosphere of the organization. In other words, the atmosphere of the organization can be scored for its stage. We believe that the reinforcement contingencies set by organizational activity play a vital role in the development of individuals within the workplace. We believe that the organizational atmosphere largely controls the reinforcement contingencies impacting upon individuals within a particular workplace. The setting of contingencies is the exercise of *power*. The atmosphere can either assist in the developmental process of individuals and the organization or impede them. Using the MHC, we can characterize this interaction with a high degree of precision.

Does Atmosphere Place a Ceiling on Individual Development?

The preliminary results of this research indicate that workplace atmosphere typically places a ceiling on individual development rather than encouraging development to the highest stages. The ceiling identified in the samples from the Mexicali

Medical School study was at the formal stage (Galaz-Fontes, Pacheco-Sanchez, & Commons, 1989; Meaney, 1990). In the samples from the Harvard study, transitional reasoning between Stage 11 and Stage 12 predominated, at least in the social domains investigated. We suspect that in less politically charged arenas

many reasoned at the fully metasystematic Stage 12. This suggests that behavior beyond the systematic stage is reinforced in some domains and not in others. For instance, in the university, one's postconventional (metasystematic) thinking in one's research might be reinforced, but not one's postconventional thinking with regard to policy decisions involving the university itself. This theme was clearly brought out in many of the interviews.

At the metasystematic stage, individuals in the workplace are not simply defined in terms of their position or status within the organization. Individuals are considered in terms of a wide range of perspectives, all of which may be taken into account in the decision-making process. Metasystematic responses typically challenge the existing norms and policies of a workplace by integrating perspectives that fall outside of the organizational bureaucracy. For this reason, organizations tend not to reinforce responses at the metasystematic stage. We contend, however, that the failure of systematic stage reasoning to integrate a range of workplace perspectives is contrary to organizational interests. Someone in an organization that reinforces higher stage responses to dilemmas thereby increases the perspective-taking abilities of its members. The better the perspective taking skills of individuals within an organization, the more likely they will be to integrate the organization's perspectives into their own decisions. In practical terms, this may be called loyalty or allegiance.

Conclusion

We have provided a framework for research on the interaction between workplace atmosphere and the development of individuals within it. The applications of this model extend far beyond the workplace. This model may be applied to forms of social interaction as various as families, religious groups, street gangs, and governments. We believe that contemporary challenges in all of these spheres increasingly call for postconventional responses on the part of both individuals and organizations. The Model of Hierarchical Complexity provides a model for understanding the developmental processes involved in creating these challenges and some types of interventions through which these challenges may be met.

Despite our discussion on workplace behavior, there are still many unknowns involving organizations such as universities. Will universities expand their distance learning program to the maximum? What happens to the research role of the professor? Will Harvard, Yale, Princeton, Stanford, and the like establish franchises like the UC system did to remain competitive utilizing their brand name? Will cross-disciplinary research become the norm? There are also questions about the future of behavior analysis. Will it be like single culture companies that go extinct? Will it continue its orthodoxy? Will it learn that single participant design is good for science and intervention but bad for policy decisions? Will it accept group statistics for policy decisions? Will it embrace disruptive ideas such as development? Will it integrate its quantitative side into its practice side? Will it be part of psychology?

Organizations do not change without a change of leadership and then change is still very unlikely. When the organization is about to fail is the most likely time for change to occur. So we are left with evidence the organizations are changing but with a possible myth that there is internal change. What is more likely the case is the new organizations with higher-stage atmosphere replace older lower-stage-of-atmosphere organizations. This process of change feels glacially slow to people within organizations, yet in historical terms, it is very rapid.

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