Structural Contingency Revisited

Toward a Dynamic System Model


Structural contingency theory can be reduced to the following equation: Organizational environment/technology/uncertainty correlate with organizational structure, such that turbulent environment/unit technology/high uncertainty produce an organic structure, while their opposites produce a mechanistic one. The better the fit, so defined, the higher the effectiveness of the organization (e.g., Burns & Stalker, 1961; Pennings, 1975).

Although the structural contingency theory was developed during the early 1960s, its appeal to practitioners and business school academics has not diminished. The theory is still endorsed as a managerial tool, and guidelines based on the contingency model continue to appear in managerial textbooks (Daft, 1995; Mintzberg, 1979). It is still attractive because it makes logical sense (to scholars as well as to managers), but scholars have been frustrated by the fact that numerous research efforts have yielded only fragmented empirical support for the theory. Whereas early research was supportive (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Woodward, 1958), subsequent studies have failed to produce consistent supporting evidence (Dewar & Werbel, 1979; Fry & Slocum, 1984; Kopp & Litschert, 1980; Mohr, 1971; Pennings, 1975). Refinements in the contingency equation that were offered over the years (Child, 1972; Lewin and Stephens, 1994; Schoonhoven, 1981) did not enhance support for the theory.

This state of affairs raises some interesting questions. For example, why it is that managers are willing to accept the core arguments of the contingency approach, even though their organizations never seem to reach the desired fit? Are we facing problems familiar to social psychologists, namely that gaps exist between attitudes or intentions to behave and the behavior itself (Fishbein & Ajzen, 1975)? Furthermore, if environmental or technological changes cannot predict changes in organizational structure, are they at least capable of predicting the fit between environmental changes and decision makers’ intentions to implement given structural changes?

In the present article, we propose an expanded model of structural contingency theory (see Figure 1). The model consists of three elements: triggers of uncertainty embedded in the organizational system, feelings of uncertainty, and decision makers’ responses. This expanded model allows for a complex systems view of structural contingency, based on the above three elements. The nature of such a complex system determines the organizational structural responses.

In contrast to traditional approaches, it will be argued that feelings of uncertainty are actually the independent variable of contingency theory. These feelings are a response to decision makers’ perceptions of triggers of uncertainty that are embedded in the organizational system.
Based on an extensive literature review and analysis, it will be shown that both environment and technology can be characterized according to two dimensions, system properties and system changeability, although only perceptions of the latter dimension trigger feelings of uncertainty.

Fig. 1: Expanded structural contingency model

The third element of the model, decision makers’ responses aimed at coping with uncertainty, includes both structural changes and use of learning mechanisms. It will be argued that the ability to attain structural fit depends on changeability: When rapid environmental changes do not permit the adoption of a new structure, internal processes, such as learning mechanisms, are adopted by decision makers in order to facilitate continuous adjustment to the rapidly changing environment or technology.

TRIGGERS OF UNCERTAINTY: THE ROLE OF ENVIRONMENT AND TECHNOLOGY

Structural contingency theory asserts that “the appropriate organizational structure depends on the contingencies confronting the organization” (Pfeffer, 1978: 29). However, as Pfeffer (1978:33) notes, “to state that structure is contingent begs the question, contingent on what?” In other words, what is the “root cause” of the process of structural change? Three variables have traditionally been suggested: environment, technology, and uncertainty. While the first two concepts have been linked to the level of environmental turbulence (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Thompson, 1967) or to the complexity of the transformation process (Hage & Aiken, 1969; Perrow, 1967; Thompson, 1967; Woodward, 1958, 1965) respectively, the third, uncertainty, has been posited to supersede environment and technology, or to mediate their effect on organizational structure (Pennings, 1975).

As argued earlier, feelings of uncertainty underlie the change in decision makers’ attitudes toward the existing structure and lead them to devise a new one. These feelings are brought about by perceptions of the objective state of the environment and technology of the organizations in which those decision makers operate. In the following pages the triggers, or sources of uncertainty, embedded in either environment or technology are reviewed and incorporated into a comprehensive framework.

Traditionally, both information and decision theories have viewed uncertainty as a characteristic of situations where the set of possible future outcomes (related to decision elements) is identified, but where the related probability distributions are unknown, or at best known subjectively (e.g., Garner, 1962; Luce & Raiffa, 1957; Owen, 1982). The decision maker, according to Bell et al. (1988: 20), “confronts an array of states-of-the-world, one of which will ultimately prevail and, given his usually vague information about which of these states will prevail, he must choose an action.” According to this definition, uncertainty does not reflect the decision maker’s feelings, attitudes, or behaviors elicited by these situational characteristics. Rather, it is a set of triggers embedded in the situation that can be precisely defined and operationalized experimentally. In other words, a situation is considered uncertain when the relevant decision makers do not have information about environmental factors, and when they have difficulty predicting external changes (Duncan, 1972; Galbraith,
1977), and the level of uncertainty is a function of the changes in the environment and not a function of how the decision makers perceive them and feel about them. Many organizational scholars have adopted this view (Burns & Stalker, 1961; Duncan, 1972; Emery & Trist, 1965; Hage & Aiken, 1969).

**TRIGGERS EMBEDDED IN THE ENVIRONMENT**

Early studies using “environment” as the independent contingency variable operationalized it—often unknowingly—in terms of uncertainty. For instance, Burns and Stalker (1961) considered environmental uncertainty to be the result of changes in market composition and in technology; Emery and Trist (1965) for their part identified four types of environmental texture—the placid-randomized, the placid-clustered, the disturbed reactive, and the turbulent environment—that represent various levels and types of uncertainty.

Recognition of the environment as a proxy for uncertainty becomes more pronounced in such studies as Downey et al. (1975) and Tosi et al. (1973). Likewise, Shortell (1977) and Jurkovich (1974) also utilize terms implying uncertainty in their definition of “environment,” such as instability, complexity, diversity, and so forth. More explicit in their recognition of uncertainty are Pfeffer and Salancik (1978), who view a decline in forecasting capability as a key dimension of the independent variable in the contingency model. The most explicit in his reference to uncertainty is Child (1972), who distinguishes between characteristics of environmental variability and experience of uncertainty. According to him, environmental variability is the main source of uncertainty and is a function of three variables: the frequency of change in the environment, the degree of difference characterizing each change, and the degree of irregularity in the overall pattern.

**TRIGGERS EMBEDDED IN THE TECHNOLOGY**

A number of studies utilizing technology as the independent variable in the structural contingency equation emphasized its relationship to uncertainty. These studies provided nominal definitions of technology rather than discussing its uncertainty implications. The relationship to uncertainty, however, is quite apparent in most of the writings.

The first to view technology or, in effect, the nature of the transformation process in the organizational subsystem as the variable on which structure is contingent was Woodward (1958). Her study of 100 manufacturers classified technology according to complexity and described three types of production: unit or small batch, mass, and process. In this study, the relationship of technology to uncertainty can easily be shown. Unit production, for instance, involves a higher level of uncertainty than does mass production because manufacturing requirements are less predictable.

More elaborate classifications developed later, such as Perrow’s (1967), can be linked to uncertainty as well. Exceptions, defined as the “number of exceptional cases encountered in the work”—that is, the degree to which stimuli are perceived as familiar or unfamiliar—clearly indicates uncertainty; search, which is “taken by the individual when exceptions occur,” reflects the individual’s information paucity and conveys a response to uncertain situations. Thompson’s (1967) three-way classification of technology as long-linked, mediating, or intensive also has clear implications in terms of the uncertainty it generates for organizational decision makers. Long-linked technology involves serial interdependence such as in the mass-production assembly line. Repetition provides for experience, which, in turn, provides a means for eliminating imperfections, thus creating a stable set of operational requirements. Intensive technology, on the other hand, signifies that a “variety of techniques is drawn upon in order to achieve a change in some specific object; but the selection, combination, and order of application are determined by feedback from the object itself” (Thompson, 1967: 17). Such
technology requires a custom combination of selected capacities and hence involves a higher level of uncertainty.

Studies using technology in a narrow manufacturing context also imply that uncertainty is in fact the independent variable. This is true, for instance, for Blau et al.’s (1976) degree of mechanization of manufacturing equipment, Negandhi and Reimann’s (1973) focus on the degree of continuity in the production process, Leatt and Schneck’s (1982) degree to which knowledge about raw materials is insufficient, and Hickson et al.’s (1974) degree of rigidity and automation. For example, the more rigid the manufacturing process, the less the uncertainty facing decision makers with regard to task definitions and skill requirements (see also Alexander & Randolph, 1985; Reimann, 1977).

**CONTENT ANALYSIS OF UNCERTAINTY TRIGGERS EMBEDDED IN THE ENVIRONMENT OR TECHNOLOGY**

A content analysis was conducted of all definitions of uncertainty used in empirical studies that focused on the structural contingency model and were published between 1960 and 1991, with earlier landmark works, such as Woodward’s (1958), included. All the studies that addressed the contingency equation directly were published before the beginning of the 1990s. Since then no attempts have been made to test the model empirically.

The content analysis performed on the reviewed studies, which used both environment and technology as the independent variable, shows that they share the same dimensions of uncertainty triggers (see Table 1). The analysis indicates that the independent variable in the structural contingency theory comprised four dimensions:

1. **Number of relevant factors.** This source, or trigger, of uncertainty refers to the number of considerations taken into account by the decision maker. Definitions such as the “number of countries served by a firm” (Van de Ven & Ferry, 1980), “number of operating sites” (Pugh et al., 1969), “number of commercial banks which operate in the market” (Pennings, 1987), “number of sources of support” (Tolbert, 1985), and “number of patients who have more than one diagnosis” (Leatt & Schneck, 1982) are examples of this category. The relevance of each factor resembles what some researchers call “factor centrality” (Tung, 1979).

2. **Factor diversity** is of two types: diversity among factors that affect the decision maker, and diversity within each factor. Thus, it incorporates, for example, “the degree to which nursing techniques vary between patients” (Leatt & Schneck, 1982) as well as “variation in seniority of customers, education and income” (Pennings, 1987), and the “variety of clients from case to case” (Sharder et al., 1989).

3. **Factor connectedness** refers to the degree of interdependence among factors. It includes both the extent to which the various factors are connected and the extent to which the behavior of one factor is mediated or moderated by the behavior of the others. Connectedness is not synonymous with dependence. Whereas dependence represents the effect that a central factor has on the decision maker (Pfeffer & Salancik, 1978), connectedness relates to the degree of covariance among all the factors affecting the decision maker. Examples of dependence can be found in Hrebiniak’s (1974) definition “the extent
Classification of operational definitions of uncertainty

Number of relevant factors
Number of environmental factors (Smith et al., 1979)
Number of factors in the internal and external environment to be taken into consideration by the decision maker (Tung, 1979)
Number of countries served by a firm (Van de Ven & Ferry, 1980)
Number of operating sites (Pugh et al., 1969)
Number of sources of support (Tolbert, 1985)
Number of commercial banks operating in the market (Pennings, 1987)
Number of patients who have more than one diagnosis (Leatt & Schneck, 1982)
Number of problematic patients who require flexible and special treatment (Leatt & Schneck, 1982)
Number of patients presenting a wide variety of problems (Leatt & Schneck, 1982)
Number of different service programs provided by the ES officers (Van de Ven & Ferry, 1980)
Number of households of the offices’ standard area above certain income (Pennings, 1975)
Number of different types of clients’ disabilities with which the organization deals (Dewar & Hage, 1978)
Different sources of environmental factors that construct environmental complexity (Hrebiniak & Snow, 1980)
Environmental factors that have an important bearing on the performance of each task (McDonough & Leifer, 1983)

Factor diversity
Differentiation of environmental factors (Tung, 1979)
Degree of differentiation between environmental factors (Smith et al., 1979)
Degree of diversity and differentiation of markets, type of customers (Khandwalla, 1977)
Degree of daily differences among patients and within the work process and differences within the same day (Hage & Aiken, 1969)
Degree to which nursing techniques vary between patients (Leatt & Schneck, 1982)
Variety of clients from case to case (Sharder et al., 1989)
Variety of clients’ problems (Sharder et al., 1989)
Variety of problematic cases (Sharder et al., 1989)
Variety in cases, claims, and clients encountered in a working day (Van de Ven & Delbecq, 1976)
Variety of possible customer needs that the firm can satisfy through products and services sold (Paulson, 1980)
Variety of products and the difficulty of producing them (Dewar & Hage, 1978)
Variation in: a) seniority of customers; b) education; c) income (Pennings, 1987)
Percentage distribution of sales based on scaling from standard products to customer specifications (Collins & Hull, 1986)
Proportion of present and potential customers in a local business area who put money each year into—if at all—seven kinds of investments (Pennings, 1975)
Factor connectedness
Organization’s dependence
Dependence of the focal organization on other organizations (its suppliers and customers) (Horvath et al., 1981)
Dependence on local markets for sales, production, materials, suppliers (Zweerman, 1980)
Degree of involvement with clients (Dewar & Hage, 1978)
Extent to which the factory depends on customers and suppliers outside of the parent company (Marsh & Manari, 1980)
Seriousness of the environmental factors’ impact on the focal unit operations (Tung, 1979)
Rate of overall level of resource availability to the company in each country (Ghoshal & Nohria, 1989)
Manager’s perception of the constraints dictated by the environment, such as suppliers, government, financial institutions (Yasai-Ardekani, 1989)
Degree to which an organization is tied to others in its environment (Kuc et al., 1981)
Degree to which the environment limits the organization in its political, economic and social operations (Khandwalla, 1977)
Dependence on other high-authority organizations (Reimann, 1977)
Degree of dependence of the focal organization (the factory studied) on its parent organization (Marsh & Manari, 1980)
Organization’s dependence on its parent organization (Pugh et al., 1969)
Dependence of the focal organization on its parent organization (Horvath et al., 1981)
Status in relation to the parent organization (Pugh et al., 1969)
Status of the organizational unit (Negandhi & Reimann, 1973)
Status of the organizational unit (Inkson et al., 1970)
Status of the organizational units (Hickson et al., 1974)
Nature of public accountability of the firm (Negandhi & Reimann, 1973)
Public accountability of the group (Inkson et al., 1970)
Impersonality of origin (Inkson et al., 1970)
Impersonality of origin (Negandhi & Reimann, 1973)
Size of unit studied relative to the plant organization (Negandhi & Reimann, 1973)
Size relative to owning group (Inkson et al., 1970)
Size relative to parent organization (Hickson et al., 1974)
Source of funds (Freeman, 1973)
Degree to which sources of information are needed as inputs in the process. These sources may consist of other units inside or outside the organization, or higher levels within the organization (Gresov, 1989)

Connectedness
Statements characterizing rigidity/interdependence of workflow processes (Lincoln et al., 1986)
Extent to which individuals in a workgroup feel the necessity to work with others and think it is their job requirement (Fry & Slocum, 1984)
Extent of the necessity for checking or working with others (Hrebiniak, 1974)
Degree of market competition (Negandhi & Reimann, 1973)
Competition in local or divisional markets (Alexander, 1991)
Degree of perceived competition in the environment, in price and product quality (Yasai-Ardekani, 1989)
Degree of price competition among manufacturers of similar products (Negandhi & Reimann, 1973)
Intensity of competition the company faces in each market (Ghoshal & Nohria, 1989)
Intensity of competitive pressures in the industry for factors such as purchasing, manpower, and marketing and their relative importance (Singh, 1986)
Intensity of competition in purchases, inputs, technical manpower, marketing and sales, quality, variety and price of products (Khandwalla, 1977)
Backlogs of orders for a product (Negandhi & Reimann, 1973)
Number of alternatives or competing brands available to the consumer (Negandhi & Reimann, 1973)

Factor changeability
Predictability of amount of time to be invested in solving difficult problems and predicting the results (Van de Ven & Delbecq, 1976)
Ability of the decision maker to predict actions and changes in various task environment sectors (Koberg & Ungson, 1987)
Ability to predict competitors’ actions and consumers’ demands (Miller & Droge, 1986)
Ability to predict environmental changes accurately (Koberg, 1987)
Ability to predict changes in various task environment sectors (Koberg & Ungson, 1987)
Ability to predict the environment (Smith et al., 1979)
Degree of changeability: Proportion of activities interrupted by unexpected events or routine demands (Hrebiniak, 1974); Degree to which a task is unclear, not understood, tends to stimulate problems, and causes a waste of time (Gresov, 1989); Number of unexpected or novel events that occur in the transformation process (Fry & Slocum, 1984); Number of exceptional cases encountered by case workers (Sharder et al., 1989); Extent to which raw materials and task activities associated with the performance of a particular job are well understood and nonproblematic for individuals in the unit (Comstock & Scott, 1977); Extent to which raw materials and task activities associated with the combination of tasks carried out by an organizational subunit are well understood and nonproblematic for individuals in the unit (Comstock & Scott, 1977); Degree of reliance on routine procedures and the ability to measure up to demands made by routine/nonroutine procedures and their frequencies (Tung, 1979); Extent of having a clearly defined body of knowledge and understandable sequence of steps to be followed (Van de Ven & Delbecq, 1976); Degree of unpredictability of each environmental factor (McDonough & Leifer, 1983); Extent to which the environment of an organization is unpredictable (Singh, 1986); Extent to which environmental factors pose greater uncertainty in decision making and in the attainment of organizational goals (Tung, 1979).

Pace of changeability: Frequency of coming across specific difficult problems that one does not know how to solve and the time investment needed in order to reach a solution (Van de Ven & Delbecq, 1976); Frequency of exceptions during interacting with clients and during the problem-solving process as assessed by line workers (Glisson, 1978); Frequency of changes in manufacturing technology (Tayeb, 1987); Frequency of changes in product technology (Tayeb, 1987); Frequency of introduction of modified products and change in ingredients (Tayeb, 1987); Frequency of introduction of a brand new product or design (Tayeb, 1987); Frequency of changes that required the organization to modify its activities and to adapt itself to changing business conditions during the last few years (Pennings, 1975); Frequency of technological changes (Miller & Droge, 1986); Changing conditions, which constantly give rise to fresh problems and unforeseen requirements that cannot be broken down or distributed automatically (Burns & Stalker, 1961); Amount of change in the number of active customers during three periods and respectively (Pennings, 1975); Growth of sales over five years (Yasai-Ardekani, 1989); Addition of new clients or products per year (Dewar & Hage, 1978); Number of major product changes during the past five years (Keller et al., 1974); Necessity of practical changes (Miller & Droge, 1986); Elasticity of demand and technological innovations (Bourgeois et al., 1978); Change over time (Alexander, 1991); Frequency of changes in each environmental factor over the past year or two (Tung, 1979); Degree of change in the environment (Smith et al., 1979); Extent to which the environment of an organization is rapidly changing (Singh, 1986); Degree to which the environment is changing rapidly, economically, culturally, and technically, expanding to other markets and hard to predict (Khandwalla, 1977); Stability of environmental factors dealt with by the focal unit and the frequency with which new factors are taken into consideration in the decision-making process (Tung, 1979); Relative rate of product and process innovation for the industry in each market (Ghoshal & Nohria, 1989); Change in productivity in the organization’s primary industries (Reimann, 1980); Degree of product change (Harvey, 1968); Rate of new or better operating processes used in the industry and of new products (Khandwalla, 1977); Rate of technical change faced by each firm during 1958-69 (Reimann, 1977); Rate of obsolete products (Miller & Droge, 1986); Evaluation of trends in industry sales over a particular time period (Child, 1975); Average percentage increase/decrease in student enrollment (Koberg, 1987).
of the necessity for checking or working with others” or Marsh and Manari’s (1980) “the extent to which the factory depends on customers and suppliers outside of the parent company.” Others, such as Inkson et al. (1970), Khandwalla (1977), and Negandhi and Reimann (1973), employed variations of Pfeffer and Salancik’s definition, reflecting organizational dependency on environmental factors. Examples of connectedness, on the other hand, can be found in definitions such as “the degree of price competition among manufacturers of similar products” (Negandhi & Reimann, 1973). These and similar definitions (e.g., Fry & Slocum, 1984; Ghoshal & Nohria, 1989; Lincoln et al., 1986; Yasai-Ardekani, 1989) reflect relations among environmental factors.

4. Factor unpredictability. This term relates to the ability of the decision maker to anticipate the behavior of a factor. The unpredictability of a factor arises from its changeability. Changeability, in general, has to do with the nature of change in a relevant factor over time. More specifically, this category consists of three elements: degree, frequency, and consistency of change. Taken together, the three elements affect the ability of decision makers to process information accurately and utilize it in forecasting future events that
are deemed relevant to the organization. Synonyms for changeability that frequently occur in the literature are turbulence, dynamism, and volatility (Burns & Stalker, 1961; Child, 1975; Duncan, 1972; Koberg & Ungson, 1987; Lawrence & Lorsch, 1967; Perrow, 1967; Smith et al., 1979).

Extent of changeability relates to the amount of factor alterations within a given period. Examples are “the amount of change in the number of active customers during three periods and respectively” (Pennings, 1975), “growth of sales over five years” (Yasai-Ardekani, 1989), “the addition of new clients or products per year” (Dewar & Hage, 1978).

Pace of changeability refers to the frequency of alterations in the relevant factor over time. Perrow’s (1967) use of exceptions reflects this aspect of changeability. The larger the number of exceptions during the transformation process, the higher the pace of changeability of the factor. Other examples are Lawrence and Lorsch’s (1967) “frequency of new product introduction in a given industry,” Koberg’s (1987) “average percentage increase/decrease in student enrollment,” and Tayeb’s (1987) “frequency of changes in manufacturing technology, product technology, and the introduction of modified and new products.”

Consistency refers to the extent to which the alterations in each factor follow a pattern that is repeated over time. Following Harvey (1968) and Scott et al. (1978), it is suggested that Woodward’s (1958) “technical” scale reflects the consistency of the factor’s pattern, with unit production representing a high level of uncertainty as it brings about “frequent emergence of problems calling for innovation” (Harvey, 1968: 249), whereas mass manufacturing tends to generate relatively standard problems. Another example is Child’s (1975) operationalization of the degree of variability in a company’s environment, “the presence of changes which … involve important differences from previous conditions.”

AN INDUCTIVE SYNTHESIS AND PROPOSED MODEL

Our analysis so far has enabled us to classify all existing operational definitions of uncertainty according to four categories: number of relevant factors, factor diversity, factor connectedness, and factor unpredictability (which includes degree of change, frequency of change, and consistency of change). These categories correspond partially to existing typologies of environmental uncertainty. Daft (1995) and Duncan (1972), for example, have defined and measured environmental uncertainty according to two dimensions: complexity and dynamism. Number of relevant factors and factor diversity, the categories yielded by our literature review, overlap with complexity, while frequency of change and consistency of change overlap with dynamism. However, other categories yielded by our review and dimensions such as interconnectedness or degree of change are not included in these classifications. Furthermore, these classifications do not relate to uncertainty generated by technology.

The various definitions presented in Table 1 show that researchers tend to operationalize uncertainty in very narrow terms. In other words, in most studies uncertainty has been measured by means of a very small number of factors, or by groups of factors defined a priori. None of the studies adopted a system view of uncertainty; that is, none of them reflected the impact of the overall environmental and/or technological system on the decision makers’ state of uncertainty. This is evident when looking, for instance, at the operational definitions falling under the heading of connectedness. Nearly all the definitions measure the dependence of the organization on certain factors in the environment. The relations between various factors in the organization’s environment and their influence on the decision maker are often completely neglected. In other words, the traditional approach ignores the very complexity highlighted above.
It seems therefore that a system-oriented approach is called for that encompasses aspects of environment and technology and relates to the system in which the decision maker operates as a whole, rather than to specific factors defined \textit{a priori}. The following model applies a system approach to the analysis of the independent variable in the contingency equation. The proposed model can be viewed in term of complex system theory, which views organizations as “fixed entities having variable attributes” that interact to create diverse outcomes (Emirbayer, 1997: 286).

The system approach can be presented figuratively as a matrix with two axes. The first axis, system properties, represents aspects of the system in which the decision maker operates. This axis is divided into four categories: number of relevant factors, factor diversity, factor connectedness, and proportion of unpredictable factors. The second axis, changeability, represents changes in the various system properties over time. This axis is divided into three categories: degree of change, pace of change, and consistency of change. Together, the two axes form a grid with 12 cells, as presented in Figure 2.

\textbf{Fig. 2: A system model of triggers of uncertainty}

\section*{SYSTEM PROPERTIES}

As already noted, the first axis, system properties, consists of four categories describing characteristics of the system in which the decision maker operates at a given time.

\section*{Number of relevant factors}

According to the present model, any definition related to this characteristic must be based on all the relevant factors in the system. As already pointed out, definitions that have been used by researchers in the past have not related to the system but rather focused on a single factor, or at most a few factors, chosen \textit{a priori} by the researcher. We maintain that the organizational structure is the result of the decision maker’s perception of the complexity of the overall system, rather than any single factor. Change in the organizational structure will depend on the amount of perceived change in the complexity of the system. For example, if the number of factors in the system grows, the organization will respond by creating a higher level of differentiation.

It should be noted that we use the term “relevant” to emphasize that the factors in the system are perceived by the decision maker rather than defined objectively by external observers. Thus, factors that may be a source of complexity but are not perceived as such by the decision maker are not included in this category.

\section*{Factor diversity}
This category includes the extent to which the content domain of the relevant factors differs and the extent to which the variables characterizing the factors differ. Our previous analysis showed that existing definitions cover both types of factor diversity.

**Factor connectedness**

This category is defined as the degree to which the factors and the variables characterizing the factors are dependent on each other. By definition, it has meaning only when multiple factors are considered by the decision maker.

While the first category concerns the number of factors with which the decision maker has to deal and the second relates to the differences among them, this third category adds the dimension of interdependence among the factors.

**Proportion of unpredictable factors**

The definitions of unpredictability that have been used by most researchers, as demonstrated above, relate to the ability of decision makers to anticipate the behavior of a single factor. Since a system is usually characterized by more than one factor, the proportion of unpredictable factors at a given time should be considered as a system characteristic. Only one of the definitions appearing in Table 1 resembles this approach, “the proportion of activities interrupted by unexpected events” (Hrebiniak, 1974). Each separate factor’s predictability is dependent, of course, on its changeability (i.e., degree, frequency, and consistency of change), but predictability as a system property is defined as the proportion of unpredictable factors perceived by the decision maker at a given time.

Any change in one or more of the four characteristics may trigger uncertainty. Diversity, connectedness, number of relevant factors, and proportion of unpredictable factors represent the static elements of the system in which the organization operates. On their own, system properties do not cause uncertainty. System properties represent the world with which the decision maker has to cope at a given moment in time, but not the nature of its change. For instance, a system may consist of a great diversity of factors yet be very certain because the nature of the diversity is known. Uncertainty is created only when the extent, pace, or consistency of this diversity evolves over time. The larger the extent of change, the quicker the pace, and the less consistent the changeability, the more uncertain the system.

System properties set the stage on which the organizational structure lies. The more diverse the system, the more differentiated the structure; the higher the level of dependence on given system factors, the sharper the organizational focus on those factors; the more interconnected the system, the higher the structural complexity. These structural responses allow the organization to cope with the properties of the system in which it operates, but do not provide responses to the changeability of those properties.

**CHANGEABILITY**

The second axis, changeability, refers to change in the system properties over time and reflects the system’s instability. When the system properties are characterized by a high degree of changeability, the organization cannot rely on decisions taken in the past or on an organizational structure that fitted a different environmental
context. The inability to rely on existing organizational procedures and systems as well as the need for continual information gathering and change of organizational conceptions are the triggers of uncertainty.

The changeability (or uncertainty) axis represents the dynamic aspects of the system over time and is divided into the same three categories of unpredictability/changeability discussed above; that is, degree of change, pace of change, and consistency of change. Taken together, the three categories of changeability affect the ability of decision makers to process information accurately and utilize it in forecasting future events that are deemed relevant to the organization. It should be noted that uncertainty is created by change in the system as a whole, rather than by change in a single factor. Moreover, system properties result in uncertainty only when combined with changeability. It is the degree of change, pace of change, and consistency of change in the system properties that lead to uncertainty.

ON THE DECISION MAKER’S ROLE IN THE CONTINGENCY EQUATION

From the decision maker’s perspective, uncertainty is not an objective state but rather a state of mind. The same triggers of uncertainty may elicit different levels of confusion or different informational needs in different decision makers. Further, the same objective triggers may be perceived in various ways by different decision makers. Yasai-Ardekani (1989) argues that managerial perceptions of environmental conditions depend not only on the environmental characteristics themselves, but also on the individual characteristics of the managers. Thus, perceived triggers of uncertainty and feelings of uncertainty will be moderated by the decision maker’s cognitive capabilities and personality profile.

Since organizations come to know their environments only via the perceptions of their managers (Weick, 1979), they do not respond to unnoticed events (Miles et al., 1974; see also Child, 1972; Hrebiniak & Joyce, 1985; Meyer & Starbuck, 1992; Mintzberg, 1989). Given individual differences, the same system will be perceived by one decision maker as consisting of a large number of diverse factors and by another as being comprised of a few, relatively similar factors.

Schrader et al. (1993) suggest that decision makers regulate their state of uncertainty by creating different mental models. This approach is echoed in much of the literature on multimethodologies (Mingers & Gill, 1997). Whereas some build elaborate models incorporating a large number of factors, others use relatively simple models that ignore all but a few factors. Lewin and Stephens (1994) suggest an integrated model that describes how individual characteristics including, for instance, need for achievement, locus of control, tolerance of ambiguity, and risk propensity affect organizational design. However, whereas the Lewin and Stephens model suggests that individual characteristics have a direct effect on that design, this article poses that the relationship between individual characteristics and structural responses to uncertainty is moderated by cognitive capabilities. A number of cognitive characteristics are proposed:

- **Cognitive complexity.** Scott (1962: 207) refers to cognitive complexity as the “elaboration of the cognitive component of an attitude—the richness of the ideation content, or the number of ideas a person has about an object.” Cognitive complexity affects how someone thinks about their context of action, which is manifested in the ability to apply different perspectives. The construct has been positively correlated with superior managerial performance as it results in added capacity for problem detection and problem solving (Bartunek et al., 1983; Weick, 1979).
Need for cognition. Cohen et al. (1955: 291) describe the need for cognition as “a need to structure relevant situations in meaningful, integrated ways … to understand and make reasonable the experiential world.” Cacioppo and Petty (1982) and Cacioppo et al. (1984) demonstrate that people high in need for cognition enjoy relatively demanding cognitive tasks, even in the absence of feedback about performance. Subjects who were low in need for cognition were found to “loaf” on a brainstorming group task (Petty et al., 1985).

Sharpening versus leveling. Kelman and Cohler (1959) distinguish between sharpeners, who emphasize unique, distinguishing details, and levelers, who ignore details and seek to simplify their environment. They found, for example, that in a persuasion situation, sharpeners showed greater acceptance of a recommendation communicated to them than did levelers, and that the differences was greater for those with a high need for cognitive clarity. According to Cohen (1964), sharpeners with a high need for clarity should be especially active in processing all information, whereas levelers with a high need for cognitive clarity should be especially observant in order to avoid ambiguity.

The role of the three individual characteristics may be summarized in the following argument: the higher the decision maker’s cognitive complexity, sharpening tendency, and need for cognition, the greater the number of factors considered and the lower the feeling of uncertainty; the higher the decision maker’s cognitive complexity, sharpening tendency, and need for cognition, the more likely factor connectedness is to be considered and the higher the uncertainty.

Need for cognitive closure. Whereas cognitive complexity and need for cognition reflect the individual’s ability to process information and thinking enjoyment, need for closure exemplifies individuals’ desire for knowledge. Kruglanski (1989, 1990; Kruglanski & Webster, 1996) presented a two-dimensional classification of epistemic motivations; that is, motivations to acquire knowledge: closure-seeking versus avoidance, and nonspecificity versus specificity. The need for closure (as opposed to avoidance) reflects the desire for clear, definite, or unambiguous knowledge that will guide perception and action as opposed to the undesirable alternative of ambiguity and confusion. Nonspecific closure refers to definite knowledge on a given topic, irrespective of the particular content of such knowledge, whereas specific closure is knowledge ingrained with some special properties (e.g., optimistic contents, like demonstration of high organizational revenues). The desire for closure is assumed to be related positively to the perceived benefits of closure and the perceived costs of lack of closure, while the desire to avoid closure is assumed to be positively related to the perceived costs of closure and perceived benefits of lack of closure.

High need for closure has two main related effects (Kruglanski & Webster, 1996): seizing and freezing. The seizing effect reflects the tendency of individuals to attain closure as soon as possible, while freezing expresses the individual’s inclination to maintain it for as long as possible. Kruglanski and his associates conducted experimental studies demonstrating the effect of the need for closure on the way people seek and process information prior to forming judgments or making decisions (Ellis, 1996; Freund et al., 1985; Heaton & Kruglanski, 1991; Kruglanski & Freund, 1983).

Finally, the effects of need for closure on one’s perceptions of triggers of uncertainty may be summarized in the following three arguments: the higher the decision maker’s need for closure, the more likely they are to ignore changes in the contextual system and maintain their perception of the system, and the lower the feeling of uncertainty; the higher the decision maker’s need for closure, the lower the feeling of uncertainty and the lesser the need to change structure and/or processes; and a decision maker with a high
FEELINGS OF UNCERTAINTY

Feelings of uncertainty stem from decision makers’ belief that information is insufficient and that it is impossible to pinpoint external events that might influence the organization. Thompson (1967), for example, viewed uncertainty as the result of an inability to understand fully the number and behavior of system variables. Milliken (1987, 1990) added a chronological dimension by distinguishing between state, effect, and response uncertainty.

It is necessary to distinguish between feelings of uncertainty (mostly characterized by the state of mind that one does not have sufficient information to make decisions) and the triggers of uncertainty, which are embedded in the environment and/or technology and filtered by decision makers’ personal characteristics. The distinction between feelings and triggers of uncertainty carries important implications. The correlation between the two is partial at most. While not knowing the probability distributions of relevant decision factors is probably akin to information paucity, the relationship between uncertainty sources and information needs might be mediated or moderated by the personality traits or cognitive characteristics described above. To predict organizational responses to uncertain environments, one should measure not only the decision makers’ perceptions of the environmental or technological cues of uncertainty but also the feelings elicited by these perceived cues. In other words, structural responses may also be mediated by the decision makers’ feeling of uncertainty vis-à-vis the state of the world. Thus, uncertainty triggers do not necessarily have a direct impact on structural adaptations.

To conclude, in terms of the above model, it should be noted that feelings of uncertainty are generated by the perceived changeability of system properties and not by the properties themselves. Whereas organizational actors may adjust to a diverse but stable system, they experience feelings of uncertainty when faced with a system that is changing, especially when the change is rapid, substantial, and inconsistent. In contrast, complex systems per se do not bring about uncertainty unless the number of their component factors, their diversity, or the relationships among them change over time. Hence, feelings of uncertainty are determined by the level of the perceived change of the system.

DECISION MAKERS’ RESPONSES TO UNCERTAINTY:
SYNCHRONIZING STRUCTURE, PROCESS, AND SYSTEM

The role of the decision maker does not end with undirected feelings triggered by the system’s changeability. An equally important role is to be involved in directing organizational responses to the changing environment and technology. Though feelings of uncertainty may motivate decision makers to increase their knowledge about the organizational system and to decide to implement corresponding changes, the particular structure is selected following a careful analysis of the relevant data. Whereas managers are generally capable of reaching sophisticated and effective organizational design decisions, they cannot always implement these decisions. Clearly, structural and process responses are not the only responses to uncertainty (for instance, organizations hedge financial risk), but it is beyond the scope of this article to elaborate on all responses.

The three widely accepted dimensions of structure are centralization, or the degree to which authority and decision-making power are concentrated at the top or distributed throughout the organization (Hage & Aiken, 1969; Pennings, 1973); formalization, namely the degree to which procedures are rigid and codified (Walton,
and specialization, that is, the extent to which work is divided into specialized tasks (Hage & Aiken, 1969; Pennings, 1973, 1975; Reimann, 1977; Walton, 1981).

Other things being equal, the greater the number of factors considered in the decision-making process, the less capable are senior echelons of possessing all the information necessary for effective decision making. For instance, in complex production systems, sufficient authority must be assigned to lower organizational levels (Grimes & Klein, 1973; Hage & Aiken, 1969; Van de Ven & Ferry, 1980). A decentralized structure is particularly effective when the system in which the organization operates is complex and can be segmented into product or market areas (Duncan & Weiss, 1979). The higher the perceived number of factors, the lower the centralization. Decentralization necessitates the establishment of integrating functions. Formal procedures assist in coordinating the responses of organizational subunits to multiple and/or diverse factors. Formalization implies codified, programmed responses that enable simultaneous consideration of a great number of factors (Glisson, 1978), as long as these factors are clearly structured. Hence, the higher the perceived number of (clearly defined) system factors, the more formal the structure.

To handle multiple factors, the organization develops expertise in various domains. As long as these factors are well defined (e.g., when customer groups can be clearly differentiated), organizations can design specialized departments and assign experts to deal with each factor (see Dewar & Hage, 1978; Hage & Aiken, 1969). Thus, the higher the perceived number of factors, the higher the degree of specialization. Similar hypotheses can be phrased in terms of other system properties.

It should be noted that the latter observation is at odds with the traditional contingency hypothesis regarding complexity producing an organic structure (i.e., less specialization). Indeed, the framework proposed here represents a departure from the conventional structural contingency thesis in that it questions organic solutions to high values of system properties. In a further departure from the traditional contingency view, structural dimensions might vary independently of each other.

Decentralization is a rational response to rapid or inconsistent change: As it is difficult for senior management to monitor a rapidly changing environment single-handedly, information is shared (Hage & Aiken, 1969). The situation is different with regard to formalization and specialization. For instance, a highly frequent yet consistent change calls for more rather than less formalization. As long as changes are perceived to be predictable, they can be codified. In fact, the more frequent the changes, the more necessary it becomes to codify them (Hage & Aiken, 1969; Child & Kiesler, 1981; Hickson et al., 1969). Frequent but similar changes may, in principle, be handled by anyone in the organization, but they may also be handled by specialists if so desired (Van de Ven & Ferry, 1980; Child & Mansfield, 1972; Burns & Stalker, 1961). In contrast, highly variable change undermines the feasibility of formal channels (Horvath et al., 1981), rendering strict codification and documentation of employee duties and work procedures impracticable.

Finally, while structural contingency views structural adaptation as the sole response to uncertainty, we argue that other adaptations are available as well. Having a range of options gives the manager and the organization the benefit of requisite variety. In the following pages, structural solutions to feeling of uncertainty are presented.

**FROM INTENTIONS TO ACTIONS: CAN FIT BE ATTAINED?**
THE CONCEPT OF FIT: TIME LAG AND THE MISALIGNMENT PARADOX

Individuals cannot always implement their plans. They either face unexpected situational constraints or need resources, cooperation, or skills that may be lacking (Ajzen & Fishbein, 1980; Liska, 1984). The problem of implementation has been observed for managers as well (Child, 1972, 1997; Child & Loveridge, 1990). Empirical studies suggesting weak relations between attitudes and seemingly relevant behaviors began to appear in the 1930s (e.g., Kutner et al., 1952; Lapier, 1934). While early warnings regarding these relations fell on deaf ears, the problem is now widely acknowledged. Fishbein (1967) and Fishbein and Ajzen (1975) suggested that the proximal cause of behavior is one’s intention to engage in the behavior. Attitudes influence behavior by their influence on intentions, which are decisions to act in a particular way and, more specifically, an expression of the individual’s motivation in the sense of their conscious plan to exert effort in carrying out the behavior.

While the traditional structural contingency equation assumes that organizations are capable of attaining fit between their environment, or technology, and organizational structure, the expanded structural contingency equation presented in this article begins with a contrasting proposition, namely that a perfect fit between organizations and their environments is unattainable. The reason that perfect fit is unattainable has nothing to do with the gap between aspirations and reality. In this sense, fit is not akin to an ideal type, which cannot be realistically achieved in the real world (Weber, 1947). Rather, fit is unattainable because of the basic sequence of events governing organizational adjustment to changing circumstances. In different terms, the very nature of organizational change as a complex process ensures that fit will not be perfect.

In traditional structural contingency research, both environment/technology and organizational structure were measured at the same point in time, neglecting the time necessary for decision makers to become aware of a change (Hall & Saïas, 1989), make sense of it (Daft & Weick, 1984; Weick, 1996), and eventually implement the strategic decision (Nord & Tucker, 1987). Donaldson (1987) discussed this shortcoming and proposed the “structural adaptation to regain fit (SARFIT)” theory, reflecting a dynamic view of the issue of fit. More particularly, Donaldson’s theory poses a cycle of adaptation: fit, contingency change, misfit, structural adaptation, new fit.

The time lag between the environmental or technological changes and the structural response leads to a misalignment paradox, whereby organizations can never fully adjust to environmental or technological characteristics. Information processing by decision makers results in a strategic choice and a new organizational structure presumably better adjusted to the new system’s demands. However, by the time information processing and decision making have been completed, the system has changed again. Thus, even when first introduced, the newly adopted structure will already be removed from the demands of the environment or the technology that it was set to meet. Theoretically, perfect fit may be attained between environmental demands and decision makers’ intentions to change organizational structure, but this fit is impaired when decisions regarding structural changes are delayed and cannot be readily implemented. Thus, organizations that want to approximate fit must continuously adjust their processes and fine-tune their structure. This argument contrasts with Lewin and Stephens’ (1994: 187) analogy, whereby design to an organization is akin to what an attitude is to an individual: “a relatively enduring property that is fairly stable across time and situation.” Furthermore, organizational processes change faster than structure, therefore organizational complexity is increased due to the mismatch in the timing of such changes.
THE ROLE OF ORGANIZATIONAL LEARNING IN RESOLVING SYSTEMIC MISFIT

Since all decision makers are limited (albeit to different degrees) in the amount of information they can process and be comfortable with, they will seek to reduce uncertainty. To do this, they will intensify the use of organizational responses that will, in their perception, decrease it. The heightened interest in organizational learning exemplifies the decision makers’ need to reduce the uncertainty stemming from system changeability. To adapt quickly, organizations seek to obtain reliable information about events both within and outside organizational boundaries. Such information is key to making strategic choices in order to maximize effectiveness (Brock, 1975; Pack, 1962; Westney & Sakakibara, 1986). Organizations develop capabilities and mechanisms aimed at scanning, gathering, and storing information pertaining to their system, for example establishing scanning units or assigning individuals to boundary-spanning positions (Allen, 1977; Daft & Huber, 1986; Dodgson, 1993; Huber, 1991; Tushman, 1977; Weick, 1996). Other mechanisms include gathering information and ideas from employees at every level (Deming, 1988; Nonaka & Takeuchi, 1995; Walton, 1986) and designing information systems to assist in verifying, sorting, and filtering data that permeate all parts of the organization (Cohen & Levinthal, 1990; Lee et al., 1992).

Organizations also develop mechanisms that allow members to interpret information and share views, attitudes, and data, as a way of making their system more predictable (Carroll, 1995; Levitt & March, 1988; Weick, 1996). New system properties are then defined on the basis of the new knowledge. For instance, the identification of new client groups alters the number of relevant factors, and probably their diversity and connectedness as well. In general, organizational learning leads to the generation of new ideas, alternative solutions, and evaluation of potential outcomes of existing problems as well as new strategic choices (Lee et al., 1992; Walsh & Ungson, 1991). Given accelerating changes in the business environment, it is not surprising that such processes as those noted above are developing fast. When organizational decision makers experience rapid change in relevant factors, information gathering and processing become key strategic tools, facilitating the fast responses necessary for survival and growth (Bennet & O’Brien, 1994). Systematic data gathering, analysis and drawing the right lessons from past experience endow organizations with the capability to adapt to current as well as future changes (Daft & Huber, 1986; Levitt & March, 1988).

Process and structure are obviously related, each facilitating or constraining the other. For instance, when experts are assigned to particular tasks so as to handle factor diversity, processes are established to handle system integration. Similarly, an environmental-scanning process established to make adjustments to rapid change may create expertise that will later support a more specialized structure. This, again, emphasizes the temporal nature of organizational structure as an adaptive response to a changing complex system.

ORGANIZATIONAL LEARNING MECHANISMS AS A SUBSTITUTE FOR STRUCTURAL CHANGE

Structural changes are time consuming and are often accompanied by changes in ownership and control, employment structure, market focus, technological orientation, and so forth (Useem & Kochan, 1992). To lay the groundwork for structural change and fine-tune the change following its implementation, flexibility is provided by organizational processes. In principle, every structural response (specialization, formalization, or centralization) can be modified by utilizing appropriate processes, which moderate the structural response to system changeability. Quality circles (Deming, 1988; Wood, 1987) or brainstorming camps (Nonaka & Takeuchi, 1995), for example, are intra-organizational processes used to reduce formality. Formality may also
be reduced via nonscheduled meetings (Pennings, 1975) or by transforming organizational culture (Schein, 1992). An inconsistent, changing environment forces employee rotation across and beyond designated positions, reducing the value of specialization (Virany et al., 1992). In other words, the probability decreases of matching tasks against areas of expertise. Similarly, the problems of centralized organizations might be assisted by delegating authority and empowerment (Conger & Kanungo, 1988; Spreitzer, 1995) or via participation (Kerr & Jermier, 1978).

In sum, while structural contingency generally assumes a structural response, turbulent environments call for the concomitant use of organizational processes. Frequent structural changes are not easy to plan and implement, and processes such as scanning permit ongoing adjustment between changes. Structural change will take place only when decision makers are confident that system properties have changed in a way that demands a more permanent response.

**CONCLUSION**

This article expands structural contingency theory while challenging its key assumptions; that is, that uncertainty is generated by system properties and that structural responses, isomorphic across dimensions, represent the only form of organizational adaptation to uncertainty. The proposed dynamic system model posits feelings of uncertainty—generated by system change rather than its stable properties—as the independent variable in the contingency equation, embedded as it may be in organizational environment or technology. This model is reflective of a complex systems approach. In contrast to traditional approaches, it is argued that the feeling of uncertainty is actually the independent variable of the contingency theory. This feeling is a response to individuals’ perceptions of triggers of uncertainty that are embedded in the organizational environment or technology. Furthermore, according to the proposed complex system approach, the feeling of uncertainty is generated by the system’s changeability and not by its stable properties.

The model stresses the role of individuals in structural choice. It is emphasized that people within organizations make organizational changes, and that there is a great difference between decisions about structure and the implementation of structural changes. Individuals exercise some control over their own decisions but cannot control the implementation of these within organizations, since implementation is dependent on other forces. This is a key reason behind the lack of fit between the feeling of uncertainty and organizational structure. Furthermore, since individuals are the organizational sensemakers as well as the decision makers, their cognitive characteristics and motivation to learn affect the way they make sense of the system and intend to respond. In a turbulent environment, fit can be obtained at most between feelings of uncertainty and decision makers’ intentions or plans to restructure their organizations or implement various learning mechanisms. This places the decision makers’ characteristics profile in a central position in the expanded contingency model.

The proposed model attempts to explain the continuous misalignment existing between feelings of uncertainty and organizational structure. It is argued that organizations, as complex systems, will not attain a perfect fit between structure and system. The pursuit of this elusive fit involves a search for structural and/or process solutions. Since structural change tends to disrupt the daily workings of the organization, it is seldom used unless a significant contribution to organizational effectiveness appears to be within reach (Miller, 1987). In the interim, processes are used to finetune the existing structure. While both structure and process constitute responses to system properties, only intra-organizational processes constitute a response to system changeability. In other words, organizational processes allow a response to the ongoing changes in the system.

The structural contingency model presented in this article provides a comprehensive framework within which the relationship between contextual system, uncertainty, and organizational structure evolves. The proposed model is more complicated than the oversimplified contingency equation currently in use, and as such may be
less intuitively appealing to researchers. The model provides, however, for a more realistic depiction of uncertainty as a key organizational input that generates structural and procedural responses, and may be capable of explaining the inconsistent findings obtained for the contingency model in its traditional form.

While more comprehensive than the model it seeks to replace, the proposed model is not intended to cover the entire spectrum of organizational design issues. For instance, the model assumes but does not elaborate on the bargaining and coalition building among organizational members (Child & Loveridge, 1990; Cyert & March, 1960), who differ not only in their interpretation and tolerance of the uncertainty that their units face but also in their sectoral interests, corporate (e.g., belief in decentralized structures) and national culture (e.g., uncertainty avoidance, as in Hofstede, 1980), or cognitive features (e.g., parties who are intolerant of ambiguity will agree on strict formality). Nor does the model encompass issues relating to “environmental management” (Child, 1995; Galbraith, 1977), which suggests that organizations can manipulate their environments in an effort to, say, reduce the number of factors with which they deal (e.g., reducing the number of suppliers, moving into a less competitive domain) or buffer themselves from their system via such strategies as leveraging legitimacy. This kind of issue will have to be considered and incorporated in a future, further expanded contingency model that could also examine the question of organizational structures often having more to do with institutional pressures than with work demands (Meyer & Rowan, 1978). So, when a given structure is ideologically prescribed, as in Communist China or in kibbutz factories in Israel, it is used as a pretext to avoid structural change, regardless of system requirements (e.g., Shenkar, 1984).

In its expanded form, structural contingency can serve as a crucial bridge between macro and micro approaches to organizational theory and behavior, linking environmental, structural, and behavioral elements within a unifying framework. As such, the complex system approach contributes to the expanded view of structural contingency presented in this article. For example, the organizational learning literature presumes that learning is a necessary organizational response to the rapidly changing and hypercompetitive business environment, and that organizations must have the capability to adapt to current as well as to future changes by practicing procedures aimed at gathering, analyzing, restoring, and retrieving knowledge (Dodgson, 1993; Huber, 1991; Levitt & March, 1988). This ability, from a structural contingency perspective, has to do with the concordance between the system and the organizational structure and processes. Organizational learning may be a key process facilitating adjustments, but, ironically, it is also an impediment in the case of rapid change, when learning procedures prelock the organization into existing patterns.

Almost 40 years following its emergence via empirical discovery (see Woodward, 1958), structural contingency theory is now in a position to resurface as a powerful theoretical and analytical tool, whose implications for the real world of business should not be lost. With the acknowledgment of the important role of individuals in the structural choice, with a new “structure” (e.g., a more comprehensive equation), and with the incorporation of appropriate processes (e.g., organizational learning), structural contingency may have what it takes to compete in what has become a rapidly changing world of organizational theories.

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