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ENVIRONMENTAL SELECTION AND ORGANIZATIONAL STRUCTURING: STEPS TOWARD A THEORY OF INERTIA AND ADAPTATION IN ORGANIZATIONS

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Abstract

Empirical studies have found support for both inertia and adaptation in organizations. This paper provides a set of boundary conditions for explaining both organizational inertia and adaptation in organizational structures. We derive a set of testable proposition on (1) how the frequency and variability of environmental change affects the long-run survival advantages of structurally inert versus structurally transformable structure and (2) how under conditions of coercive environments, organizational slack and the costs of change affect inertia and adaptation of organizations. In the case of ambiguity, economic, political, and cultural factors all affect organizational structuring and the determinants of inertia, change, and adaptability.
One of the principal unsolved problems in organization theory is the determination of inertia, change, and adaptation. The population ecologists (Hannan and Freeman, 1977, 1984, 1989) have successfully challenged the once-dominant view that organizations continually adapt themselves to their environment (Lawrence and Lorsch, 1967; Thompson, 1967) and have established the concept of organizational inertia as a common characteristic of organizations. According to the population ecologists, (Hannan and Freeman, 1984, 1989), organizations are relatively inert: organizational changes in its core features occur at a much lower rate than the corresponding changes in the environment. In the theory, structural inertia is a consequence of selection pressures, rather than a precondition (Hannan and Freeman, 1984). Environmental conditions are assumed to favor accountability and reliability of performance in organizations. Hannan and Freeman argue that these characteristics require high reproducibility of structures and that high reproducibility leads to structural inertia.

This selection perspective contrasts with adaptationists’ views, which have historically dominated organization theory (Astley and Van de Ven, 1983). According to this perspective, organizations adapt to their environment to ensure their continuing performance and survival. Adaptationists’ views do not belong to one coherent research program but include proponents of contingency theory (Lawrence and Lorsch, 1967; Lawrence and Dyer, 1983), resource dependence theory (Pfeffer and Salancik, 1978), evolutionary economics (Nelson and Winter, 1982; Winter, 1990), institutional theory (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Scott, 1987a), organizational learning (March and Olsen, 1976; March, 1981; Levitt and March, 1988) and transformational approaches (Tushman and Romanelli, 1985).

Early work in population ecology concentrated on the founding, mortality and density-dependent processes of organizational populations and did not directly test the assumptions of organizational inertia. More recent empirical attempts to study whether inertial or adaptive forces predominate support the view that both processes are at work. Singh, House and Tucker’s (1986) study of voluntary social service organizations in Toronto did not find support for that either extreme ecological views that all organizational changes increase mortality or
extreme adaptationists' views that all changes increase the rate of survival. Baum's (1990) study of day care centers found that rates of change did not decrease with age but varied by the type of change. His result was not strictly consistent with either the adaptation or inertia model, but that rates of strategic transition were sensitive to environmental changes and organizational performance conditions, as hypothesized by adaptationists' theories. Amburgey, Kelly and Barnett's (1993) study of organizational change and mortality in Finnish newspapers found that change decreases with age as predicted by ecological models, but that organizational change reduces mortality in the long run, as predicted by adaptationists' views. Haveman's (1993) study of restructuring in the U.S. savings and loan industry found that, under conditions of environmental upheaval most organizational changes enhanced financial performance and diminished failure rates. Zajac and Kraatz (1993) arguing from an adaptationist perspective, found that U.S. universities adapted to environmental conditions by restructuring their academic offerings. Despite these conflicting findings, no adequate unified theory exists that explains the empirical findings for both adaptation and inertia, or the conditions under which one or the other is likely to predominate.

Overview and Objectives

The objective of this paper is to offer some initial explorations on the conditions governing inertia, change, and adaptation in organizations. We will argue that two distinct, yet interacting, processes are at work in determining inertia and adaptation -- organizational structuring and environmental selection. A general theory of organizational inertia and adaptation requires an examination of both processes. Two separate questions that characterize the debate on inertia versus change in organizations will be explored. First, we will examine the conditions under which long-run environmental selection favors structurally inert organizations relative to organizations that are better able to transform their structures. Second, we will examine whether and when organizations are stable or change in response to short-run environmental shocks. These questions will be applied to an examination of core and peripheral changes in the formal structures of organizations.
In answering the first question, we will reexamine Hannan and Freeman’s (1984) evolutionary theory of structural inertia and modify the theory to determine how different rates of environmental change affect the survival prospects of organizations. The theory helps explain how long-run environmental characteristics favor some forms of organizational structures over others. This form of theory looks at how long-run changes in the flow of resources, information, and technologies in the environment affect the survival prospects of alternative organizational forms. We will examine two environmental characteristics, variability and frequency of environmental change, and link them to the reproducibility or flexibility or core and peripheral structures in organizations. While Hannan and Freeman argue, as a general principle (at least in modern societies) that environmental selection favors highly reproducible structures and organizational forms that are structurally inert, we will argue that these results only apply for environments with low variability and frequency of change. For other environmental characteristics, alternative organizational structures will have higher prospects for survival.

While the evolutionary theory examines the effects of long run rates of environmental change, much interest on inertia, change, and adaptability deals with a separate question -- how organizations respond to discrete environmental events or short-run changes in environmental states. To address this complex process, this paper will highlight the special case of coercive environments, in which environmental forces predominate. We will present a set of propositions on how coercive environments shape organizational inertia, change, and adaptation. Finally we will argue that the emphasis on effects of environmental selection, while illustrative, fails to explain adequately the change in structures of most complex organizations, in the general case when environments are not fully coercive. Contrary to theories that posit external control, complex organizations are autonomous collective actors whose structure and behavior follow an internal dynamic that is influenced but not typically predetermined by the environment.
ORGANIZATIONAL ADAPTATION, INERTIA, AND THE REPRODUCTION AND TRANSFORMATION OF STRUCTURES

A theory of organizational inertia and adaptation must adequately distinguish between organizational stability and change — the reproduction and transformation of structures (Giddens, 1979, 1984) — and their adaptive and non-adaptive consequences. Not all organizational change is adaptive in its consequences. Not all organizational stability will lead to lower levels of performance and to decreased chances for survival (Hannan and Freeman, 1984). Although organizations may transform their structures as a response to perceived environmental demands, organizational performance may deteriorate rather than improve. Changes in the environment may be unrelated to organizational actions and no change may be desired.

A theory of organizational stability and change is a theory of the reproduction and transformation of organizational structures, both formal and informal. Understanding the process of inertia and adaptation entails understanding: (1) the conditions under which organizations reproduce or transform their structures in response to changes in the environment and, (2) the conditions under which the reproduction or transformation of structures has adaptive consequences. This relationship is shown in Table 1.

In the Quadrant I, the case of non-adaptive stability, we find the conditions most commonly equated with organizational inertia. Organizations do not change their structures and this leads to decreased performance and survival chances. In Quadrant II, adaptive stability, organizations do not change and this leads to increased survival opportunities. In Quadrant III, non-adaptive change, the organization changes its structure, but the changes do not lead to improved performance. This could result from a loss in reliability and or accountability when no change was called for. Alternatively, and more commonly, the changes undertaken may be either insufficient or unresponsive to environmental demands. Under these conditions, organizations may be considered to be relatively inert — organizations change their structures but not in a way
that satisfies the changes in the environment. In Quadrant IV, adaptive change, organizational change and adaptation coincide. Organizations transform their structures and these changes lead to improved performance and survival opportunities.

The conditions of Quadrant IV are most closely identified with most treatments of adaptation in the organizational literature. But we must distinguish between intentional adaptation (Hrebiniak and Joyce, 1985) and the adaptive consequences of that behavior (Singh, House, and Tucker, 1986). Intentional adaptation is a socially constructed, subjectively meaningful interpretation of organizational action that emerges through the interplay of both internal and external economic, political, and cultural forces in the process of organizational structuring. Organizations, like other social systems, reproduce and/or transform their structures (Giddens, 1979, 1984) in a recursive process in which structure is both the medium and the outcome. The reproduction or transformation of structures becomes itself structured through reflexive self-regulation. Organizations, like other social systems are capable of gaining knowledge of the mechanisms of system reproduction and employing that knowledge to control the process (Giddens, 1984). In particular, organizations gain knowledge of how the environment affects the organization's performance. Organizations reflexively monitor their actions and employ their knowledge to adapt intentionally to their environment.

Intentional adaptation does not, however, necessarily have adaptive consequences (Quadrant III) and not all adaptive change is necessarily intentionally adaptive. Organizational changes may result from autonomous processes (Burgelman, 1988) that are to a large extent based on retrospective, not prospective rationality (Weick, 1979). And as Kanter (1988) has noted, organizational members have strong cultural and political incentives to characterize organizational innovations as successful, rather than as failures. In a pilot study of organizational innovations, she found very few, if any, organizational innovations that were socially interpreted as failures. Instead, organizational members downplayed and reduced the original goals of the innovations, and often reinterpreted innovations as successful in meeting the new reduced expectations. Other failed innovations were quickly forgotten and disappeared from
organizational memory. The concept of intentional adaptation, while common in the organizational literature, is at best problematic, and not useful for explaining when organizational change takes place or when it is adaptive. Consequently, our subsequent analysis will focus on the adaptive consequences of organizational behavior, independent from its intentionality.

**THE EVOLUTIONARY THEORY OF STRUCTURAL INERTIA: LONG-RUN SELECTION UNDER ALTERNATIVE RATES OF ENVIRONMENTAL CHANGE**

The evolutionary theory of structural inertia addresses the first of two different questions on the on-going theoretical debate -- how long-run selection pressures affects organizational inertia and adaptability. Hannan and Freeman's formulation of the theory (1984) examines the survival advantages of organizations with highly inert structures. Most discussions of organizational inertia and adaptation have focused on the first and fourth quadrants non-adaptive stability and adaptive change, and do not explicitly consider the possibility of organizational actions in the second and third quadrants, adaptive stability and non-adaptive change. Hannan and Freeman's theory is an influential exception. They argued that in modern societies, selection in populations of organizations favors forms with high reliability of performance and accountability, which in turn requires organizational structures that are highly reproducible. Furthermore, highly reproducible structures generate structural inertia. Consequently, selection pressures within populations favor structurally inert organizations.

Hannan and Freeman's (1984) formulation, while an important reminder that organizational change is not always adaptive, suffers from critical conceptual flaws. They correctly argue that selection favors organizations that reproduce their structures when stable outcomes are called for over those that change indiscriminately. They fail to recognize, however, that selection favors organizations that can correctly distinguish between random environmental changes that require no response, and changes in environmental demands that if ignored would reduce performance and survival opportunities. As Scott (1987b) has noted, Hannan and Freeman (1984) implicitly assume that organizational learning fails to take place. Their
assumption that reliability and accountability of outcomes require that organizational structures be highly reproducible is not, in general, correct.

In this section we reexamine the evolutionary theory of inertia and suggest some modifications to its scope and applicability. This section examines how different long-run characteristics of the environment affect the differential survival prospects of highly flexible versus highly reproducible structures. The differential evolutionary prospects of different organizational forms operate over the very long run -- evolutionary selection processes are relatively slow and inefficient (Nelson and Winter, 1982). The modified theory draws the first assumption directly from Hannan and Freeman (1984), which highlights the impact of institutionalized norms (Meyer and Rowan, 1977) of reliability of performance and accountability on the evolutionary survival prospects of organizations.

Assumption 1. Selection in populations of organizations in modern societies favors organizational forms with high reliability of performance and high levels of accountability

In Hannan and Freeman's formulation, reliability of performance and accountability is equated with high reproducibility of structures. But reliability and accountability require that organizational structures be highly reproducible when no change is necessary (Quadrant II) and highly flexible when structural inertia decreases performance (Quadrant IV). Even if we were to accept the implicit assumption that organizations cannot learn to distinguish adequately between situations in which the reproduction of structures is preferable to their transformation, it is still not correct to assume that reliability of performance and high levels of accountability always require highly reproducible structures. If no learning is possible, organizations with highly reproducible structures will fall in Quadrants I and II, versus organizations with more flexible structures, which would fall under Quadrants III and IV. The two types of organizations would make mistakes in Quadrants I and III, respectively. Their relative reliability of performance and accountability would depend on the relative likelihood of errors in Quadrant I versus errors in Quadrant III, a condition that would depend on characteristics of the environment.
Effects of Frequency and Variability of Environmental Change

Hannan and Freeman (1977, 1989) have introduced two environmental characteristics -- level of environmental variability and frequency of environmental change or grain (i.e., coarse versus fine-grained) -- that help us distinguish the survival prospects of highly flexible versus highly reproducible structures. Environmental variability refers to the variance of environmental elements around its mean (Hannan and Freeman, 1989). Grain refers to the pattern and frequency of change. When environmental variations are very frequent, the environment is characterized as fine-grained. When environmental variations are relatively infrequent, the environment is characterized as coarse-grained.

We follow Hannan and Freeman in defining reproducibility of structures as the ability of organizations to enact and replicate existing organizational routines. Traditional bureaucracies (Weber, 1978) serve as an archetype for organizations with highly reproducible structures. Hannan and Freeman’s theory can be reinterpreted as a restatement of the survival advantages of bureaucratic forms under conditions of stable environments. In modern societies, hierarchic, bureaucratic forms may be more likely to survive due to the reliability of performance accrued from standardization and routinization, as well as from the increased accountability associated with decreased particularism and increased formalization (Weber, 1978, Perrow, 1986). Bureaucratic forms are structurally inert (Merton, 1957, Crozier, 1964) and while this may be advantageous in relatively stable environments, rapidly changing environments may limit their survival prospects (Burns and Stalker, 1961).

We define highly flexible organizational structures as those characterized by low levels of routinization and standardization, and high variability in the structural outcomes. The resources, rules, and structural relationships in highly flexible structures are subject to relatively high levels of variability and low levels of reproducibility. Cohen, March, and Olsen (1972) provide a prototype of an extreme form of highly flexible organizational structures -- the organized anarchy. Organized anarchies are characterized by large temporal variability in the organizational structures and routines, as the organizations, problem, solutions, participants, and choice
opportunities are very loosely coupled. In organized anarchies, the particular structural outcomes are dependent on the highly contingent temporal sorting of organizational problems, solutions, and contingencies and the structure of participation and decision-making. The reproducibility of structures in organized anarchies is very low, as the myriad temporal contingencies will have large effects on organizational structures and outcomes.

Hannan and Freeman (1977, 1989) previously applied environmental variability and grain to evaluate the selection prospects of specialists versus generalists. Their analysis assumed that organizational structures were highly inert. We can also use these environmental conditions to evaluate the survival prospects of highly reproducible versus highly flexible organizations if we relax the assumption of structural inertia. The simplest case is that of environments with stable demands, were Quadrant III errors are more likely, and Hannan and Freeman’s conclusions hold. Note that in the case of perfectly stable environments grain is undefined. Similar conclusions can be reached in environments with relatively low variability and low frequency of change, where given that environmental changes are small and infrequent, Quadrant III errors of non-adaptive change are more likely than Quadrant I errors of non-adaptive stability, so that highly reproducible structures are favored.

Assumption 2a. *In relatively stable environments with low variability and frequency of change, selection pressures for reliability and accountability favor highly reproducible structures*

In rapidly changing environments with large variability and large frequency of change, Quadrant I errors (non-adaptive stability) will be greater than Quadrant III errors (non-adaptive change) and will lead inert organizations to lower reliability of performance. In the case of highly variable, fine-grained environments, the survival advantage of high reproducibility of structures is limited, as the frequency of environmental change equates reliability of performance with adaptability to repeatedly changing circumstances, rather than to the reproducibility of organizational structures and routines. Selection pressures favor organizational forms whose
structures are highly flexible and adaptable to high variability, high frequency environmental change.

Environments with high frequency and variability of change are characterized by a constant stream of competence-destroying innovations with limited opportunities for standardized organizational routines to take hold. In such environments long run organizational survival is predicated in the ability to rapidly adjust to changes in products, technologies, competition, financial arrangements, government regulations, and professional and occupational standards. While extreme forms of environmental instability are most likely untenable over the long run, relatively high levels of frequency and variability of environmental change may be observed in such contemporary environments as biotechnology and film production. Network or hybrid organizational forms with flexible specialization provide an example of organizational arrangements with relatively low levels of reproducibility of structures and high levels of flexibility (Piore and Sable, 1984; Powell, 1990, Baker and Faulkner, 1991). Network or hybrid forms are more likely to survive when environments are highly variable and change is very frequent. In biotechnology, network forms (Powell, 1987) provide highly flexible forms where a myriad of interorganizational arrangements provide firms with the capacity to tap rapidly into changing technologies, information, market, and production arrangements. In film production, the high frequency and variability of product, competitive, and market innovations that have characterized the blockbuster era marked the demise of studio forms of film production and the rise of flexible specialization and network forms (Christopherson and Storper, 1989; Baker and Faulkner, 1991). Concrete social structures in Hollywood film production are highly plastic and idiosyncratic, as they are specifically constituted for each individual film. Hollywood film production is an organized anarchy with very low levels of reproducibility of structures, highly levels of adaptability and imitation, and economic performance superior to bureaucratized forms of studio production. (Baker and Faulkner, 1991)
Assumption 2b. *In environments with high variability and high frequency of environmental change, selection pressures for reliability and accountability favor highly flexible structures.*

Environmental variability and grain can vary independently (Hannan and Freeman, 1989). Environments with low variability of change, but high frequency (fine grained) are characterized by environmental demands for continuous incremental change. Organizational forms that allow for rapid incremental changes but prevent large scale organizational transformations from taking place are more likely to increase their survival chances than either organizational forms whose highly reproducible structures inhibit incremental change or forms whose flexibility allows for larger variations in their structures. High levels of reproducibility in the core features of the organization (Hannan and Freeman, 1984) -- its mission, basic authority systems, core technology, and marketing strategy --coupled with high levels of flexibility in its peripheral features allow for high frequency, low variability changes to take place. An example of this form of organization is the team-based, “lean production” system at Toyota and NUMMI (Cusumano, 1984; Adler, 1993). The core features of Toyota and NUMMI are deeply embedded in the lean production paradigm and are continually reproduced. This structural form allows for continuous, incremental change and learning in the peripheral structures and organizational routines while maintaining the core mission, authority structure, technological system, and marketing strategies intact (Adler, 1993).

Assumption 2c: *In environments with high frequency and low variability of change, selection pressures for reliability and accountability favor organizational forms with highly reproducible core structures and highly flexible peripheral structures.*

In environments with high variability but low frequency of change, the core-periphery distinction in the reproducibility of structures fails to allow for high variability, but low frequency environmental changes to take place. High variability of environmental change may favor changes in core features and structures of the organization. Haveman’s (1993) study of the effects of high variability, punctuational (i.e., low frequency) environmental change on
organizational change in the savings and loan industry provides an example of such circumstances. Haveman found that savings and loans facing large punctuational changes improved their short-run performance and for the most part, their long run survival prospects, if they undertook changes in their core strategies. While Haveman did not evaluate the decomposability of organizational change in the savings and loan industry, we would hypothesize that changes in strategy and domain were organized through new organizational subunits separate from other divisions of the organization.

In environments with high variability, but low frequency of change, Quadrant I errors will be more likely if the organizations fail to respond to large changes when they occur. The large variability of change favors organizational forms that are able to adapt to large changes in the environment including, when necessary, changes in the core structures of the organization. At the same time, coarse-grained environments with low frequency of change favor organizational forms that are not constantly changing. Because of the low frequency of change, these environments favor organizations that produce the benefits of reliability and accountability provided by the reproducibility in their peripheral structures, while allowing high variability in the core structures.

Highly decomposable organizations have the desirable property of permitting changes in the core features of the organization through the addition, deletion, and combination of independent organizational subunits while maintaining stable structures within the individual subunits. Simon (1962) defines highly decomposable organizations as organizational forms characterized by a high degree of linkages and interactions within organizational subunits and a low level of interactions and linkages between them. The core features of a decomposable organization- its mission, authority system, technological system, and marketing strategy- (Hannan and Freeman, 1984) may vary significantly between subunits, with substantial uniformity and stability in the core within the subunit. Highly decomposable organizations are able to adapt to high variability environmental change through an intraorganizational ecology of
variation, selection, and retention of individual decomposable subunits (Burgelman, 1991; Miner, 1991).

The multidivisional form (Chandler, 1962: Williamson, 1975) is a special case of a highly decomposable organizational form whose organizational subunits are highly independent of each other. It allows significant differences in the core structures of the organization’s divisions or subunits. Multidivisional organizations can adapt to large variations in organizational environments by adding or subtracting divisions or subunits without altering the core features of the remaining divisions. Stinchcombe (1990) has identified the innovative advantages of the multidivisional form as the ability to respond to large variations in the environment, such as in the case of Schumpeterian, or competence-destroying innovations (Tushman and Anderson, 1986). Multidivisional firms respond to competence destroying innovations by introducing new autonomous divisions to manage large scale product and technological changes. Furthermore, the multidivisional structure allows the subunits to routinize their procedures and to develop highly reliable, highly reproducible structures when the subunit has adapted to its particular niche and the niche dynamics become increasingly stable. Consequently, the multidivisional form provides an example of highly decomposable organizations, able to change their core features through the addition, deletion, or recombination of subunits, but with highly reproducible subunits that produce high levels of reliability and accountability in coarse-grained environments.

Assumption 2d: In environments with low frequency and high variability of change, selection pressures based on reliability of performance favor decomposable organizational structures with highly reproducible subunits.

The effects of frequency (grain) and variability of environmental change on the differential survival rates of various organizational forms are summarized in Table 2. These differential survival prospects for the different organizational forms operate over the long run as environmental selection pressures take hold. According to this analysis, Hannan and Freeman’s
theory that selection favors organizations that are highly reproducible in their core features only applies when environmental change is of low variability. Unitary-form bureaucracies and team-based organizations are two examples of organizational forms with highly reproducible core structures (with highly flexible peripheral structures in the latter case). But when environments have high temporal variability, highly reproducible structures will not result in higher reliability of performance and accountability but will be dominated by organizational forms that can transform their core structures to adapt to high variability of environmental change. Two forms of organizations allow for high variability in core features. Fine-grained environments with high variability favor hybrid or network forms and organized anarchies that allow for high flexibility in both the core and peripheral features. Coarse-grained environments with high variability favor highly decomposable organizations with highly reproducible subunits, for example, the case of the multidivisional form.

Table 2 presents a contingency relationship between variability and frequency of environmental change and differential survival prospects of organizations with either high flexibility or high reproducibility in both their core and peripheral features. Several caveats and qualifications are in order in interpreting these contingency relationships. First, environmental selection processes operate over the long run and are highly inefficient (Nelson and Winter, 1982; March and Olsen, 1989) so that the assumptions and propositions cannot be used to draw cross sectional inferences. Second, the environmental selection process implicitly assumes that environmental change is exogenous. While this is a useful assumption as a first approximation, environments coevolve with organizations so that organizational characteristics help create the environmental characteristics most favorable for their selection. For example organizations with highly flexible core features and highly peripheral structures are likely to promote high frequency, low variability forms of organizational change. While allowing for coevolution complicates the causal relationships, the contingency relationships are not altered. Finally, performance and accountability are multidimensional and must take into account the variability and frequency of change in institutional features of the environment (Meyer and Rowan, 1978;
DiMaggio and Powell, 1983). If measures of performance are highly reliable and unambiguous, technical and economic characteristics of the environment are most likely to affect the dimensions of variability and frequency of environmental change. If performance measures are highly ambiguous and contested, institutional characteristics are more likely to be critical to specifying the dimensions of environmental change. In such circumstances the variability and frequency of environmental change will be conditional on the variability and frequency of change in the institutionalized myths and isomorphic pressures in the environment.

Accountability requires that organizations respond to institutionalized changes in the environment by corresponding changes in organizational structures. Pressures for mimetic isomorphism, in particular, may be associated with environmental demands for high frequency or variability of change (Haveman, 1993; Mezias and Lant, 1994).

**Reproducibility, Structural Inertia, and Transformability**

Organizational characteristics that lead to highly reproducible structures generate corresponding tendencies for structurally inertia (Hannan and Freeman, 1984). Conversely, organizational characteristics that lead to structural flexibility generate corresponding tendencies for structural transformability. Organizational structures are continually reproduced and transformed in action (Giddens, 1984). Structural properties that lead to high reproducibility of structure include high levels of standardization, formalization, cultural consensus, and centralization of decision-making. These structural properties, characteristic of organizational bureaucracies (Weber, 1978) lead to rigidity in the application of rules and in organizational relationships which constrain responses to organizational change (Merton, 1957; Crozier, 1964). High levels of reproducibility in either core or peripheral structures generate structural inertia in the corresponding organizational structures.

**Assumption 3a:** High levels of reproducibility of structures generate strong inertial pressures.

While traditional theories of bureaucracy describe conditions that lead to high reproducibility and structural inertia, contingency theories (Burns and Stalker, 1961; Lawrence
and Lorsch, 1967, Perrow, 1971) show that other organizational forms allow for greater variability and flexibility in organizational structures and outcomes. Departures from standardization, formalization, cultural consensus, and centralization of decision-making all constrain the reproducibility of structures and lead to greater variability of structures and outcomes. Flexibility of organizational structures, whether in the core or the periphery of the organization, will lead to increased rates of structural change. Under conditions of environmental change, high levels of structural flexibility will generate strong pressures for transformation in the organizational rules, resources, and relationships which constitute the structure of the organization.

Assumption 3b: Under conditions of environmental change, high levels of flexibility of structures generate pressures for structural transformation.

We will combine Assumptions 1, 2, and 3 to generate a set of theorems on how environmental selection favors different rates of and conditions for inertia and transformability, under different conditions of frequency and variability of environmental change.

Theorem 1a: In modern societies, selection pressures in environments with low variability and low frequency of environmental change favor organizations whose structures have high inertia.

Theorem 1b: In modern societies, selection pressures in environments with high variability and high frequency of environmental change favor organizations whose structures have high levels of transformability.

Theorem 1c: In modern societies, selection pressures in environments with low variability and high frequency of environmental change favor organizations whose core structures have high inertia, and whose peripheral structures are highly transformable.

Theorem 1d: In modern societies, selection pressures in environments with high variability and low frequency of environmental change favor highly decomposable organizations whose subunit structures have high inertia, but with high transformability through variation, selection, and retention of subunits.
Theorems 1a-d provide a set of boundary conditions for the applicability of Hannan and Freeman's (1984) evolutionary theory of structural inertia. Selection pressures favor different varieties of adaptability of organizational forms depending on the frequency and variability of organizational change. Hannan and Freeman's theory is most applicable in relatively stable environments, and their modification on the reproducibility of core features deals with high frequency of environmental change, but not with increased variability. Decomposable organizational forms adapt to large environmental variability through the intraorganizational ecological selection of organizational subunits. And in environments with high frequency and variability of change, selection pressures favors organizational forms with high variability in their organizational structures and high transformability.

The boundary conditions specified in Theorems 1a-1d provide testable propositions on the long-run survival advantages of organizational stability versus organizational change. The theorems suggest that the results of tests for the applicability of Hannan and Freeman's theory of structurally inertia will differ across different environments. The theorems suggest that as the variability and frequency of environmental change increase, the survival prospects of structurally inert organizations decrease. If we believe that contemporary environments are becoming less stable and that environmental variability is increasing, the selection advantages of traditional, structurally inert bureaucracies may also be decreasing. Note however, that the effects of environmental selection are not fully determinate, as selection forces may take a long-time to occur. Internal determinants of structural inertia will become more important when environmental selection pressures are less strong and determinate.

INERTIA, ADAPTATION, AND CHANGE: ORGANIZATIONAL RESPONSES TO ENVIRONMENTAL EVENTS

Our reformulation of structural inertia theory has focused on inertia as a characteristic of organizations and the general environmental conditions under which inertial organizations are more likely to survive. But the relationship between organizational structuring and environmental consequences posited in Table 1 leads us to ask a second question in the debate --
under what conditions will organizations fail to respond to changes in the environment and under what conditions will these changes be adaptive? These lead us to focus on organizational inertia not as a characteristic of all or certain types of organizational forms, but on inertia as a product of the interaction between environmental situations and the internal dynamics of the organizational structuring process. In characterizing the environment of organizations we will be concerned primarily not on whether environments are stable or frequently changing but on the particular circumstances of environmental change and their effects on organizational structuring and outcomes.

The process of organizational structuring is condition by the organizational enactment of the environment, but is also an outcome of the organization’s existing structure. Organizational inertia and adaptation are jointly determined by environmental influences and by internal organizational processes. The extent to which environmental conditions predominate depends on the coerciveness of the environment in affecting the survival prospects of organizations that do or do not respond to environmental demands. Both technical and institutional environments vary in their degree of coerciveness over the organization and in the extent to which they “determine” (Hrebiniak and Joyce, 1985) inertia and adaptation or stability and change.

**Coercive Environments: A Special Case**

In this section we will explore the special case of completely coercive environments to determine their effects on inertia and adaptation. Perfect competition in product markets is an example of a complete coercive environment in which organizations, in the long run, must meet market demands if they are to survive. Institutional environments can also be completely coercive — for example, strictly enforced legal requirements for organizational forms (DiMaggio and Powell, 1983). Given the complexity of internal organizational processes, it is useful to examine the special case of completely coercive environments to determine whether a more parsimonious theory can explain organizational inertia and adaptation purely as a result of changes in environmental conditions.
Environments can change as a result of a myriad of circumstances: changes in consumer demands, changes in regulations, new technological and organizational innovations, changes in the norms of the organizational field, etc. As environments change, both new organizations that meet the new demands, and organizations that change will have an advantage in competitiveness and/or legitimacy over those that remain stable. If the environment is completely coercive, organizations that do not change to meet the new demands cannot survive. For example, in purely competitive markets, if a new technology that reduces costs is introduced, only firms that adopt the new technology will survive. Alternatively, if the federal government requires contractors to develop a project management structure to receive grants or contracts, only organizations that comply with these requirements will survive in the government contracting business. This leads is to the first assumption in our theoretical development.

**Assumption 4:** *If environments are coercive, selection in populations will limit the survival of organizations to those that change to meet environmental demands.*

We assume that organizations are boundedly rational which, subject to the cognitive limitations on understanding and interpreting their environments (March and Simon, 1958), will act to improve their performance and survival opportunities. If environments are coercive, and organizations are cognizant of the requirements imposed by environmental changes, organizations will attempt to change to survive. Environmental change is often, however, ambiguous — the outcomes of potential organizational changes are highly uncertain. As we will discuss further below, ambiguity about the environment produces difficulty in organizational interpretation, particularly in the short run, and multiple organizational outcomes are possible. To simplify our analysis we will first discuss the case of unambiguous environments. Although no situation is completely transparent and unambiguous, the case of unambiguous environments serves as an ideal type in understanding the process of change.

**Environments without ambiguity**

In unambiguous situations, organizations will attempt to transform their structures to respond to changes in the environment. Yet even in this ideal case, the organization’s financial
and human capabilities limit the capacity for organizational change. Most organizational change is costly -- new technologies may entail fixed capital investments, new strategies and reporting relationships may require training, and new intra- and inter-organizational relationships require both time and financial resources. Furthermore, the organization may have incurred substantial sunk costs in existing assets, both physical and human, yet these devalued assets may still have to be financed. Sunk costs and fiscal barriers to entry and exit limit the organization’s ability to change and adapt to the environment (Hannan and Freeman, 1977), even if the need for change is unambiguous. Only under the extreme conditions of costless change will all existing organizations be able to change and adapt to new environmental situations. The consideration of the costs of change leads us to our second assumption:

**Assumption 5:** If environmental change is unambiguous, and change is costless, organizations will change to meet environmental demands.

The previous example of a project management structural requirement for participation in federal grants and contracts is an example of a requirement that is both unambiguous and relatively costless — organizations can and do change their structures, either temporarily or permanently, to comply with this requirement by a coercive environment.

**Theorem 2:** If environments are coercive, and environmental change is costless and unambiguous, all organizations will change and adapt to their environment.

This theorem follows directly from Assumptions 4 and 5. In the special case of a coercive environment, changes that are costless and unambiguous will result in adaptive change, Quadrant IV behavior, for all organizations. This corollary provides a sufficient set of conditions for adaptationists’ views to apply, and more generally suggests the type of conditions (i.e., low ambiguity, low costs of change) under which these views will be most appropriate, independent of organizational forms.

We now relax the condition of costless change and propose the following assumption:

**Assumption 6:** If environmental change is unambiguous and change (switching) is costly, organizational change will depend on the existence of organizational slack relative to the costs of change.
Cyert and March (1963) define organizational slack as the difference between the total resources of the organization and the total payments required to attract and maintain all organizational participants, including the organization's owners and creditors, managers, and workers. If the costs of switching strategies, technologies, or formal structures are high, organizations with limited slack resources will be at a resource disadvantage. Even if environmental demands are transparent, existing organizations may not have the resources to comply with these demands and at the same time continue to attract organizational participants. If the switching costs are higher than the level of prior organizational slack, organizational change will not be feasible. The greater the amount of organizational slack available before a change in the environment, the greater the ability of an organization to change in response to the environment.

Theorem 3 can now be derived directly from Assumptions 4 and 6:

**Theorem 3**: If environments are coercive and environmental change is unambiguous but costly, organizations with high degrees of slack relative to switching costs will change and adapt to their environment and others will be stable and fail.

The existence of slack provides a buffer to organizations that are faced with meeting costly environmental demands that permits change and adaptation to take place. But if organizational slack is limited, change will likewise be limited and inertia will prevail in the population.

**Corollary 1**: If organizational slack is limited in the population, environments are coercive and change is costly, organizational inertia will prevail in the population.

This corollary presents a set of conditions under which population ecology arguments are mostly likely to be valid, independent of the variability of the environment. Hannan and Freeman (1989) argue that population selection applies principally to the core features of an organization: its authority structure, marketing strategies and core technology. Change in the core features of an organization is relatively costly and is limited by the availability of slack. But organizations with substantial slack are capable of substantial change, even in their core features. The
population ecology approach is therefore more applicable for small and numerous organizations that are limited in their ability to respond to the environment (Scott, 1987).

Consequently, we can derive the following proposition directly from Corollary 1 and Theorem 2, which applies equally to situations where the costs of change are high or low:

**Corollary 2:** If environments are coercive and environmental change is unambiguous, organizations with greater slack will have the same or better survival chances than organizations with less slack.

Daniel Levinthal (1991) reached similar conclusions in a computer simulation model of organizational adaptation and environmental selection. The differential ability of organizations to survive was closely linked to their availability of slack resources. Levinthal also suggests that slack resources may be a function not only of the nature of the environment but of the history of an organization. This leads us to relate the conclusions of Corollary 2 to the liability of newness (Stinchcombe, 1965). Organizational slack is in part cumulative. The relationship between an organization’s age and history and the availability of slack depends on the types of environments that organizations faced in the past. In the case of coercive and unambiguous environments we can expect organizational slack to accumulate and increase with age:

**Assumption 7:** If organizations face environments that are mainly coercive and unambiguous, organizational slack will increase with age.

In the case of unambiguous environments, organizations that survive will likely accumulate more slack and further increase their opportunities for survival. New organizations are likely to have limited slack and will be faced with the liability of newness. We may combine Corollary 2 with Assumption 4 to derive the following proposition:

**Corollary 3:** If organization’s face environments that are mainly coercive and unambiguous, an organization’s probability of survival will increase with age.

As organizations grow older they accumulate slack which further increases their probability of survival. This proposition provides an alternative interpretation to the liability of newness hypothesis proposed by Stinchcombe (1965) and generally found to be valid in empirical test in the population ecology literature (Singh and Lumsden, 1990). The observed
relation between age and survival prospects may reflect the underlying effects of organizational slack upon survival. Given that measures of organizational slack are typically excluded from event-history analysis of organizational mortality, the existing empirical literature on age-dependent mortality or the liability of newness does not serve to test directly our alternative interpretation, and further research is required in this area.

Under the special conditions of a coercive environment, without ambiguity, natural selection and environmental forces may, to a first approximation, provide an explanation of inertia, change and adaptation in organizations. But under more general conditions of environmental ambiguity, ecological arguments will not be sufficient.

**Ambiguity and Organizational Stability and Change**

If we assume unambiguous change, the environment can be readily interpreted and understood by all organizational participants. Introducing ambiguity into the characterization of the environment quickly complicates the analysis. How are environments understood by organizations? Given an organization’s understanding of the environment, how does it respond to environmental change? How do economic constraints on organizational behavior affect organizational responses to the environment? How does the fact that organizations are not unitary actors but are composed of shifting political coalitions of decision makers affect the results? Under what conditions will the organization’s understanding of the environment change? Do the complexities of the organizational structuring matter, or will environmental forces be determinate?

A full answer to these questions is beyond the scope of this paper. We will attempt, however, to provide a few tentative suggestions for parts of the problem. Starting with the last question -- does the internal structuring process affect outcomes or are environments determinate? -- we must distinguish between outcomes at the population level and outcomes at the organizational level. Going back to Assumption 1 in our theoretical development, we find that if environments are coercive, only organizations that meet organizational demands will survive. For explaining behavior at the population level this suggests that environmental forces
will be sufficient for explaining adaptation. In both economics and organization theory we are often content in explaining behavior at the level of a population or industry. A direct corollary of Assumption 4 is the following:

**Corollary 4:** If environments are coercive, the population of an organization will converge toward an equilibrium in which environmental demands will be met.

In the long run even though ambiguity will affect the behavior and outcomes of organizations, ambiguity gets resolved at the population level through a natural selection process. But if environments are ambiguous, behavior at the organizational level cannot be completely explained by environmental forces. A theory of environmental determination will fail to explain which organizations will change to respond to the environment and when organizational change will be adaptive. Under conditions of ambiguity, economic, political and cultural forces affect the structuring of organizations, influencing organizational outcomes independent of environmental demands.

**Power, Politics, and Organizational Change**

Organizations are frequently treated as unitary actors that make decisions (Coleman, 1974). This view, while useful in some contexts, fails to account for the existence of internal and conflicts of interests within organizations and between their stakeholders and their effects on organizational action. The acknowledgment of power and conflict is particularly critical for developing a theory of organizational change for all organizational change involves a shift in the power structure of an organization. This is most evident with organizational changes in authority structures which by definition alter the rules for participation in decision making and change the capacity of actors to influence organizational behavior. Changes in strategies and technologies also alter power relations within organizations, although these effects may be less direct. Changes in strategies and/or technologies, even if unaccompanied by formal changes in authority, will alter the value of the resources and capabilities held by individual participants and will affect their ability to exert influence and control over the organization (Pfeffer and Salancik, 1978; Pfeffer, 1981).
Organizations can be understood as shifting political coalitions of actors who exert varying demands on organizations and who exert varying degrees of attention to these demands (March and Simon, 1958; March, 1962; Cyert and March, 1963). The structuring of organizational change is constrained by the existing political coalition and at the same time transforms it. When organizational change takes place a new political order emerges but this order must be negotiated within the existing order.

The development of a new political order within the existing order creates a paradox for our understanding of the process of organizational change. In an organization’s response to environmental changes, the organization’s authority structures mediate the response and the dominant coalition chooses the organizational action. If a political coalition is stable and unchallenged by other forces, and the change in the environment is ambiguous, the dominant coalition will act to retain the organization’s authority structure. Changes in strategies and technologies will be adopted, all else being equal, only if the changes will not affect the existing authority structure of the participants in the decision-making structure. This leads most organizational analysts to argue that organizational change will be restrained by the existing political coalitions. (Pfeffer, 1981; Hannan and Freeman, 1989).

The extent to which political coalitions serve to constrain organizational change depends both on the ambiguity of the environment and on the stability of the dominant coalition. Organizational coalitions have a history and a degree of connectedness which affects organizational outcomes. Organizational forms differ in the stability of their coalitions and in the extent to which political conflict threatens the coalition (Mintzberg, 1989). Recurrent challenges to a dominant coalition undermine its stability and permit new authority structures to emerge.

Changes in authority structure serve as instrument for actors to gain political influence and control over an organization. Reorganizations, although legitimated as responses to environmental forces, are instruments for new groups of actors to gain political control of an organization. This leads us to conclude that under conditions of ambiguity, the effect of the political coalition on change will depend on the stability of the coalition when organizational
change is contemplated. If the coalitions are unstable, organizational change becomes a powerful instrument for new groups to gain control of the organization.

The relationship between CEO successions and organizational change processes is an important example of how power dynamics affect organizational change. Chandler (1962) found that the adoption of the multidivisional form, a major organizational restructuring, often required a change in the CEO before it took place. Part of the traditional explanation for this phenomenon is that the previous political coalition of the organization resisted change because of its effect on its own power structure. Ocasio’s (1993) analysis suggests, however, that there is another side to the relationship between power and organizational change. CEOs when they come in to power face incumbent subordinates and boards of directors that have independent sources of power and were even, in some cases, rivals for her position. Under these conditions, with an unstable political coalition now in place, organizational restructuring becomes a powerful and legitimated means for new CEOs to transform the previous existing political coalition and shape the formation of a new coalition more responsive to her own interests.

**INSTITUTIONALIZATION OF CHANGE**

The institutionalized myth of organizational change has transformed the environment of large-scale organizations, particularly in the private for-profit sector, during the past quarter century. Research and development, product planning and development, strategic planning, and management development have all emerged as institutionalized rules and procedures that lend legitimacy to change efforts in organizations. Business researchers, consulting firms, and business periodicals have played a major role in propagating these procedures. Academic research on strategy and on organizations as open systems have transformed the way management is both practiced and conceived. Changes in strategy and reorganizations are now widely considered as legitimate solutions for a wide range of organizational problems and are an important component of organizational actions.

Faced with integrating the ideas of change and rationality, institutionalized procedures for change were initially concerned with planning and controlling these processes. Given the
inevitable ambiguity of any significant change effort, efforts to rationalize research, strategy development and organizational change have been widely challenged, particularly in the business literature (Kidder, 1981; Kanter, 1983; Peters, 1988). Parallel organizations (Kanter, 1983) and skunkworks (Peters and Austin, 1985), have been some of the “suboptimal” procedures proposed to deal with change. In an influential article, Hayes and Abernathy (1980) questioned the use of rational tools of management and argued that they served to limit new product and process developments and led to “economic decline.”

We believe that organizational change may become, if it hasn’t already, the dominant institutionalized myth of large American corporations, taking precedence over the myth of rationality and efficiency when they are in conflict. The institutionalization of organizational change is a powerful force in promoting change over stability as a response to environmental demands. Ecological perspectives on inertia ignore the institutionalization of this new myth and that when the myth of change is institutionalized, accountability requires that organizations be changing their structures to conform to this myth.

The institutionalization of change has occurred most frequently in large corporations. In the public sector, large scale efforts at organizational change have been attempted, but they have often failed and not become institutionalized (March and Olsen, 1989). The Clinton administration has made change their overriding concern. As of this writing the successful institutionalization of the myth of change in the federal government remains a question mark. Non-profit institutions have in some cases (hospitals, certain social service organizations) developed institutionalized procedures for strategic planning, although typically not for changes in the authority structure. The extent to which organizational change is becoming institutionalized in the different sectors of the economy and society is an unresearched topic.

CONCLUSIONS

Neither the once-dominant adaptationists’ views nor the challenge presented by population ecologists are able to account for the existence of both inertia and adaptation in organizations. In this paper we have begun to analyze the conditions under which organizations
change and adapt to their environment, remain stable or change in ways that do not correspond to environmental demands. This paper contributes to the debate on inertia versus adaptation by examining (a) how environmental selection favors different levels of reproducibility and flexibility of structures under different conditions of variability and frequency of change, (b) how organizations and populations respond to environmental changes through stability or change under conditions of coercive environments, and (c) how ambiguity in organizational environments requires to consider the interaction of economic, political, and cultural forces to explain change at the organizational level, even in the case of coercive environments, and for population level changes when environments are not fully coercive.

The following conclusions have been reached:

1. A theory of inertia and adaptation must distinguish between organizational stability and change and their adaptive consequences. Organizational change must not be confused with adaptation since all change may not have adaptive consequences. Likewise, organizational stability may be adaptive under certain conditions.

2. Hannan and Freeman’s theory of structural inertia (1984, 1989) applies with much less generality than they proposed. Structural inertia can be derived as a consequence of long-run environmental selection only when environments are relatively stable and organizational learning about the nature of environmental change does not occur. Hannan and Freeman’s theory can be reinterpreted as support for the survival properties of traditional unitary form bureaucracies, with their corresponding features of high structural inertia and reproducibility. But an implicit assumption is that environments that favor bureaucracies are relatively stable.

3. The variability and frequency of environmental change determine the survival prospects of organizational structures that are highly reproducible or flexible in their core or their peripheral features, and the corresponding features of structural inertia and transformability. With both high frequency and high variability of change, high flexibility in both core and peripheral structures will be favored, as in the case of hybrid or network forms of organizations. Under high frequency but low variability of change, organizational structures with highly reproducible core
features, which limit high variability change, but high flexibility in their peripheral features, which allow for high frequency of incremental change, will be favored. Under low frequency but high variability of high change, highly decomposable organizations with highly reproducible subunits will be favored. The reproducibility of the subunits allows for the advantages of reproducibility under long run of relative stability at the same time that decomposability permits high variability change to take place through the variation, selection, and retention of separable organizational subunits.

4. Environmental coerciveness and organizational slack are important determinants of organizational adaptability. If environments are coercive and change is unambiguous, organizations will attempt to change and adapt to the environment. But organizational change is often costly, and the organization's ability to change will depend on the existence of organizational slack.

5. The existence of an inverse relationship between age and organizational mortality rates found by population ecologists may reflect the increasing accumulation of organizational slack with age, and the higher survival prospects for organizations with higher levels of slack. This alternative explanation of the liability of newness found in the population ecology literature holds when environments are coercive and change is unambiguous.

6. The existence of ambiguity greatly complicates the analysis of organizational inertia and adaptation. If environments are coercive, change at the population level will reflect organizational demands. Functionalist theories, however will not explain change at the organizational level and political, cultural and economic forces all have an autonomous influence on organizational stability and change.

We have just begun to analyze the effects of ambiguity on the structuring of organizational change. Economic, structural, and cultural forces all have an autonomous role in the internal dynamics of organizational structuring (Fombrun, 1986). An understanding of this dynamic requires a theory of how each of these forces affects organizational change and how they interact over time with the environmental selection process.
7. The stability of an organization's dominant political coalition is an important determinant of organizational change. If environments are ambiguous, stable political coalitions will act to preserve their structures. If coalitions are unstable, organizational responses to the environment shape the development of new organizational coalitions and change may be used as a vehicle for organizational actors to gain power in the organization.

8. Organizational change and adaptation reflect societal and organizational field norms regarding the desirability of organizational change. During the last twenty-five years, organizational change has emerged as a powerful institutionalized myth, particularly in business organizations, that brings legitimacy to organizational change as a response to an ambiguous environment. Originally the institutionalization of change was subsumed within the myth of rationality. Rationalized, planned change became the norm and strategic planning and planned change efforts were widely diffused. Contradictions between the norms of rationality and the norms of change have emerged.

This paper has contributed to the debate on inertia versus adaptation in organizations by specifying a set of boundary conditions under which both organizational inertia and adaptation can be observed. The set of assumptions and theorems derived provide a set of testable propositions that can serve to both interpret contradictory findings of past work and to guide future empirical research. Attention to both environmental selection and organizational structuring is necessary if further progress is to be made in the theoretical and empirical determination of inertia, adaptation, and change in organizations.
REFERENCES


<table>
<thead>
<tr>
<th>Organizational Structuring</th>
<th>Environmental Consequence</th>
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<tbody>
<tr>
<td></td>
<td>Adaptive Failure</td>
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<tr>
<td>Transformation of Structure</td>
<td>III. Non-Adaptive Change</td>
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TABLE 2
Most Favored Structural Characteristics for Different Forms of Environmental Change

<table>
<thead>
<tr>
<th>Variability of Environmental Change</th>
<th>Frequency of Change (Grain)</th>
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<tbody>
<tr>
<td></td>
<td>Low Frequency (Coarse)</td>
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<tr>
<td>Low Variability</td>
<td>Highly reproducible structures</td>
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<td></td>
<td>Unitary form bureaucracies</td>
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<tr>
<td>Examples</td>
<td>Multidivisional Forms</td>
</tr>
<tr>
<td>High Variability</td>
<td>Highly decomposable structures with highly reproducible subunits</td>
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<td>Examples</td>
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