Explaining Development and Change in Organizations

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IN ORGANIZATIONS

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This article introduces four basic theories that may serve as building blocks for explaining processes of change in organizations: life cycle, teleology, dialectics, and evolution. These four theories represent different sequences of change events that are driven by different conceptual motors and operate at different organizational levels. This article identifies the circumstances when each theory applies and proposes how interplay among the theories produces a wide variety of more complex theories of change and development in organizational life.

Explaining how and why organizations change has been a central and enduring quest of scholars in management and many other disciplines. The processes or sequences of events that unfold in these changes—such as transitions in individuals' jobs and careers, group formation and development, and organizational innovation, growth, reorganization, and decline—have been very difficult to explain, let alone manage. To understand how organizations change, management scholars have borrowed many concepts, metaphors, and theories from other disciplines, ranging from child development to evolutionary biology. These concepts include punctuated equilibrium, stages of growth, processes of decay and death, population ecology, functional models of change and development, and chaos theory. This variation has created a theoretical pluralism that has uncovered novel ways to explain some organizational change and developmental processes. However, the diversity of theories and concepts borrowed from different disciplines often encourages compartmentalization of perspectives that do not enrich each other and produce isolated lines of research (Gioia & Pitre, 1990). As Poggie (1965: 284) said, "A way of seeing is a way of not seeing."

It is the interplay between different perspectives that helps one gain

a more comprehensive understanding of organizational life, because any one theoretical perspective invariably offers only a partial account of a complex phenomenon. Moreover, the juxtaposition of different theoretical perspectives brings into focus contrasting worldviews of social change and development. Working out the relationships between such seemingly divergent views provides opportunities to develop new theory that has stronger and broader explanatory power than the initial perspectives.

Some integration is thus desirable, but it must preserve the distinctiveness of alternative theories of organizational change and development. We contend that such integration is possible if different perspectives are viewed as providing alternative pictures of the same organizational processes without nullifying each other. This can be achieved by identifying the viewpoints from which each theory applies and the circumstances when these theories are interrelated. This approach preserves the authenticity of distinct theories, and at the same time advances theory building, because it highlights circumstances when interplays among the theories may provide stronger and broader explanatory power of organizational change and development processes (Van de Ven & Poole, 1988; Poole & Van de Ven, 1989).

We apply this approach in three parts of this article. On the basis of an interdisciplinary literature review, Part I introduces four basic types of process theories that explain how and why change unfolds in social or biological entities: life-cycle, teleological, dialectical, and evolutionary theories. These four types represent fundamentally different event sequences and generative mechanisms—we will call them *motors*—to explain how and why changes unfold. Part II arranges these four ideal-type process theories into a typology by distinguishing the level and mode of change to which each theory applies. Part III considers how the typology is useful for understanding a variety of specific theories of change processes in organizations. We contend that all specific theories of organizational change and development can be built from one or more of the four basic types. Although some theories can be reduced to one of the motors, most are predicated on the interplay of two or more motors. We consider a scheme of 16 logical explanations of organizational change and development based on various combinations of the four motors and some exemplars.

We believe this framework is useful in several ways. First, it is a step toward more parsimonious explanations of organizational change and development. It uncovers similarities in seemingly different theories of change or development and highlights the "differences that make a difference" in explanations. The four motors serve as theoretical "primitives" facilitating the integration of related explanations. Second, the framework serves normative functions. The four basic theories provide useful standards to evaluate the form, completeness, and tightness of specific developmental theories. Third, this framework promotes new theories by identifying possible explanations of organizational change and development that do not yet exist in the literature. Fourth, the frame-

work supports inductive research by identifying characteristics of the four motors and the conditions under which they are likely to operate. Rather than working from preconceived change theories, we can test the existence of the primitive motors in order to see which fits the complex phenomenon being examined. This testing helps to prevent the self-fulfilling prophecies that may occur when a researcher expects a certain number of stages of development or a certain process; it is too easy to find evidence in complex processes for whatever one expects and therefore to ignore other motors (Poole, 1981).

Throughout this article, we refer to *process* as the progression (i.e., the order and sequence) of events in an organizational entity's existence over time.[1] *Change*, one type of event, is an empirical observation of difference in form, quality, or state over time in an organizational entity. The *entity* may be an individual's job, a work group, an organizational strategy, a program, a product, or the overall organization. *Development* is a *change process* (i.e., a progression of change events that unfold during the duration of an entity's existence—from the initiation or onset of the entity to its end or termination). Finally, we refer to a *process theory* as an explanation of how and why an organizational entity changes and develops. This explanation should identify the generative mechanisms that cause observed events to happen and the particular circumstances or contingencies behind these causal mechanisms (Harre & Madden, 1975; Tsoukas, 1989).

We have chosen abstract and general definitions because we wish to open the field to a wide range of theories. Also, we wish to avoid the common assumption that all development represents progress from a lower, simpler state to a higher, more complex one. This is one possible path development may follow, but it is not the only one. Organizational development can also follow a regressive path, as in the case of organizational decline (Kimberly & Miles, 1980), or a pathological path, as in Merton's (1968) vicious cycle of bureaucracy.

I. FOUR IDEAL-TYPE DEVELOPMENTAL THEORIES

We conducted an interdisciplinary literature review to identify alternative theories used to explain processes of change in the social, biological, and physical sciences.[2] We found about 20 different process theories

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[1] Our developmental view of process should not be confused with two other uses of *process* in the management literature. Here, *process* refers to either (1) the underlying logic that explains a causal relationship between independent and dependent variables in a variance theory or (2) a category of concepts of organizational actions (e.g., rates of communications, work flows, decision-making techniques, or methods for strategy making). These concepts or mechanisms may be at work to explain an organizational result, but they do not describe how these variables or mechanisms unfold or change over time.

[2] This review was assisted by a computerized literature search across disciplines using *change* and *development* as keywords. To our surprise, more than 1 million articles have been published on the subject in the disciplines of psychology, sociology, education,

that vary in substance or terminology across disciplines. By inductively examining the substance and intellectual heritage of these theories, we found that most of them could be grouped into four basic schools of thought. Each of these four schools has a rich and long-standing intellectual tradition, although various disciplines use different terminologies. We will refer to them as life-cycle, teleology, dialectics, and evolution theories. Table 1 outlines the four types of process theories in terms of their members, pioneering scholars, event progressions, generative mechanisms, and conditions under which they are likely to operate. These theories provide fundamentally different accounts of the sequence of events that unfold to explain the process of change in an organizational entity.

This section describes the four process theories in their pure ideal-type forms. As discussed in Part III, scholars often combine elements of these ideal types to explain observed processes of change in specific areas or contexts. However, in such cases it is very easy for the conceptual basis of specific theories to become obscure. As Kaplan (1964) warned, borrowing concepts from different theories without understanding the theoretical "roots" of these concepts can produce confounded explanations.

Life-Cycle Theory

Many management scholars have adopted the metaphor of organic growth as a heuristic device to explain development in an organizational entity from its initiation to its termination. Witness, for example, often-used references to the life cycle of organizations, products, and ventures, as well as stages in the development of individual careers, groups, and organizations: startup births, adolescent growth, maturity, and decline or death. Life-cycle theories include developmentalism (Nisbet, 1970), biogenesis (Featherman, 1986), ontogenesis (Baltes, Dittman-Kohli, & Dixon, 1986), and a number of stage theories of child development (Piaget, 1975), human development (Levinson, 1978), moral development (Kohlberg, 1969), organizational development (Kimberly & Miles, 1980), group decision-making stages (Bales & Strodtbeck, 1951), and new venture development (Burgelman & Sayles, 1986).[3] Next to teleology, life cycle is perhaps

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business, and economics, as well as biology, medicine, meteorology, and geography. Of course, not all these articles addressed theories of change or development; the vast majority focused on other substantive issues and dealt with change processes in a cursory fashion. To cope with this prolific literature, we reviewed about 200,000 titles and perused about 2,000 abstracts, which led us to carefully read about 200 articles that were useful in identifying about 20 different process theories of development or change.

[3] The classification of management and organization literature into the life-cycle and other ideal types of theories in this article is very loose and done for illustrative purposes. Because little attention has been given to underlying theories of change processes in the management and organization literature, it is difficult to know what specific theories of change the authors of cited works had in mind.

TABLE 1
Families of Ideal-Type Theories of Social Change

Family	Life Cycle	Evolution	Dialectic	Teleology
Members	Developmentalism Ontogenesis Metamorphosis Stage & cyclical models	Darwinian evolution Mendelian genetics Saltationism Punctuated equilibrium	Conflict theory Dialectical materialism Pluralism Collective action	Goal setting, planning Functionalism Social construction Symbolic interaction
Pioneers	Comte (1798–1857) Spencer (1820–1903) Piaget (1896–1980)	Lamarck (1744–1829) Darwin (1809–1882) Mendel (1822–1884) Gould & Eldridge (1977)	Hegel (1770–1831) Marx (1818–1883) Freud (1856–1939)	Mead (1863–1931) Weber (1864–1920) Simon (1916–)
Key Metaphor	Organic growth	Competitive survival	Opposition, conflict	Purposeful cooperation
Logic	Imminent program Prefigured sequence Compliant adaptation	Natural selection among competitors in a population	Contradictory forces Thesis, antithesis, synthesis	Envisioned end state Social construction Equifinality
Event Progression	Linear & irreversible sequence of prescribed stages in unfolding of immanent potentials present at the beginning	Recurrent, cumulative, & probabilistic sequence of variation, selection, & retention events	Recurrent, discontinuous sequence of confrontation, conflict, and synthesis between contradictory values or events	Recurrent, discontinuous sequence of goal setting, implementation, and adaptation of means to reach desired end state
Generating Force	Prefigured program/rule regulated by nature, logic, or institutions	Population scarcity Competition Commensalism	Conflict & confrontation between opposing forces, interests, or classes	Goal enactment consensus on means cooperation/symbiosis

the most common explanation of development in the management literature.

According to life-cycle theory, change is imminent: that is, the developing entity has within it an underlying form, logic, program, or code that regulates the process of change and moves the entity from a given point of departure toward a subsequent end that is prefigured in the present state. Thus, the form that lies latent, premature, or homogeneous in the embryo or primitive state becomes progressively more realized, mature, and differentiated. External environmental events and processes can influence how the entity expresses itself, but they are always mediated by the immanent logic, rules, or programs that govern the entity's development (Van de Ven & Poole, 1988: 37).

The typical progression of change events in a life-cycle model is a unitary sequence (it follows a single sequence of stages or phases), which is cumulative (characteristics acquired in earlier stages are retained in later stages) and conjunctive (the stages are related such that they derive from a common underlying process). There is such a progression because the trajectory to the final end state is prefigured and requires a specific historical sequence of events. Each of these events contributes a piece to the final product, and they must occur in a prescribed order, because each piece sets the stage for the next. Each stage of development is seen as a necessary precursor of succeeding stages.

Life-cycle theory parallels the approach of the gross anatomist in biology, who observes a sequence of developing fetuses, concluding that each successive stage evolved from the previous one. Hence, Nisbet (1970) claimed that organizational development is driven by some genetic code or prefigured program within the developing entity. Flavell (1982) expanded Nisbet's interpretation by discussing a number of historically driven processes of cognitive development, in which each stage logically presupposes the next, such as when the development of manipulative skills precedes writing. There is no reason to suppose organizational systems could not have such processes as well.

Life-cycle theories of organizational entities often explain development in terms of institutional rules or programs that require developmental activities to progress in a prescribed sequence. For example, the U.S. Food and Drug Administration regulates a sequence of steps that all firms must follow to develop and commercialize a new drug or biomedical product. Other life-cycle theories rely on logical or natural sequences in the development of organizational entities. For example, Rogers (1983) posited five stages of innovation: need recognition, research on problem, development of idea into useful form, commercialization, and diffusion and adoption. The order among these stages is necessitated both by logic and by the natural order of Western business practices.

Teleological Theory

Another school of thought explains development by relying on teleology, or the philosophical doctrine that purpose or goal is the final cause

for guiding movement of an entity. This approach underlies many organizational theories of change, including functionalism (Merton, 1968), decision making (March & Simon, 1958), epigenesis (Etzioni, 1963), voluntarism (Parsons, 1951), social construction (Berger & Luckmann, 1966), adaptive learning (March & Olsen, 1976), and most models of strategic planning and goal setting (Chakravarthy & Lorange, 1991).

According to teleology, development of an organizational entity proceeds toward a goal or an end state. It is assumed that the entity is purposeful and adaptive; by itself or in interaction with others, the entity constructs an envisioned end state, takes action to reach it, and monitors the progress. Thus, proponents of this theory view development as a repetitive sequence of goal formulation, implementation, evaluation, and modification of goals based on what was learned or intended by the entity. The theory can operate for an individual or for a group of individuals or organizations who are sufficiently like-minded to act as a single collective entity. Teleology inherently affords creativity because the entity, consisting of an individual or group, has the freedom to enact whatever goals it likes.

Unlike life-cycle theory, teleology does not prescribe a necessary sequence of events or specify which trajectory development of the organizational entity will follow. However, this theory implies a standard for judging change: development is something that moves the entity toward its final state. Some teleological models incorporate the systems theory assumption of equifinality (i.e., there are several equally effective ways to achieve a goal). In this theory, there is no prefigured rule, logically necessary direction, or set sequence of stages in a teleological process. Instead, proponents of this theory focus on the prerequisites for attaining the goal or end state: the functions that must be fulfilled, the accomplishments that must be achieved, or the components that must be built or obtained for the end state to be realized. These prerequisites can be used to assess if an entity is developing; that is, it is growing more complex or more integrated, or it is filling a necessary set of functions. We are able to make this assessment because teleological theory posits an envisioned end state for an entity, and we are able to observe movement toward the end state vis-à-vis this standard.

Although teleology stresses the purposiveness of the actor or unit as the motor for change, it also recognizes limits on action. The organization's environment and resources constrain what it can accomplish. Some of these constraints are embodied in prerequisites defined by institutions and other actors in the entity's environment. Individuals do not override natural laws or environmental constraints, but they make use of such laws or constraints to accomplish their purposes (Commons, 1950; Gibson, 1988).

Once an entity attains its goal, this does not mean it stays in permanent equilibrium. Goals are socially reconstructed and enacted based on past actions (Weick, 1979). Influences in the external environment or within the entity itself may create instabilities that push it toward a new

developmental path. Theories that rely on a teleological process cannot specify what trajectory development of an organizational entity will follow. Proponents of such theories can at best list a set of possible paths and then rely on norms of decision rationality or action rationality (Brunsson, 1982) to prescribe certain paths.

Dialectical Theory

A third school, dialectical theory, begins with the Hegelian assumption that the organizational entity exists in a pluralistic world of colliding events, forces, or contradictory values that compete with each other for domination and control. These oppositions may be internal to an organizational entity because it may have several conflicting goals or interest groups competing for priority. Also, oppositions may be external to the organizational entity as it pursues directions that collide with the direction of other organizations. In any case, a dialectical theory requires two or more distinct entities that embody these oppositions to confront and engage one another in conflict.

In a dialectical process theory, stability and change are explained by reference to the balance of power between opposing entities. Struggles and accommodations that maintain the status quo between oppositions produce stability. Change occurs when these opposing values, forces, or events gain sufficient power to confront and engage the status quo. The relative power of an antithesis may mobilize an organizational entity to a sufficient degree to challenge the current thesis or state of affairs and set the stage for producing a synthesis. So, for example, an entity subscribing to a thesis (A) may be challenged by an opposing entity with an antithesis (Not-A), and the resolution of the conflict produces a synthesis (which is Not Not-A). Over time, this synthesis can become the new thesis as the dialectical process continues. By its very nature, the synthesis is a novel construction that departs from both the thesis and antithesis.

However, there is no assurance that dialectical conflicts produce creative syntheses. Sometimes an opposition group mobilizes sufficient power to simply overthrow and replace the status quo. Thus, also, many organizations persist by maintaining sufficient power to suppress and prevent the mobilization of opposition groups. In the bargaining and conflict management literature, the desired creative synthesis is one that represents a win-win solution, whereas either the maintenance of the thesis or its replacement with an antithesis is often treated as a win-lose outcome of a conflict engagement (Neal & Northcraft, 1991). In terms of organizational change, maintenance of the status quo represents stability, but its replacement with either the antithesis or the synthesis represents a change, for the better or worse.

Evolutionary Theory

Although evolution is sometimes equated with change, we use evolution in a more restrictive sense to focus on cumulative changes in struc-

tural forms of populations of organizational entities across communities, industries, or society at large (Aldrich, 1979; Campbell, 1969; Hannan & Freeman, 1977).[4] As in biological evolution, change proceeds through a continuous cycle of variation, selection, and retention. Variations, the creations of novel forms of organizations, are often viewed to emerge by blind or random chance; they just happen (Aldrich, 1979; Campbell, 1969). Selection of organization occurs principally through the competition for scarce resources, and the environment selects entities that best fit the resource base of an environmental niche (Hannan & Freeman, 1977). Retention involves forces (including inertia and persistence) that perpetuate and maintain certain organizational forms. Retention serves to counteract the self-reinforcing loop between variations and selection. Weick (1979) and Pfeffer (1982) noted that variations stimulated the selection of new organizational forms, but retention maintained previous forms and practices. Thus, evolution explains change as a recurrent, cumulative, and probabilistic progression of variation, selection, and retention of organizational entities. This motor is prescribed in the sense that one can specify the actuarial probabilities of the changing demographic characteristics of the population of entities inhabiting a niche. Although one cannot predict which entity will survive or fail, the overall population persists and evolves through time, according to the specified population dynamics.

In organization and management applications, evolutionary theory often depicts global changes in organizational populations (e.g., Carroll & Hannan, 1989), although Burgelman (1991) and Singh and Lumsden (1990) adopted the evolutionary model to explain strategy making within organizations, and Weick (1979) and Gersick (1991) applied parts of evolutionary theory at a microlevel to explain the social-psychological processes of organizing. Whatever the organizational level, an evolutionary model can be used to focus on processes of variation, selection, and retention among numerous organizational entities.

Alternative theories of organizational evolution can be distinguished in terms of how traits are inherited, the rate of change, and the unit of

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[4] There are many different theories of evolution. Some scholars (e.g., March, 1994) have taken a very broad view (*evolution* equals our definition of *development*, or the dynamic sequence of changes over time). We take a more restrictive meaning and focus on adoptions of biological evolutionary theories. This restriction avoids historical confusions between early sociological evolutionism and biological evolutionism. Sztompka (1993) pointed out that early sociologists (e.g., Comte & Spencer) adopted the metaphor of organic growth (but not Darwinian or biological ideas) to examine the life span of society from its rudimentary state toward ever-increasingly more differentiated and "higher" levels. (This early sociological evolutionism is closer to a life-cycle theory than it is to biological evolutionary theory.) Some absurd extremes were drawn with this theory, and Nisbet (1970) and others attacked it; thus, most contemporary social scientists have adopted the biological evolutionary theories of Darwin, Lamarck, Gould, and Mendel. We focus only on biological evolution and distinguish its contemporary versions in the organizational and management literature.

analysis. Organizational scholars who adopt Darwinian evolution (e.g., Hannan & Freeman, 1977, 1989; McKelvey, 1982) argue that traits are inherited through intergenerational processes, whereas those who follow Lamarck (e.g., Boyd & Richerson, 1985; Burgelman, 1991; Singh & Lumsden, 1990; Weick, 1979) argue that traits are acquired within a generation through learning and imitation. A Lamarckian view on the acquisition of traits appears more appropriate than strict Darwinism for organization and management applications. As McKelvey (1982) pointed out, strict Darwinists have developed no adequate solutions to operationally identify an organizational generation.
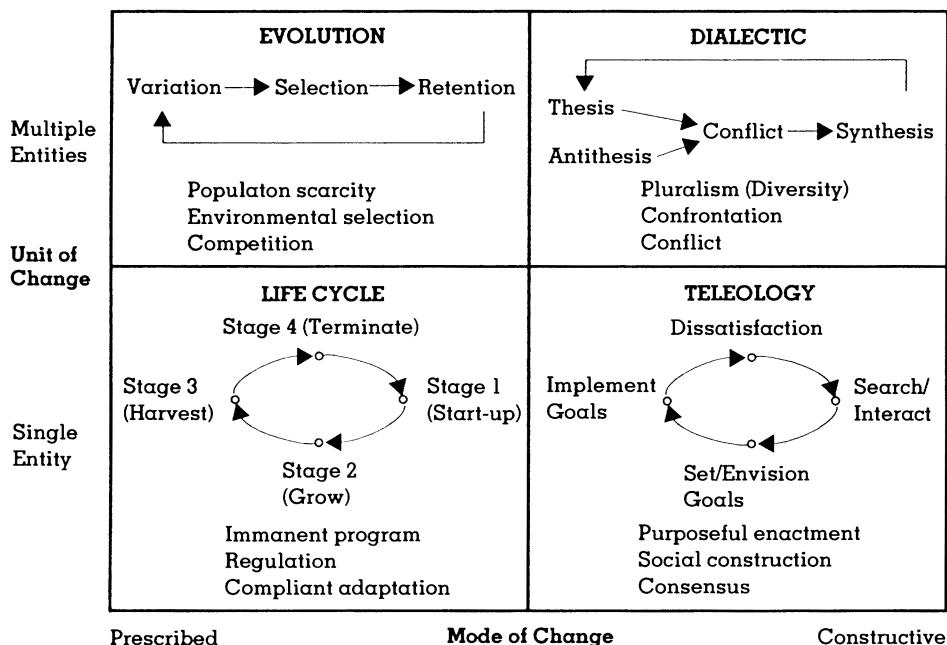
Darwinian theorists emphasize a continuous and gradual process of evolution. In *The Origin of Species,* Darwin (1936: 361) wrote, "as natural selection acts solely by accumulating slight, successive, favourable variations, it can produce no great or sudden modifications; it can act only by short and slow steps." Other evolutionists posit a saltation theory of evolution, such as punctuated equilibrium (Arnold & Fristrup, 1982; Gould & Eldridge, 1977). Whether change proceeds at gradual versus saltation rates is an empirical matter. Thus, the rate of change does not fundamentally alter the theory of evolution (as it has been adopted by organization and management scholars).

The paleontologist Gould (1989) argued that another basic distinction between Darwinian evolution and his punctuated equilibrium theory is hierarchical level. Astley (1985) and Baum and Singh (1994) made this distinction, but Tushman and Romanelli (1985) did not. Gould (1989) pointed out that classical Darwinism locates the sorting of evolutionary change at a single level of objects. This sorting is natural selection operating through the differential births and deaths of organisms, as exemplified in many studies on organizational birth and death rates by population ecologists. (See reviews in Carroll and Hannan, 1989, and Hannan and Freeman, 1989.) Gould's punctuated equilibrium model adds a hierarchical dimension to evolutionary theory by distinguishing this sorting (the growth or decline of organisms of a given species through differential birth and death rates) from speciation (the process by which new species or a subgenus is formed). "Speciation is a property of populations [adaptation is a property of organisms within a population], . . . while extinction [a sorting process] is often a simple concatenation of deaths among organisms" (Gould, 1989: 122).

II. A TYPOLOGY OF CHANGE PROCESS THEORIES

Life-cycle, teleology, dialectical, and evolutionary theories provide four internally consistent accounts of change processes in organizational entities. Where and when do these theories apply to explain development in organizational entities? To address this question, it is useful to emphasize four distinguishing characteristics in the preceding discussion of the four theories. In each theory: (a) process is viewed as a different cycle

Figure 1
Process Theories of Organizational Development and Change[a]

	EVOLUTION	DIALECTIC
Multiple Entities	Variation ──▶ Selection ──▶ Retention	Thesis ⟍ ↘ Conflict ──▶ Synthesis, Antithesis ⟋
	Populaton scarcity Environmental selection Competition	Pluralism (Diversity) Confrontation Conflict
Unit of Change	LIFE CYCLE	TELEOLOGY
	Stage 4 (Terminate) Stage 3 (Harvest) Stage 1 (Start-up) Stage 2 (Grow)	Dissatisfaction Implement Goals Search/Interact Set/Envision Goals
Single Entity	Immanent program Regulation Compliant adaptation	Purposeful enactment Social construction Consensus

Prescribed   **Mode of Change**   Constructive

[a] Arrows on lines represent likely sequences among events, not causation between events.

of change events, (b) which is governed by a different "motor" or generating mechanism that (c) operates on a different unit of analysis and (d) represents a different mode of change. Figure 1 provides a metatheoretical scheme for illustrating and distinguishing the four ideal-type theories in terms of these four characteristics. We will now discuss these distinguishing characteristics.

Cycles and Motors of Change

As the cells of Figure 1 illustrate, in each theory the process of development is viewed as unfolding in a fundamentally different progression of change events and is governed by a different motor.

1. A life-cycle model depicts the process of change in an entity as progressing through a necessary sequence of stages. An institutional, natural, or logical program prescribes the specific contents of these stages.

2. A teleological model views development as a cycle of goal formulation, implementation, evaluation, and modification of goals based on what was learned by the entity. This sequence emerges through the purposeful social construction among individuals within the entity.

3. In dialectical models of development, conflicts emerge between

entities espousing opposing thesis and antithesis that collide to pro-
duce a synthesis, which in time becomes the thesis for the next cycle
of a dialectical progression. Confrontation and conflict between op-
posing entities generate this dialectical cycle.
4. An evolutionary model of development consists of a repetitive se-
   quence of variation, selection, and retention events among entities in
   a designated population. Competition for scarce environmental re-
   sources between entities inhabiting a population generates this evo-
   lutionary cycle.

Figure 1 shows two analytical dimensions that are useful for classi-
fying these developmental progressions in the four ideal-type process
theories: the unit and mode of change.

Unit of Change

Change and developmental processes go on at many organizational
levels, including the individual, group, organization, population, and
even larger communities of organizations. This nesting of entities into
larger organizational entities creates a hierarchical system of levels. Fig-
ure 1 collapses this nested hierarchy of levels into whether the change in
question focuses on the development of a single organizational entity or
on the interactions between two or more entities. This classification high-
lights two different angles for studying change at any given organiza-
tional level: (a) the internal development of a single organizational entity
by examining its historical processes of change, adaptation, and repli-
cation, and (b) the relationships between numerous entities to understand
ecological processes of competition, cooperation, conflict, and other
forms of interaction. A similar classification was used by Baum and Singh
(1994) in their dual hierarchy framework. It distinguished between inter-
actions among organizational entities in an ecological hierarchy and ad-
aptation and replication processes within the genealogical history of an
entity.

Evolutionary and dialectical theories operate on *multiple entities*.
Evolutionary forces are defined in terms of the impact they have on pop-
ulations and have no meaning at the level of the individual entity. Dia-
lectical theories require at least two entities to fill the roles of thesis and
antithesis. Even if researchers conceptualize the dialectic as occurring
within a single person or organization, as does Riegel's (1975) dialectical
theory of child development, the motor focuses on the interaction between
two entities: the child and his or her environment. The explanatory model
is thus dropped a level, and entities are distinguished within the child's
mind and the world. Notwithstanding level, the explanation must distin-
guish at least two (and in Riegel's case four) entities that engage in the
dialectic.

Conversely, life-cycle and teleological theories operate on a *single
entity*. Life-cycle theory explains development as a function of potentials
immanent within the entity. Although environment and other entities may
shape how this immanence is manifested, they are strictly secondary.

The real push to development comes from within the single, whole developing entity. Teleological theories, too, require only a single entity's goals to explain development. A teleological theory can operate among many members of an organization when there is sufficient consensus among the members to permit them to act as a single organizational entity. Similar to life-cycle theory, interactions between entities may influence the course of development, but this is subsidiary to the teleological motor that drives individual entities to enact an envisioned end state.

Thus, as long as the entity undergoing change has a discrete identity, one can decompose the entity within a nested organizational hierarchy to examine its members or one can aggregate the entity into its larger system without losing any of the theory's explanatory power. However, if researchers decide to examine processes of change between several distinct organizational entities, they move to either a dialectical or evolutionary theory, because they must specify laws, rules, or processes by which the entities interact.

Mode of Change

The four motors also can be distinguished in terms of whether the sequence of change events is prescribed a priori by either deterministic or probabilistic laws, or whether the progression is constructed and emerges as the change process unfolds. A *prescribed* mode of change channels the development of entities in a prespecified direction, typically of maintaining and incrementally adapting their forms in a stable, predictable way. A *constructive* mode of change generates unprecedented, novel forms that, in retrospect, often are discontinuous and unpredictable departures from the past. A prescribed mode evokes a sequence of change events in accord with a preestablished program or action routine. A constructive mode, in contrast, produces new action routines that may (or may not) create an original (re)formulation of the entity. Life-cycle and evolutionary theories operate in a prescribed modality, while teleological and dialectical theories operate in a constructive modality.

A prescribed mode tends to create what Watzlawick, Weakland, and Fisch (1974) termed *first-order change*, or change within an existing framework that produces variations on a theme. The processes that produce these variations are prescribed and predictable because they are patterned on the previous state. Over the longer term, small changes may cumulate to produce a larger change in degree or quality of the entity. The uncertainty experienced by people undergoing such changes is relatively low, because they typically perceive sufficient continuity to anticipate and discern the direction of change. From his biological frame of reference, DeRosnay (1970) viewed prescribed motors as concerned with ontogenesis, involving the reproduction of entities similar to the original line.

Life-cycle and evolutionary theories incorporate a prescribed mode of change. During the life cycle, the immanent form is realized by steps, and although some steps may seem like a radical morphogenic change, there

is an underlying continuity due to the immanent form, logic, program, or code that drives development. Due to its immanent motor, very seldom do frame-breaking changes or mutations arise in life-cycle models. Evolutionary accounts rely on the statistical cumulation of small individual events to gradually change the nature of the larger population. Although a person tends to think of mutations as sudden, dramatic changes, in actuality the evolutionary system operates according to prescribed rules that determine whether the mutation "takes" and change occurs. The apparent exception to this statement, punctuated equilibrium, actually conforms to a prescribed mode of change on closer examination. In the punctuated equilibrium model of biological evolution, posited by Gould and Eldridge (1977), species emergence at the microlevel is sudden, but the diffusion of species that ultimately alters the characteristics of populations occurs through many individual events spread over quite long periods of time (on the order of millions of years) (Gould, 1989). The application of punctuated equilibrium models to organizational change by Tushman and Romanelli (1985) departs from this account and, as we will discuss in Section III, is actually a mixture of two of the theory types we have defined (see also, Poole & Van de Ven, 1989).

A constructive mode tends to generate what Watzlawick and colleagues (1974) termed *second-order change*, which is a break with the past basic assumptions or framework. The process is emergent as new goals are enacted. It can produce highly novel features; the outcome is unpredictable because it is discontinuous with the past. Those undergoing such changes may experience a high degree of uncertainty and a need to make sense of the changes. From a biological perspective, DeRosnay (1970) characterized a constructive mode of change as a phylogenetic process, which leads to the generation of originals and the emergence of new species.

Teleological and dialectical motors incorporate a constructive mode of development. By their very nature, teleological processes seek to diverge from the current order: A process that has as its goal to preserve the status quo would be a theory of statics, not dynamics. Because goals can be changed at the will of the entity and because the prerequisites may be attained in many ways, teleological theories project a situation that is in principle unpredictable and may result in discontinuity (Von Wright, 1971). As a result, a teleological motor projects fundamental and novel changes in the entity.

However, there is an apparent problem: Many theories that draw on teleology also explicate gradual processes by which the goals are realized. For example, Chakravarthy and Lorange (1991) described corporate strategic planning as a stagewise, incremental process. Such gradual accounts of goal implementation actually combine two of the ideal types, teleological theory and life-cycle theory, to form a composite model. In Section III, a number of such composites are discussed. In its pure form, however, the twin features of intentionality and the ability to change

goals at will make teleological theories inherently emergent and creative.

Dialectical theory also incorporates a constructive mode of change. The sequence by which the thesis and antithesis confront and engage each other in a conflict struggle is highly uncertain; events leading to confrontation of opposites and resolutions may occur intermittently over the course of development. The result is a synthesis that breaks the current frame and represents second-order change. It produces a revolutionary change, resulting in a new entity that is an original rather than the reproduction of some prior state or entity.

Summary

The two dimensions of unit and mode of change classify the four theories in terms of their action and process. They differ from other dimensions often used to classify theories of organizational change, such as incremental versus radical change (e.g., Tushman and Romanelli, 1985), continuous versus discontinuous change (e.g., Meyer, Goes, & Brooks, 1993), first-order versus second-order change (Meyer et al., 1993), and competence-enhancing versus competence-destroying change (Abernathy & Clark, 1985). These dimensions classify organizational changes by their consequences or outcomes, rather than by their starting or process conditions. One advantage of the typology is that it is possible to identify the motor(s) of a change process before it has concluded.

Antecedent and outcome dimensions of change processes may be related in an actuarial or statistical sense, but not in a causal manner. Statistically one should expect the vast majority of incremental, continuous and competence-enhancing changes to follow the operations of a prescribed mode, just as radical, discontinuous, and competence-destroying changes should follow from a constructive mode. These temporal relationships may not be causal. For example, the infrequent statistical occurrence of a discontinuous and radical mutation may be caused by a glitch in the operation of a prescribed life-cycle motor of change. So also, the scale up of a teleological motor designed to create a fundamental strategic reorientation of a company may fizzle, resulting only in incremental change.

Situating the four ideal motors of change and development on the two dimensions accentuates their differences and enables researchers to describe them in their pure forms. Each of the four motors depends on a different set of conditions, which are depicted in Table 2. Determining whether these conditions are satisfied enables researchers to make an initial judgment concerning whether a given type of motor explains development in a particular situation.

However, as our examples illustrate, theories of organizational change and development seldom include the ideal types in their pure forms. To understand how the ideal types figure in theoretical "practice"

TABLE 2
Conditions for Operation of Change Theories

For a Life-Cycle Motor

A singular, discrete entity exists that undergoes change, yet maintains its identity throughout the process.

The entity passes through stages distinguishable in form or function.

A program, routine, rule, or code exists in nature, social institutions, or logic that determines the stages of development and governs progression through the stages.

For a Teleological Motor

An individual or group exists that acts as a singular, discrete entity, which engages in reflexively monitored action to socially construct and cognitively share a common end state or goal.

The entity may envision its end state of development before or after actions it may take, and the goal may be set explicitly or implicitly. However, the process of social construction or sense making, decision making, and goal setting must be identifiable.

A set of requirements and constraints exists to attain the goal, and the activities and developmental transitions undertaken by the entity contribute to meeting these requirements and constraints.

For a Dialectical Motor

At least two entities exist (each with its own discrete identity) that oppose or contradict one another.

The opposing entities must confront each other and engage in a conflict or struggle through some physical or social venue, in which the opposition plays itself out.

The outcome of the conflict must consist either of a new entity that is different from the previous two, or (in degenerate cases) the defeat of one entity by the other, or a stalemate among the entities.

For an Evolutionary Motor

A population of entities exists in a commensalistic relationship (i.e., in a physical or social venue with limited resources each entity needs for its survival).

Identifiable mechanisms exist for variation, selection, and retention of entities in the population.

Macropopulation characteristics set the parameters for microlevel variation, selection, and retention mechanisms.

and to appreciate their utility, we will now consider specific theories that focus on particular types of organizational changes. For the sake of clarity, we will refer to the ideal-type theories as *motors* of change and reserve the term *theory* for the complex, specific theories that have been developed by various researchers.

III. THEORIES OF COMPLEX DEVELOPMENT AND CHANGE PROCESSES

Specific Theories as Composites of the Ideal Types

Most specific theories of organizational change and development are more complicated than the ideal types. This is so for two reasons. First,

because the organizational context of development and change extends over space and time in any specific case, it is possible for more than one motor to come into play. Organizational development and change are influenced by diverse units and actors, both inside and outside the organization. The spacial dispersion of units and actors means that different influences may be acting simultaneously on different parts of the organization, each imparting its own particular momentum to the developmental process. In some cases, more than one change motor may influence development and change. Development and change also take time to occur. As time passes, there is opportunity for different motors to come into play, especially given the dispersion of influences. The resulting observed process is multilayered and complex. Attempts to explain this process with a single motor run the risk of oversimplification and selective attention to one aspect of the change process at the expense of others.

A study of the development of a new organizational entity engaged in the development of a biomedical innovation, the cochlear implant, by Van de Ven and Garud (1993) illustrated this complexity. This innovation was shaped by change processes occurring on numerous fronts. A teleological process seemed to explain the course of development of the implant in the firm's R&D lab. In a different sphere, the action of top managers in purposefully selecting and funding it was also consistent with a teleological model, but the decision premises and timing of managerial interventions moved at a different pace than efforts of the development team. At a certain point in its development, the product had to be approved by the FDA, which required a sequence of proposals, clinical trials, and regulatory reviews and approvals. This prescribed sequence, which embodied a life-cycle motor, came into play later than the teleological motors, but it was so important that the other two centers of change had to rearrange their efforts to meet its requirements. A fourth influence operated at the larger field of researchers and clinicians concerned with hearing health: The firm's pioneering implant design was initially supported by the field, but evidence mounted that led most researchers and clinicians to switch allegiance to a competing firm's design. The complex interplay of these different motors, which operated in different times and places, created a complicated developmental sequence that was difficult to understand, until these diverse influences were sorted out.

A second reason for the complexity of specific organizational change and development theories is the inherent incompleteness of any single motor. Each motor pictured in Figure 1 has one or more components whose values are determined exogenously to the model. For example, in the evolutionary model, it is assumed that variations arise randomly, but the process that gives rise to variation remains unspecified. In the dialectical model, the origin of the antithesis is obscure, as is the source of dissatisfaction in the teleological model, and the processes that trigger start-up and termination in the life-cycle model. Other motors can be used to

account for the origin of these events. For instance, the selection process in the evolutionary model can be used to account for termination in the life cycle; the implementation step in the teleological cycle can trigger the start-up event in the life cycle and the antithesis in the dialectic. The synthesis in the dialectic could be the source of variation in the evolutionary cycle. There are many other possible interrelations. In short, events from other models are useful to remedy the incompleteness of any single model of change.

We will argue that most specific theories of organizational development and change are actually composites of two or more ideal-type motors. This decomposition of complex theories into simpler ones has several precedents. In cognitive science, Newell (1973) and Simon (1979), among others, have argued that complex behavior can be generated by the interplay of a few simple motors. In organization science, March (1981) and Masuch (1985) have shown that a few substitutions of one simple change sequence by another equally simple process can create exceedingly complicated and intractable action cycles. Poole (1983, 1985; Poole & Roth, 1989) found empirically that seemingly complex patterns of behavior in group decision making result from the interplay of life-cycle and teleological motors. Common among these approaches is the identification of simple motors, whose interplay creates a complex phenomenon.

An Array of Composite Theories of Development and Change

Each ideal type theory describes a generative mechanism or motor of change. Combinations of these motors create, in effect, hybrid change theories. The simplest form of combination is to determine which of the generating mechanisms underlying the four ideal types are evident or in operation in a given applied theory of organizational change in the literature. By specifying the presence (operation) or absence (nonoperation) of the four motors in a given situation, an array of 16 logically possible explanations of organizational change and development becomes apparent. This array, shown in Table 3, is analogous to examining the simple main and interaction effects of each of the four motors on alternative applied theories in the management literature.

The first four alternatives represent the main effects of the generating mechanisms underlying our four ideal-type theories: the immanent program of life-cycle theory, purposeful enactment of teleological theory, conflict and synthesis of dialectical theory, and competitive selection of evolutionary theory. These "single-motor theories" apply to cases when only one of the four change motors is in operation.

The next 12 alternatives represent interaction effects of the interdependent operation of two or more of the four generative mechanisms. Alternatives 5 through 10 are called *dual-motor theories* because they represent cases when only two of the four change motors are in operation in a given organizational change process. Alternatives 11 through 14 rep-

TABLE 3
Logically Possible Theories of Organizational Change
and Development

	Interplays Among Generating Mechanisms			
	Prescribed Motor Within Entity	Constructive Motor Within Entity	Constructive Motor Between Entities	Prescribed Motor Between Entities
	Immanent Program	*Purposeful Enactment*	*Conflict & Synthesis*	*Competitive Selection*
Single-Motor Theories				
1. Life cycle (Cameron & Whetten, 1983)	Yes	No	No	No
2. Teleology (March & Simon, 1958)	No	Yes	No	No
3. Dialectics (Benson, 1977)	No	No	Yes	No
4. Evolution (Hannan & Freeman, 1977)	No	No	No	Yes
Dual-Motor Theories				
5. Design hierarchy theory (Clark, 1985)	Yes	Yes	No	No
6. Group conflict (Coser, 1958; Simmel, 1908)	No	Yes	Yes	No
7. Community ecology (Astley, 1985)	No	No	Yes	Yes
8. Adaptation-selection models (Aldrich, 1979)	Yes	No	No	Yes
9. Org. growth & crisis stages (Greiner, 1972)	Yes	No	Yes	No
10. Org. punctuated equilibrium (Tushman & Romanelli, 1985)	No	Yes	No	Yes
Tri-Motor Theories				
11. Partisan mutual adjustment (Lindblom, 1965)	Yes	Yes	Yes	No
12. ?	No	Yes	Yes	Yes
13. ?	Yes	No	Yes	Yes
14. Social psychology of organizing (Weick, 1979)	Yes	Yes	No	Yes
Quad-Motor Theories				
15. ? Human development progressions (Riegel, 1976)	Yes	Yes	Yes	Yes
16. ? Garbage can (Cohen, March, & Olsen, 1972)	No	No	No	No

resent four logically possible *tri-motor theories*, when three of the four change motors operate interdependently. Alternative 15 is a *quad-motor theory*, which represents the most complex situation when all four generating mechanisms operate interdependently in a given situation. Finally, alternative 16 represents the null set, when no motor is operating.

The left column of Table 3 lists exemplary theories for some of the

16 logically possible conditions in which an organizational change or developmental process may unfold. The rows with a "?" are conditions where we could not find an exemplary theory in the literature, and they represent opportunities for new theory building. Admittedly, the authors of these exemplary theories or models may not agree with our classification, because they did not have our framework in mind when they developed their theories. However, we contend that the framework provides a useful new way to understand and discriminate between alternative theories of organizational change and development in the literature. Specifically, we propose that what distinguishes these alternative theories is their incorporation of different combinations of the four motors of change.

Space limitations prevent us from providing a systematic discussion of theories representing each of the 16 logically possible combinations of the four motors of change. Instead, we present several examples of how complex theories can be constructed from the interplay of a few simple motors of change.

Row 5: Interaction of life-cycle and teleological motors. Clark (1985), building on the work of Utterback and Abernathy (1975), developed a theory of the gradual evolution of technologies. Abernathy and Utterback had proposed that the evolution of technological production proceeded from an early, "fluid" state to one that is highly "specific" and rigid. Product innovations predominate early in this evolution, but once the nature of the product is determined, process innovations increase and will dominate until rigidity extinguishes innovation. The rise and fall of product innovations is succeeded by the rise and fall of process innovations because of the logic of the production, which pushes firms to try to optimize and standardize first the nature of a successful product, and, once the product is set, the procedures for producing it. The result is increasing rigidity throughout the life of the product.

To explain how changes in technologies come about, Clark discussed the interaction between designers and customers, which establishes functional prerequisites for the product. This teleological process is in interplay with another life-cycle motor, the technical design hierarchy. Clark (1985: 241) argued that all technical design is hierarchical, because "there are choices in the development of a design that create precedents and are logically prior to other choices. These precedents create constraints that give rise to further search for alternative designs." Once an organization takes a certain technical path, this forecloses other paths and opens up a hierarchy of subproblems. Interaction between designers and customers influences progression through a hierarchy; the natural direction of movement is down the hierarchy until the technical agenda is fulfilled, but customer demands may encourage designers either to move back up the hierarchy and pursue other paths, or to jump to a different aspect of the design problem. Hence, Clark's (1985) theory provides for the interplay of teleological and life-cycle motors nested within the overall life-cycle progression from product to process emphases.

Row 9: Interaction of life-cycle and dialectical motors. In one of the earliest models of organizational development, Greiner (1972) proposed five stages to the life cycle of organizational growth through creativity, direction, delegation, coordination, and collaboration. Each of these stages culminates in a different dialectical crisis (of leadership, autonomy, control, red tape, and ?), which propels the organization into the next stage of growth. Thus, the model is grounded in temporal interactions between life-cycle and dialectical theories of change. In the main, the model is rooted in a life-cycle theory of change, in which "historical forces [organization age, size, growth rate, and stages of evolution and revolution] shape the future growth of organizations" (Greiner, 1972: 166). Greiner used dialectical theory to explain "as a company progresses through developmental phases, each evolutionary period creates its own revolution" (1972: 166). Reflecting on his model, Greiner observed that

> [m]y model is a reasonably explicit attempt to combine unitary life cycle with dialectical theories—but not teleological. For me, life cycle explains the "form" of the unitary stages, while the dialectics explain the underlying dynamics of movement. For example, I put the "crises" in the model because I could not find data showing the stages as naturally and automatically evolving one after the other. Thus, it is not a model where a future life or end state is assured. . . . My reason for saying it is not teleological is that there is no envisioned end state that pulls the process—for me it is the current dynamics within the organization that are driving it forward—convergence around the thesis of each stage and then running into resistance (antithesis) and requiring reorientation for the conflict to be resolved. The model in fact has no ending and concludes with a question mark. . . . I also think it is the dialectics that added the power struggle reality and made the article so successful in managerial reaction. (Greiner, quoted in Van de Ven, 1992: 184)

Row 10: Interaction of teleological and evolutionary motors. Tushman and Romanelli's (1985) punctuated equilibrium model of organizational metamorphosis can be viewed as a product of alternating cycles in the operation of an evolutionary motor of change at a population level of analysis for relatively long convergent periods, punctuated by relatively short and infrequent operations of a teleological motor of change by top managers at the organizational level. During the convergence period, an evolutionary process of competitive selection works to elaborate the structures, systems, controls, and resources of organizations toward increased environmental coalignment. Reorientations represent periods of discontinuous change where an organization's strategies, power, structure, and systems are fundamentally transformed by and realigned toward the purposive actions of executive leaders (Tushman & Romanelli, 1985: 173).

In the punctuated equilibrium model, the authors use time as the avenue for incorporating both evolutionary and teleological motors in a

theory of organizational change. Purposeful enactment by top managers is used to explain the creative process of occasional organizational reorientations, whereas prescribed evolutionary processes explain long periods of organizational convergence with its environment. According to Tushman and Romanelli (1985), in no instance should one expect to find both motors of change operating at the same time in a given organization because they are mutually exclusive. Thus, time provides the vehicle for incorporating opposing change motors in Tushman and Romanelli's punctuated equilibrium model of organizational change. Admittedly, the model does not specify the interplay between the two motors in much detail. It is unclear what sparks the transition from the convergence to the transformational period and vice versa.

Row 14: Interaction of life-cycle, teleological, and evolutionary motors. Weick's (1979) theory of organizing is an ambitious attempt to explain organizing in dynamic fashion. Weick's well-known model for equivocality reduction has three stages—enactment, selection, and retention—which form a life cycle for the organizing process. This cycle repeats many times during the course of an organizing episode. As behavior cycles are selected and retained, there is considerable room for the initiative and creativity of individuals to influence the process, opening the way for the influence of a teleological motor. The assumptions of the teleological motor are reflected in Weick's definition of organizing as the development of a shared grammar. In addition to the life cycle and teleological motor, there also is an evolutionary process at work. Even though individual instances of equivocality reduction follow the three stages, over many repetitions an evolutionary motor operates that selects and retains certain organizational forms over others. This evolutionary motor, strongly influenced by Campbell's (1969, 1974) theory of intellectual evolution, shapes the course of organizing over the longer term.

Again, time is a key mediator of different motors in Weick's theory. The immediate process of organizing is driven through a life-cycle motor and influenced by a teleological motor of participants' choices of adaptations and retentions. However, over the longer run, these short-term actions contribute to an evolutionary process through which different practices, structures, and ideas are selected and retained.

Row 15: Interaction of all four motors of change. The most complex and sophisticated explanation of change and development in Table 3 is one that incorporates interactions from all four generating mechanisms. We have found no example of this composite in the organization and management literature. To illustrate how it might work, we will briefly discuss Riegel's (1975) theory of human development. Riegel distinguished between four progressions of life events, which are analogous to our four generating mechanisms of organizational change: (a) an inner-biological progression of life-cycle events such as birth, illness, cell growth, and death; (b) an individual-personality progression in the psychological development of individuals, in terms of their wishes and du-

ties, plans and skills, and needs for belonging and identity; (c) a cultural-sociological progression of an individual's conformity or deviance with the culture, language, institutions, and customs of the organizations in which the individual participates; and (d) an outer-physical progression of events, such as natural disasters, social demography, or economic cycles that an individual may encounter. Riegel (1975: 392) pointed out that events within and between these progressions are not always synchronized. Developmental crises occur whenever two sequences are out of step. He identified 16 developmental progressions that can be produced by asynchronies along the four developmental progressions, which can result in either destructive outcomes or constructive leaps in development. Riegel (1975: 385) went on to state,

> Once generated, these new developments can transform the previously contradictory interactions of conflicting events into a coordinated, synchronized pattern of interactions and change. As synchrony is reestablished, a form of individual and social progress is achieved. And yet with each successful new development, new questions and discrepancies emerge and, in this process, produce a continuous flux of contradictions and developmental change.

Riegel's theory of human development provides a rich example of what a theory of organizational development might look like if it focused on the crises produced by asynchronies in the operation of life-cycle, teleological, dialectical, and evolutionary motors of change.

Benefits of the Framework for Theory and Research

The approach outlined in this article contributes to organization theory in at least four respects. First, it offers a parsimonious explanation of a wide variety of organizational development and change theories. The four ideal-type motors serve as theoretical primitives, and the complexities of the developmental process can be analyzed as the interplay among these primitives. This interplay makes it possible to discern commonalities among a broad range of specific theories that might otherwise be overlooked. Some review articles, such as Cameron and Whetten's (1983) discussion of organizational life-cycle models, have attempted to do this for a limited range of developmental theories. The current framework extends this projection to the entire breadth of organization development and change.

Second, the framework also can serve as a heuristic for critique and reformulation. In an adequate theory, each ideal-type motor should be represented in its full-fledged form, and the relationships among motors should be fully specified. The framework encourages scholars to identify aspects of motors or relationships that are incompletely described in a given theory. In such cases, it would be necessary to spell out the remainder and fill in details. We hope the framework will promote clearer and more explicit theories of development and change.

Third, the framework points out previously unexplored explanations of organizational change and development. In particular, we could not find examples of theories in the management literature for rows 12, 13, and 15 of Table 3. These "missing" rows represent opportunities for theory building, perhaps through novel applications of theories or metaphors from other contexts. For example, we introduced Riegel's theory of human development to illustrate the structure of a theory of organizational development that incorporates interactions from all four change motors.

Finally, the framework provides a foundation for empirical research. As our example of cochlear implants showed, it is not always clear from the outset what forces are influencing a complex developmental process. Indeed, if it is true that the interplay of multiple forces often drives development, then conducting research with a simple a priori theory in mind actually may impede adequate explanation. The researcher may look only for indicators of that particular theory, ignoring other possible explanations. In the best case, this myopia results in an incomplete account of development and change; in the worst case, the researcher may incorrectly reject his or her model because complexities introduced by other motors covered over evidence of its adequacy. An alternative approach is to collect very rich data and canvass it for several alternative motors of change, as done by the Minnesota Innovation Research Program (Van de Ven, Angle, & Poole, 1989). To do this, the researcher must first determine which of the four motors are operating by testing whether the conditions summarized in Table 2 are present. If more than one motor is operating, the second step is to examine how they are related. This two-step approach, which we call *template matching,* avoids the narrowness imparted by adherence to a simple developmental theory, while keeping a strong theoretical basis for research. Template matching is sensitive to the context of organizational development and change. It promotes the development of explanations commensurate with the complexity of a given process. Moreover, because explanations are cast in terms of the four ideal-type motors and their interplay, this approach promotes the development of more general theories of development and change.

IV. CONCLUSION

This article introduced a typology of four ideal-type theories of organizational development and change: life cycle, teleological, dialectical and evolutionary. These four theories have rich intellectual traditions and offer fundamentally different explanations of change and development processes. Each theory relies on a different motor of change, which can be mapped as a distinct action cycle. However, observed change and development processes in organizations often are more complex than any one of these theories suggests because conditions may exist to trigger inter-

play among several change motors and produce interdependent cycles of change. Even though each of these types has its own internal logic, complexity and the potential for theoretical confusion arise from the interplay among different motors.

Based on the presence or absence of the generating mechanisms underlying the four ideal-type theories, we develop a framework of 16 logically possible explanations of organizational change and development. As the examples illustrate, this framework provides a systematic way to compare and contrast alternative theories of organizational change in the management and organization literature. It also promotes theory construction by identifying logical combinations that have previously not been developed.

An important extension of the framework is to more fully examine the types of relationships that might hold between the four change motors. Several types warrant investigation. First, there is the degree of *nesting* of motors. In some cases motors may operate on the same level of analysis (e.g., the organizational level). However, it is possible that one motor may be nested within the other, for example, when one characterizes the development of the organization as a whole, while the other pertains to the actions of individuals within the organization, or when one depicts the development of an industry and another the development of individual organizations in that industry. When motors are at the same level of analysis, relationships among them represent simple influences; however, when motors are nested, working out the relationships among them requires specifying macro-micro links. A second key relationship is the *timing* of the motors. Motors may operate simultaneously, or they may alternate at different times. If they operate simultaneously, the degrees of amplitude or influence of each motor on a change process over time should be examined. Third, we must consider the degree of *complementarity* among motors. Motors may reinforce or contradict one another. Baum and Singh (1994) provided a constructive approach to examine these relationships by specifying the vertical and horizontal relationships between ecological and genealogical hierarchies in levels of organizational systems.

As these types of relationships suggest, the *relative balance* between the constructive and prescribed motors operating at different levels of analysis are likely to play a major role in explaining patterns of stability and change in an organization. For example, when an institutionally prescribed motor dominates the development of an organization, it may suppress or dampen internally generated variety to the degree that the organization begins to act more rigidly and more predictably. When a constructive motor dominates through either teleological or dialectical processes, the organization may be unable to suppress rival subsystems that rise up from within, creating too much variety to integrate into one system. In other words, positive feedback between constructive and

prescribed motors reinforces change and can produce exploding complexity, whereas negative feedback counteracts the effects of change events and is likely to produce a moving equilibrium in organizational development.

More precisely, temporal shifts in the relative balance between positive and negative feedback loops in the operation of different change motors can push an organization (a) to flow toward a fixed-point equilibrium, (b) to oscillate in a periodic sequence between opposites, (c) to bifurcate far from equilibrium and spontaneously create new structures, or (d) to behave in a random fashion. First, as just stated, organizational stability occurs when a negative feedback loop exists between the operation of prescribed and constructive motors of change. For example, the institutional routines or the established goals of the organization are sufficient to keep the creation of new programs or conflicts between alternative programs within limits so that the organization does not fly apart from too much novelty and, thereby, produce incremental adaptations flowing toward a stable equilibrium. Second, organizational cycles, fads, or pendulum swings occur when the relative influence of positive and negative feedback loops between change motors alternate in a periodic pattern and push the organization to oscillate somewhat farther from its stable equilibrium orbit. Such recurrent cycles are exemplified in some models of vicious circles in organizations (Masuch, 1985), group entrainment processes (McGrath & Kelly, 1986), and creative destruction (Schumpeter, 1942). Third, organizational transformations and spontaneous novel structures can be produced when strong imbalances occur between constructive and prescribed change motors, which may push the organization out of its equilibrium orbit and produce bifurcations (Prigogine & Stengers, 1984) or catastrophes (Zeeman, 1976), leading to chaotic patterns of organizational change. Finally, the behavior of change motors in a developing organization may be so complicated and indeterminate to render deterministic modeling infeasible; the best one can do is to stochastically model the behaviors as a random process. Stochastic models based on the theory of random processes allow researchers to make better predictions than they could make without a model (Eubank & Farmer, 1990).

As this discussion suggests, a major extension of the framework is to develop and study nonlinear dynamical systems models of organizational change and development, which may be produced by feedback loops among two or more simple motors of change. Organizational researchers have tended to focus on linear or cyclical models of organizational development and have treated other seemingly random patterns as either truly stochastic processes (Tuma & Hannan, 1984) or as various forms of "error" distributions messing up their experiments (Abraham, Abraham, & Shaw, 1990). Advances in dynamic systems theory provide mathematical tools for examining chaos as an alternative explanation of organizational change and development processes. These advances have been intro-

duced into the management and organizational literature by Cheng and Van de Ven (In press), Cottrell (1993), Koput (1992), and Polley (1993).

As Koput (1992) stated, a dynamic model is one where the variables (here the operation of the change motors) at a given time are a function (at least in part) of the same variables at an earlier time. Nonlinearity implies that there are feedback loops that vary in strength (loose or tight coupling) and direction (positive or negative) over time between opposing forces or demands. Such nonlinear dynamic models are often path dependent or sensitive to initial conditions. This sensitivity means that small initial differences or fluctuations in trajectories of variables may grow into large differences over time, and as they move far from equilibrium they bifurcate or branch out into numerous possible pathways resembling a chaotic decision tree. In a chaotic state the pathways that are taken in the branching cannot be predicted; they represent spontaneously created new structures that emerge in a seemingly random order. What is impressive about such chaotic processes is that they have a hidden order that typically consists of a relatively simple nonlinear system of dynamic relationships among only a few variables (Eubank & Farmer, 1990). We close "out on a limb" by speculating that underlying the indeterminate and seemingly random processes of development often observed in organizational entities there exists such a relatively simple system of nonlinear dynamic relationships among a few of the motors of change examined here.

Finally, although much can be said in favor of the analytical, heuristic, and research potential of this framework, one common objection will be that it seems overly reductionistic. Can all models of development be reduced to four relatively simple motors and their interactions? The typology is based on an extensive search through hundreds of works, and the four motors emerged as the "least common denominators" of the change theories reflected in those works, reflecting essential differences among these theories. Certainly, the ultimate determinant will be researchers' experience with the typology, using it to analyze existing theories and determining what, if anything, is left out.

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