

Toward An Interdisciplinary Organizational Learning Framework

Dr. Tony Polito, East Carolina University, Greenville, NC

Dr. Kevin Watson, Marist College, Poughkeepsie, NY

ABSTRACT

Organizational learning theory is multidisciplinary. There is no current consensus regarding a model for organizational learning theory. Even a consistent definition of organizational learning has been elusive within the literature, though typologies of organizational learning theories are found. This paper searches for points of agreement regarding organizational learning among organizational theorists, then gives special attention to the economic perspective of organizations and learning. Organizational learning is comprised of both behavioral and cognitive processes; higher-level learning, unlike lower-level learning, involves adaptation. Researchers disagree as to whether either change or effectiveness are requisite to organizational learning. Researchers generally agree that organizational learning that does effect change involves systematic shock anticipated by tension, but differ regarding the constitution of that shock and tension. Specific economic perspectives of the firm can also provide a framework for organizational learning theory. Much of the neoclassical theory of the firm, a set of human-resource holders maximizing profit under a known production function, is under question. Organizational theorists now generally embrace the relevant transaction cost and agency perspectives. Harvey Leibenstein, Harvard economist, views the firm in terms of internal efficiency, embraces Argyris & Schön's perspective of organizational learning as a process of error handling, sees the individual actor's motivation to admit, detect and correct error as a special case of the productivity problem, and analyzes it from a game-theoretic, agency-like manner. Leibenstein's perspective respects much of the noted concordance regarding organizational learning.

INTRODUCTION

Organizational learning theory is multidisciplinary (Dodgson, 1993). Within the literature, researchers note the relevance of psychology, organizational theory, innovation management, strategic management, economics, organizational behavior, sociology, political science, information systems, anthropology, and production/industrial management (Argyris & Schön, 1978b; Dodgson, 1993; Fiol & Lyles, 1985; Leibenstein & Maital, 1994; Perrow, 1986; Shrivastava, 1983). In fact, Argyris and Schön type organizational learning theories parallel to types of associated disciplines (Argyris et al., 1978b). There is, however, a noticeable absence of a multidisciplinary synthesis of organizational learning research (Huber, 1991). Dodgson believes such a synthesis will serve to avoid the introspective and parochial views seen in the existing literature and that synthesis is requisite for future research (Dodgson, 1993). This paper searches for points of agreement among organizational theorists, gives special attention to the economic perspective of organizations and learning, and focuses on Leibenstein's perspective as a point of intersection.

OVERVIEW OF ORGANIZATIONAL LEARNING THEORY

There is no current consensus regarding a model for organizational learning theory. Within a special edition of *Organization Science* on organizational learning, Simon states that organizational theorists should strive towards a higher level of consistency of terminology in describing organizational learning, perhaps drawing on those of cognitive psychologists (Simon, 1991). Other researchers (Argyris & Schön, 1978a; Argyris et al., 1978b; Dodgson, 1993; Fiol et al., 1985; Garvin, 1993; Huber, 1991; Shrivastava, 1983) similarly note the lack of a widely accepted theory or model. Even a consistent definition of organizational learning has been elusive within the literature, as seen in the partial, chronological listing below:

The adaptation of organizational goals, attention rules and search rules as a function of its experience (Cyert & March, 1963)

A series of interactions between adaptation at the individual/subgroup and organizational levels that is stimulated through stress (Cangelosi & Dill, 1965)

The ability to detect and correct error, the mismatch of outcome to expectation (Argyris et al., 1978a)

The process by which knowledge about action-outcome relationships and the effects of the environment on these relationships is developed (Duncan & Weiss, 1979)

The development of insights, knowledge, and associations between past actions, the effectiveness of those actions, and future actions (Fiol et al., 1985)

The encoding of inferences from history into routines that guide behavior (Levitt & March, 1988)

The continual expansion of the organization's capacity to create its future (Senge, 1990)

The acquisition of knowledge by any of its units that it recognizes as potentially useful (Huber, 1991)

The skill of creating, acquiring, and transferring knowledge, and of modifying its behavior to reflect new knowledge and insights (Garvin, 1993)

Typologies of organizational learning theories are found. Shrivastava types four organizational learning perspectives: the process of organizational adaptation, the process of sharing and changing assumptions, the development of an action-outcome knowledge base, and the institutionalization of experience (Shrivastava, 1983). Argyris & Schön define six categories that are based on organizational definitions: organization as group, as agent, as structure, as system, as culture, and as politics (Argyris et al., 1978b). Organizational learning is comprised of both behavioral and cognitive processes. Fiol & Lyles find this distinction persists within the literature and offer resolution by exclusively defining lower-level learning, associations formed under repetition of past behaviors, and higher-level learning, the development of new rules and associations regarding new actions (Fiol et al., 1985). They equate these definitions with Argyris and Schön's single-loop learning, the process of error-and-correction when present norms, policies, or objectives are undisturbed, and double-loop learning, the process of error-and-correction involving their modification (Argyris et al., 1978a). Dodgson equates the two processes (Dodgson, 1993) with Senge's generative learning and adaptive learning (Senge, 1990), and with Gagné's verbal knowledge and cognitive strategy dimensions of individual learning (Gagné, 1994), dimensions that Gagné, in turn, equates with Bloom's Taxonomy. Garvin also acknowledges these two elements, but views them as overlapping, rather than exclusive, processes of organizational learning (Garvin, 1993).

Researchers disagree as to whether either change or effectiveness are requisite to organizational learning (Garvin, 1993). Some state that it need not increase effectiveness, since incorrect learning may occur (Huber, 1991); consider the 'competency traps' such as the QWERTY keyboard offered by Levitt & March (Levitt et al., 1988) or Argyris' skilled incompetence, the skill of protecting oneself from the threat and pain that come with learning while remaining incompetent and blinded to that incompetence (Kofman & Senge, 1993). Fiol & Lyles, however, note a dozen articles that assume learning improves performance (Fiol et al., 1985) and Garvin believes that most scholars agree (Garvin, 1993). Organizational learning need not effect observable organizational change, since it may merely modify existing knowledge (Fiol et al., 1985; Huber, 1991); i.e., organizational learning may be either kinetic or potential in nature. Conversely, organizational change does not infer organizational learning; some change is "unreflective" (Fiol et al., 1985) and some defensive adaptive behaviors require no incremental learning (Hedberg, 1981). Others simply state that learning is not fully equitable with change in a more general fashion (Shrivastava, 1983). One might view Simon's programmed and nonprogrammed decisions (Pugh & Hickson, 2000) in similar fashion. Researchers generally agree that organizational learning that does effect change involves systematic shock anticipated by tension, but differ regarding the constitution of that shock and tension. Sociologist Kurt Lewin states that organizational change is effected when a "felt need for change" is first created, when an "unfreezing" of behaviors is implemented (Lewin & Cartwright, 1951). Chapman, Kennedy, Newell, and Biel studied radar defense operational teams under simulation and observed that their learning did not occur in smooth increments, but was typically preceded by a degree of stress (Chapman, Kennedy, Newell, & Biel, 1959). Cyert and March view the organizational adaptation event as the application of external shock to the organization's 'preexisting preferences of state' and its set of internal decision rules (Cyert et al., 1963). Cangelosi and Dill view stimulating stress as definitional and note that organizational learning is sporadic rather than continuous (Cangelosi et al., 1965). Shrivastava finds several studies that show organizational adaptation occurs in an incremental progression of small adjustments moderated by intraorganizational conflicts and bureaucratic procedures (Shrivastava, 1983). Fiol and Lyles state that there is considerable evidence to suggest "some type of crisis is necessary to effect change under higher-level learning;" organizational myths or past success can predispose resistance and "require shocks, jolts, or crisis for ... adaptation to take place." (Fiol et al., 1985) They also state "the process of learning involves the creation and manipulation of [the] tension between constancy and change." Levitt and March though recognizing that organizations often change through a sequence of small, frequent changes, claim that in order "to be effective, the design of learning organizations must recognize ... the extent to which the comprehension of history may involve ... abrupt rather than incremental changes." (Levitt et al., 1988) March, Sproull, and Tamuz note that critical incidents in an organization's history assume a special role in organizational learning when "history is not generous with experience." (March, Sproull, & Tamaz, 1991) Certain researchers delineate the requisite tension; Chapman *et. al.* identify two types (Chapman et al., 1959), Cangelosi and Dill identify three (Cangelosi et al., 1965).

RELEVANT ECONOMIC PERSPECTIVES OF THE ORGANIZATION

Specific economic perspectives of the firm can also provide a framework for organizational learning theory. Though organizational learning is ill-defined, any conclusions should, at a minimum, tolerate the level of agreement, and find placement within the debate, noted above, as should any economic perspective that proffers analysis. This requirement is complicated by the historic exclusivity of organizational and economic theories (Abrahamsson, 1993; Leibenstein, 1987; Perrow, 1986) and the lack of consensus regarding the economic theory of the firm (Cyert et al., 1963; Ichiishi, 1993).

Neoclassical microeconomics generally acknowledges a firm as an organization of human-resource holders that engages in production activities (Ichiishi, 1993) with the objective of profit maximization under given prices (Abrahamsson, 1993; Cyert et al., 1963). Rational actors with full systematic knowledge (Simon, 1996) and a known production function that optimizes (i.e., cost minimizes) the transformation of inputs into outputs are assumed (Cyert et al., 1963; Leibenstein, 1973; Simon, 1996). Economic efficiency is lost through artificially induced misallocation of input resources among firms (e.g., trade barriers and monopoly) that subvert market equilibrium (Leibenstein, 1966); i.e., competitive markets are more allocative-efficient (Leibenstein, 1973). The Pareto test for allocative efficiency, where no actor loses utility and at least one actor gains utility (Abrahamsson, 1993), is common. Here, each firm is portrayed as a "black box" within a field of "black boxes," with little regard for the internal workings of the organizations (Abrahamsson, 1993; Leibenstein, 1979; Perrow, 1986). Much of this neoclassical paradigm is questioned (Abrahamsson, 1993). The profit maximization objective is challenged by Cyert and March, who suggest rational alternatives to profit such as long-run survival or the set of personal motives of the entrepreneur (Cyert et al., 1963). They also note that Simon and others find greater rationality in a profit "satisficing" (both satisfying and sufficing), rather than profit maximizing, goal (Simon, 1952, 1996); Simon asks, for example, if a firm would not seek compromise between maximizing profit and minimizing risk (Simon, 1996). Leibenstein also advocates the 'relaxation' of the maximization postulate (Leibenstein, 1985, 1987). Simon imposes a bounded, not full, rationality, where actors are significantly constrained by information and computational effort from identifying the optimal (and so, fully rational) solution (Cyert et al., 1963; Simon, 1957, 1996).

Many economists, eschewing the "black box" approach, now view the internal operations of the firm as problematical and choose to analyze it (Perrow, 1986), and a number of new schools of the theory of the firm have emerged, (Ichiishi, 1993) many offering a framework that might be used to analyze the efficiency of the transmission of learning through the organization. Cyert and March's behavioral theory of the firm present organizational learning theory as part of a broader overall economic decision-making basis for the theory of the firm (Cyert et al., 1963). Of special interest are the transactional cost and agency theories of the firm. Transactional cost economics asserts that firms form to avoid the costs associated with maintaining a set of external contractual arrangements; here, pure hierarchies can be interpreted as an efficient series of vertical, implicit, and incomplete contracts (Cyert et al., 1963; Leibenstein, 1987; Williamson, 1975). Relevance to organizational learning is exemplified within Levitt and March's identification of the prohibitive costs of recording certain experiences, the costs associated with retrieval, and the sensitivity of such costs to information technology (Levitt et al., 1988), and further by Kofman & Senge's acknowledgment that "the conventional notion of [organizational] learning is transactional." (Kofman et al., 1993) Agency, or principal-agent, theory holds that the organization is comprised of principals who seek to minimize monitoring and incentive schemes and opportunistic agents who seek to minimize effort (Binmore & Dasgupta, 1986; Cyert et al., 1963; McMillan, 1992). Under agency theory, the informational problems of the firm are seen as the product of "willful strategic misrepresentation by actors in conflict." (Cyert et al., 1963) Crozier's research within the French tobacco industry exemplifies, where technical engineers with expert knowledge regarding machine stoppages game with bureaucrats for control (Crozier, 1964; Pugh et al., 2000). In fact, the nature of agency theory has led it to become a branch of game theory (Binmore et al., 1986; Cyert et al., 1963) view game theory as "an ideal vehicle" for explanation of optimizing agents. Of special significance to organizational learning theory in this area is the foundational work of Alchian and Demsetz regarding informational agency costs (Alchian & Demsetz, 1972).

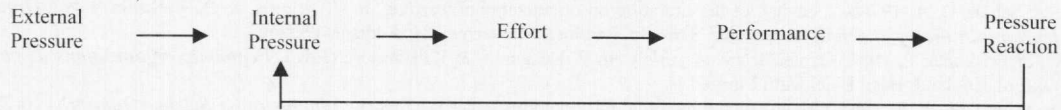
Organizational theorists now generally embrace these perspectives (Cyert et al., 1963; Perrow, 1986), however Perrow criticizes their implicit assumption of competitive self-interest of actors (Perrow, 1986); i.e., their general indifference to the positive aspects of human behavior (Abrahamsson, 1993). Both Perrow and Aoki note comparative lack of such behavior within the idealized Japanese firm (Aoki, 1986; Perrow, 1986); Aoki discusses specific application to informational flows (Aoki, 1986). This criticism is complemented by economists such as

Ichiiishi and Aoki who see the firm as a set of diverse economic agents cooperatively gaming for mutual interests (Aoki, 1984; Ichiiishi, 1993).

LEIBENSTIEN, THE THEORY OF THE FIRM AND ORGANZATIONAL LEARNING

Harvey Leibenstein, Harvard economist, views the firm in terms of internal efficiency. His empirical research indicates firms actually experience insignificant loss due to allocative efficiency (Leibenstein, 1966); rather, firms differ in their X-inefficiencies. These internal inefficiencies occur during the transmissions within the model shown in Figure 1 (Leibenstein, 1987).

FIGURE 1 / LEIBENSTEIN'S BASIC MODEL



Here, the problem of organizational productivity is one of economic loss at these points where effort is gamed against pressure (Leibenstein, 1987), complementing the agency perspective. Stated in less analytic terms, internal inefficiencies result from behavioral considerations, such as worker motivation and the quality of management decisions, and are the major constraints on organizational productivity (Vanagunas, 1989). The scenario is modeled by both Leibenstein and the agency theorists as a Prisoner's Dilemma game; consider the generic utility matrix given in Figure 2.

In the matrix, actor A receives higher utility for noncooperation irrespective of the strategy of actor B; the analysis is equivalent from actor B's perspective. Hence, with neither communication nor collective civility, the individual actors are drawn to a strategy that avoids the Pareto-efficient outcome at upper left, instead finding its equilibrium in the Pareto-inferior, i.e., inefficient, outcome at lower right (McMillan, 1992). Historical interpretations of the disposition to collective civility that negates the Prisoner's Dilemma include the Golden Rule, Kant's Categorical Imperative, Confucianism, omerta (Poundstone, 1992), and culture (Wildavsky, 1992). Where multiple actors are involved, the paradigm is often referred to as the Free Rider problem (Poundstone, 1992) or The Tragedy of the Commons, that Senge discusses and identifies as issue in the learning organization (Senge, 1990). For other intuitive and more thorough introductions to the Prisoner's Dilemma game theory problem, the reader is directed to those such as those found in Poundstone and Rapoport (Poundstone, 1992; Rapoport, 1962). Leibenstein directs these principles in parallel to examine the efficiency of organizational learning (Leibenstein et al., 1994). He embraces Argyris & Schön's perspective of organizational learning as a process of error handling, sees the individual actor's motivation to admit, detect and correct error as a special case of the productivity problem, and provides the game theoretic analysis outlined below.

FIGURE 2 / SAMPLE PRISONER'S DILEMMA UTILITY MATRIX

	Cooperation, B	Noncooperation, B
Cooperation, A	A: 50 ; B: 50	A: -1000 ; B: 500
Noncooperation, A	A: 500 ; B: -1000	A: -500 ; B: -500

Consider an individual actor's strategy against a synthetic group of organizational actors. Where utilities equate with the Prisoner's Dilemma scenario, the noncooperation equilibrium is always selected, X-inefficiency persists, requisite error handling never occurs, and the organization is deemed resistant to learning. For the individual actor, both cooperative and noncooperative utility functions exist, each bounded by the range of cooperating organizational actors, from none to all. Noncooperative utility is always greater, so it can be seen that these utility functions do not intersect. Resistant organizations with the capacity to learn, however, possess two equilibria, mutual cooperation and mutual noncooperation; these utility functions must intersect, and so the outcome is a function of the percentage of organizational actors cooperating. Therefore, to move the organization from resistance to learning, a "critical mass" of cooperating organizational actors must be obtained.

DISCUSSION AND CONCLUSION

Leibenstein's perspective respects and pedestals much of the noted concordance regarding organizational learning. Most noticeably, it analytically justifies the involvement of shock within change. When utilities are such that they consistently draw actors to the noncooperation equilibrium, some shock must take place to form the critical mass for change. Competency traps can be viewed as the intractable Pareto-inferior outcome, reinforced through increasing utilities over iterations. It claims the more pragmatic position of bounded rationality (Leibenstein, 1975), and it is clear that actors in the traditional Prisoner's Dilemma model have incomplete information. It offers explanation for previous studies, e.g., Shrivastava's illustrating of organizational adoption of suboptimal and irrational decision-making patterns (Shrivastava, 1983). In fact, as Vanagunas notes, even Weber does not accept rationality as a constant (Vanagunas, 1989). It embraces game theoretic analysis in concert with agency theorists, and relaxes the questioned maximization postulate. The paradigm is tolerant of decision-making as learning; it allows for learning either with or without change; much in the way of utilities can be altered without changing the Pareto-inferior outcome. Both

cooperation and competition can be analyzed under game theory, as Aoki does the latter. It endures the common viewpoint that individuals are the essential agents for organizational learning (Argyris et al., 1978a; Dodgson, 1993; Schein, 1985; Simon, 1991). It is also explanatory; researchers such as Aoki and Dore believe that low X-inefficiency resulting from collective culture explains the success of Japanese industry, that it effects the rapid dissemination of innovation (Aoki, 1986; Dore, 1983). Thus it appears that Leibenstein's model holds promise as the point for multidisciplinary synthesis of organizational learning research that has been called for by numerous theorists.

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Notes:

Leibenstein employs the term "internal efficiency" and his coinage "X-inefficiency" interchangeably.