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# Exploration and exploitation revisited: Extending March's model of mutual learning

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## Abstract

A system of actors, appropriately organized, is able to learn even in situations where individuals in isolation cannot. This was one of the most important, though seldom emphasized, insights of March's paper [March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87]. The present paper builds on March's original simulation and incorporates a number of different real-world organizational features. The results suggest that unconstrained experimentation is of great benefit to organizational learning, although it should not be carried to excess. Low levels of turnover in personnel are beneficial and mitigate the problem of high socialization March noted in 1991. Inclusion in the policy-making elite should be predicated on performance rather than seniority and on shorter rather than longer individual performance histories, particularly when environments are changing rapidly. Finally, erring on the side of stringency in selecting members of the organization for the policy-making elite is better than erring toward laxity.

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## 1. Introduction

An important albeit seldom emphasized aspect of March's (1991) paper, "Exploration and Exploitation in Organizational Learning", is that individuals are able to learn when participating in an appropriately organized system when they could not do so in isolation. The present paper takes as its starting-point the general principles of March's conceptualization of a collective learning system and links them with work from the

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domains of human resources and strategic management, to ask the question: How do certain organizational policies effect organizations conceptualized as mutual learning systems? Since the learning system March described in 1991 is in essence evolutionary, the organizational policies selected for investigation here were those likely to impact learning through their role in variation (exploration), and in selection and retention (exploitation).

I define learning here, rather simply, as ‘the acquisition of useful knowledge’ and vicarious learning as the acquisition of useful knowledge from others rather than through direct experience. Organizations provide a context in which vicarious learning is facilitated and encouraged. Indeed, it has been suggested that it is their knowledge-sharing properties that accounts for their existence (e.g., Conner & Prahalad, 1996; Grant, 1996a, 1996b). One way in which organizations disseminate knowledge among their members is through routines and standard operating procedures (Cyert & March, 1963; Levitt & March, 1988; March & Simon, 1958). As Levitt and March (1988, p. 320) note: “The experiential lessons of history are captured by routines in a way that makes the lessons, but not the history, available to organizational members who have not themselves experienced the history.” There is a relatively long tradition of considering organizations as learning systems, and as repositories and conduits of knowledge. While Barnard (1938) notes the organization’s utility in achieving ends that require cooperation, he also suggests, as Galbraith (1974) and Egeloff (1982) did later, that organizational structure arises from the need to pass information efficiently. Operations management has a rich literature dealing with learning in organizations (e.g., Argote, 1999; Argote & Darr, 2000; Argote et al., 2000; Argote, McEvily, & Reagans, 2003; Epple, Argote, & Devadas, 1991). The role of routines as a means of holding and disseminating knowledge throughout the organization has been examined by March and Simon (1958). Many studies have followed in this vein, dealing specifically with organizational routines (e.g., Cyert & March, 1963; Levinthal & March, 1981, 1993; Levitt & March, 1988; Lounamaa & March, 1987; March, 1988; March, Schulz, & Zhao, 2000; March & Simon, 1958; Miner, 1994; Nelson & Winter, 1973; Nelson, 1987; Winter, 1987). During the 1990s, knowledge and its role in the firm was the focus of much activity (Galunic & Rodan, 1998; Grant, 1996a, 1996b; Kogut & Zander, 1992, 1993; Nonaka & Takeuchi, 1995), and there was renewed interest in the topic of organizations as learning systems (Bruderer & Singh, 1996; Cohen, 1991; Cohen & Levinthal, 1990; Lant & Mezias, 1992; Levinthal, 1991; Levinthal & March, 1993; March, 1991; March, Sproull, & Tamuz, 1991; Simon, 1991).

Individual experiential learning relies on the temporal or spatial proximity of stimuli that are potentially causally related (Bullock, Gellman, & Baillargeon, 1982; Fiske & Taylor, 1991). Experiential learning involves considering the outcomes of many trials over time and selecting the action that yields an outcome closest to a desired goal (March & Simon, 1958). However, in many situations, clear correlations between cause and effect are hard to detect. When environments are complex and much is changing simultaneously, the links between actions and outcomes are often ambiguous (Levinthal, 1991; Levinthal & March, 1993; Levitt & March, 1988; Lounamaa & March, 1987). Yet March (1991) showed that learning is possible, even where considerable causal ambiguity exists, if individuals are part of an organized system. Although March (1991) has been criticized for presenting an overly narrow and stylized view of organizations, the strength of his original conception lies in its general insight about collective learning in ambiguous settings, regardless of the specifics of its implementation.

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