



Complex hierarchy: The strategic advantages of a trade-off between hierarchical supervision and self-organizing

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ABSTRACT

This paper presents two case studies of research labs in which changes implemented in hierarchical structures differ from the delayering and downsizing reported by current empirical works. In both labs, authority relationships between superiors and subordinates relaxed and became indirect and recursive. Then, together, superiors and subordinates engaged in self-organizing processes and produced structures that had emergent characteristics. The hierarchical structures that were produced exhibited the characteristics of complex organization structures. The conceptualization of these changes, developed in this paper, provides a better understanding of hierarchical structures and authority in complex organization. It invites a reconsideration of the idea that hierarchy inevitably hinders organizational change, and it indicates possibilities for a trade-off between hierarchic supervision and self-organizing. This trade-off provides strategic advantages by helping managers develop organization capacity for learning, innovating, and performing adaptive changes.

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Introduction

In recent years, empirical studies of European, Australian and American organizations have shown that there is a tendency toward the attenuation of hierarchical structures (Littler & Innes, 2004; Littler, Wiesner, & Dunford, 2003; McKinley, Mone, & Barker, 1998; Romme, 1996, 1999a, 1999b; Whittington, Pettigrew, Peck, Fenton, & Conyon, 1999). The attenuation of hierarchy most often takes the form of delayering. These modifications in hierarchies are often concomitant with organizational downsizing (Littler & Innes, 2004; McKinley et al., 1998), which further attenuates organization structures.

For most works, attenuation of hierarchy has been imposed by economic globalization and the rise of the information and knowledge economy. In a context such as this, hierarchy must be attenuated in order to make room for self-organizing processes, which constantly adapt organizational structures to environment, and which foster organization learning and innovation (Graetz & Smith, 2005, 2009; Kramer, 2007; Romme, 1996, 1999b; Schreyögg & Sydow, 2010; Sorge & van Witteloostuijn, 2004; Whittington et al., 1999).

The two case studies presented in this paper address changes in hierarchical structures that differ from those reported by current empirical works. They address the consequences of changes in hierarchical structures in a Research laboratory and in an R&D laboratory, both in the same company. R&D corporate managers and

the two lab heads initiated change processes that aimed at attenuating hierarchical structures in the labs, and in doing so, they hoped that employee creativity would improve.

The change processes transformed hierarchical structures into coordination committees and activity areas. The committees and the activity areas regrouped scientists from Research, or from Development, departments and units that previously belonged to different hierarchical lines. Due to this sharing, authority was relaxed. Interactions between superiors (in the committees) and subordinates (in the activity areas) became more frequent and recursive; any given interaction was the result of a previous one, and the means for the next one.

When these interactions occurred, scientists in the committees and in the activity areas created rules for making decisions about the objectives of scientific activities, about the use of resources and materials, and for evaluating the activities. The scientists at both superior and subordinate levels created a shared reference of interaction, and the subordinates drew upon this reference to experiment with structures production. They tried to organize their work so that they could perform activities which would meet the requirements fixed by the decision rules and evaluation rules made by their superiors.

The cases thus show an unexpected transformation of hierarchical structures. The exertion of authority was relaxed and indirect, and had a recursive character. Hierarchical structures were produced by superiors and subordinates who were recursively interacting on the basis of shared rules. Neither superiors nor subordinates were able, separately, to decide the characteristics of structures, because subordinates, due to the relaxation of

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authority relationships, were able to experiment with structures production.

In order to address these specific changes in the lab hierarchical structures, the author has borrowed from works that draw on complex system theories for dealing with organization structures (Anderson, 1999; Drazin & Sandelands, 1992; Kickert, 1993; Stacey, 1995; Thietart & Forgues, 1995, 1997; Tsoukas, 1998; Tsoukas & Dooley, 2011). These works are of interest because they are based on the idea that in complex organization, structures emerge from recursive interactions among agents for whom authority relationships are relaxed and indirect (Ashmos, Duchon, McDaniel, & Huonker, 2002; Burnes, 2005; Drazin & Sandelands, 1992; Hedberg, Nystrom, & Starbuck, 1976; Osborn & Hunt, 2007; Weick, 1977).

However, when these works are viewed as a whole, a theoretical gap becomes apparent. Actually, scant attention is paid to hierarchy because hierarchical authority has been seen only as strong and direct and preventing agents from engaging in self-organizing processes (Ashmos et al., 2002; Burnes, 2005; Hedberg et al., 1976; Marion & Uhl-Bien, 2001; Osborn & Hunt, 2007; Weick, 1977). Despite this gap, these works still offer an interesting potential for addressing hierarchy, which can be exploited by addressing the specific forms of relaxed and indirect authority, which offer a trade-off between hierarchy and self-organizing.

Our conceptualization of the changes in the two labs aims at exploiting this potential in order to reduce the gap affecting current works. It shows that, when authority relationships between superiors and subordinates were not only relaxed and indirect, but also recursive, new forms of hierarchical structures emerged from superior and subordinate relationships.

Our conceptualization makes three contributions. First, it proposes a conceptualization of hierarchical structures, which is lacking in current works and it provides a more detailed account than current works of the role of authority in the emergence of structures from agents' interactions. Second, it invites a reconsideration of the role of hierarchical structures in complex organization changes. It suggests that hierarchy does not inevitably hinder organizational change, but it can, on the contrary, contribute to change. Third, it opens up interesting possibilities for management. It suggests that it is possible to create a trade-off between hierarchic supervision and self-organizing that yields strategic advantages; it helps managers to develop organization capacity for learning and innovation, and for adaptive changes.

In this paper, the theoretical framework dealing with complex organization structures is first presented. Then, the methodology of the research and the two cases are presented. The conceptualizing of the changes in the hierarchical structures of the labs is carried out by comparing the two cases. The conceptualization is then discussed and its implications examined.

Structures in complex organization

A brief presentation of why complex system theories are useful for addressing organizational structures is given. Then, works drawing on complexity theories for dealing with organizational structures are reviewed. The reasons why these works fail to satisfactorily address hierarchical structures are examined, and then their potential for better dealing with the issue of hierarchy is evaluated.

Complex system and organization theories

Complex system theories have originated from various disciplines, such as biology, physics, chemistry and mathematics. They have given rise to different developments, such as chaos theory (Lorenz, 1963), dissipative structures theory (Nicolis & Prigogine, 1989), complex adaptive system theory (Kauffman, 1993), and autopoiesis theory (Varela, Maturana, & Uribe, 1974). These

theories do not form a unified set of theories; rather, they develop a large variety of concepts and sometimes diverge on important issues. They do, however, agree on the fundamental characteristics of complex system.

Complex system is a set of independent elements, which interact following simple rules. The interactions are non-linear, which means that the elements receive positive and negative feedback from each other that amplify or attenuate the changes occurring in the interactions. This non-linearity results in two major properties: bounded instability and self-organization. Bounded instability means that change is constant but limited in the system, and that, due to this, the system is in a state between order and chaos; this has been labeled an on-the-edge-of-chaos state. Self-organization means that order, or structures, can spontaneously emerge from rule-based interactions among the independent elements of a system.

Complex system theories are attractive to organization theorists because of the highly dynamic view of system they provide (Anderson, 1999; Burnes, 2005; Cillier, 2000; Fitzgerald & van Eijnatten, 2002; Goldstein, 1999; Goldstein, 2000; Goldspink & Kay, 2005; Graët & Smith, 2011; Lissack, 1999; Mathews, White, & Long, 1999b; Tsoukas, 1998). By borrowing from complex system theories, organization theorists treat issues such as emergent structures, self-organization, organization co-construction with environment and on-the-edge-of-chaos structural states (Anderson, 1999; Cillier, 2000; Kramer, 2007; Mathews et al., 1999b; McKelvey, 1999, 2001; Tsoukas, 1998; Tsoukas & Dooley, 2011).

They treat these issues by using complex system theories from various epistemological perspectives. Theorists working in the realist epistemological perspective favor a rigorous application of complex system theories to organization, and they use these theories as a formal language to develop their models or conceptualizations (McKelvey, 1999, 2001). Others, within the post-modern and constructivist perspectives, prefer a metaphorical use of complex system theories and have created the metaphor of chaos (Burnes, 2005; Morgan, 1997; Van Udden, 2005).

The theorists who have developed the metaphor of chaos propose an image of organization as a spontaneous creation of order, or structures, by interacting agents. They offer a very dynamic conception of organization structures. They state that structures are non-linearly transformed by agency, and that they are both stable and unstable, and constantly change. For these theorists, structures are not enduring entities that are independent from the non-linear processes of change that produce and transform them (Graët & Smith, 2011; Langley & Tsoukas, 2010; Tsoukas & Chia, 2002; Tsoukas & Dooley, 2011; Van de Ven & Poole, 2005; Weick & Quinn, 1999). These theorists invite a move from "an ontology of being" to "an ontology of becoming" (Tsoukas & Chia, 2002), and they propose that structural change be considered inherent to organization.

Authority and structures in complex organization

For theorists who are developing the metaphor of chaos, organization structures are inter-subjectively constructed patterns of interactions emerging from agents' recursive rule-based interactions. Agents are free of constraining authority relationships.

Rules are inter-subjectively created by agents while interacting; they codify agents' knowledge and experience of past interactions. Interactions are recursive. At each interaction, agents draw on rules resulting from previous interactions; the rules are also the means for their ulterior interactions (Ashmos et al., 2002; Drazin & Sandelands, 1992; Fuchs, 2002; Giddens, 1984; Goldspink & Kay, 2005; Goldspink & Kay, 2010; Thietart & Forgues, 1997).

The rules, by codifying agents' knowledge and experience of past interactions, reduce the range of agents' possible interactions and typify their interactions. The rules thus generate a convergence of agents' cognitive orientations; agents have a shared reference of

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