ADAPTIVE LEADERSHIP IN COMPLEX SYSTEMS: MOVING BEYOND BUREAUCRATIC CONSTRAINTS

Snežana Mihajlov
Faculty of Business and Legal Studies, MB University
27 Teodora Drajzera Street, 11000 Belgrade, Serbia
snezanamihajlov@hotmail.rs

Nenad Mihajlov
Faculty of Business and Legal Studies, MB University
27 Teodora Drajzera Street, 11000 Belgrade, Serbia
nenadmihajlov@hotmail.com

Abstract: *In increasingly complex dynamic environments, traditional bureaucratic organizations face a fundamental challenge: how to maintain stability while simultaneously developing the capacity for rapid adaptation to emergent changes. This paper explores the role of adaptive leadership in managing complex adaptive systems (CAS) through the lens of Complex Leadership Theory (CLT), focusing on the transformation of bureaucratic structures. Through a critical synthesis of classical and contemporary theories, the paper reveals the essential tension between bureaucratic systems, based on hierarchy and control, and the principles of CLT, which recognize leadership as a distributed, emergent process. The analysis emphasizes how bureaucratic organizations, despite their advantages in stable conditions, become vulnerable in complex environments because of their delayed response to changes and institutional inertia. In contrast, CLT offers a framework in which adaptive leadership acts as a catalyst for organizational transformation, fostering self-organization, collaboration, and innovation through the interactions of multiple actors. The paper illustrates how adaptive leaders, through strategies such as supporting experimentation and tolerance for uncertainty, enable systems to develop dynamically without completely abandoning structural frameworks. In conclusion, the research offers practical guidelines for the application of CLT in bureaucratic organizations, emphasizing the need for a cultural transformation, redistribution of responsibilities, and the development of leaders capable of managing the paradox of "control and creativity." This research contributes to leadership theory by reinterpreting the role of leaders in CAS, highlighting that adaptive leadership is not an alternative to bureaucracy, but a tool for its restructuring under the demands of complexity.*
Keywords: *adaptive leadership, complex adaptive systems, Complex Leadership Theory, bureaucratic organizations, organizational adaptation.*

1. INTRODUCTION

Modern organizations operate in an environment characterized by dynamic complexity, where rapid technological advancement, global interdependence, and unpredictable crises (pandemics, climate change) demand new approaches to management. Traditional bureaucratic models, based on hierarchical control and standardization (Weber, 1947), prove inadequate in contexts where flexibility and creativity become key factors for survival. As Stacey (1996) and Heifetz (2009) highlight, organizations face a paradox: rigid structures, designed for stability, stifle the capacity for rapid adaptation and innovation. This problem raises the need for a theoretical framework that goes beyond reductionist models, and it is precisely this role that the theory of complexity plays–a paradigm that explores how CAS generates emergent patterns through nonlinear interactions (Marion, 1999).

According to complexity theory, organizations are CAS of a dynamic nature, where the collective behavior of members (agents) generates unpredictable outcomes. For example, spontaneous collaboration between teams can lead to innovative solutions without direct management intervention (Uhl-Bien & Marion, 2007). This dynamic, however, requires a reconfiguration of traditional leadership approaches. While bureaucracies insist on centralized control, CAS requires adaptive leadership that encourages decentralization, experimentation, and tolerance for failure (Snowden & Boone, 2007; Schein, 2010). As Hamel (2007) emphasizes, the key difference lies in shifting the focus from "managing people" to "creating conditions for self-organization."

The major challenge of contemporary organizations lies in the inability of bureaucratic systems to integrate the principles of CAS. Namely, hierarchical structures inhibit emergent processes such as spontaneous collaboration or rapid learning, resulting in inertia and a loss of competitiveness (Uhl-Bien & Marion, 2007). The COVID-19 pandemic illustrates this dynamic: organizations with flexible structures quickly adopted hybrid work models, compared to bureaucratic institutions, which confirms the advantage of adaptive approaches (McKinsey, 2020). Therefore, a key question arises: How can adaptive leadership, through the lens of complexity theory, transform bureaucratic systems into organizations capable of harnessing emergent creativity?

The aim of this review is to analyze the mechanisms of adaptive leadership from the perspective of CLT that enable overcoming the limitations of bureaucracies. Through the synthesis of key concepts of complexity theory (nonlinearity, self-organization, emergence), the paper explores how decentralized decision-making, fostering experimentation, and cultural tolerance for risk can serve as catalysts for organizational transformation.

2. COMPLEX ADAPTIVE SYSTEMS

2.1 Definition and Key Characteristics of CAS

Complexity theory offers a scientific paradigm for studying CAS—entities composed of interconnected elements whose interactions generate nonlinear, unpredictable behaviors. Departing from classical linear models that seek mechanistic cause-effect explanations, complexity theory frames the world as organic and dynamic, characterized by uncertainty and emergent order (Regine & Lewin, 2000). This perspective challenges reductionist approaches, positing that systems are too unstable and interdependent to be reduced to simplistic frameworks (Prigogine, 1997). Schneider and Somers (2006) delineate three pillars of complexity theory: nonlinear dynamics, chaos theory, and adaptation/evolution, which collectively illustrate how CAS navigates instability and innovation.

Nonlinear dynamics, rooted in Prigogine's (1996) work on dissipative structures, reveal how systems far from equilibrium develop through energy exchange with their environment. These systems exhibit inherent instability, which drives transformative transitions to states of higher complexity (Mathews et al., 1999). Central to this process is emergence—the spontaneous generation of system-level phenomena, from agent interactions, irreducible to individual components (Holland, 1998; Eoyang, 2011). Emergence arises from nonlinear feedback loops and interdependencies, resisting linear causality (Cilliers, 2000). Uhl-Bien et al. (2007) expand this concept, linking emergence to adaptive creativity through mechanisms like tension dissipation (Prigogine, 1997), synthetic integration (Kauffman, 1993), and network cascades (Bak, 1996). These processes enable CAS to balance stability and change, fostering innovation while maintaining coherence.

Chaos theory complements nonlinear dynamics by emphasizing sensitivity to initial conditions (the butterfly effect) and deterministic chaos—where systems governed by fixed rules exhibit unpredictable trajectories (Lorenz, 1963; Ruelle, 1971). In contrast, complexity theory focuses on self-organization and emergent order, arising from the interplay of

perturbing forces (e.g., innovation, conflict) and stabilizing structures (e.g., institutional frameworks) (Chiles et al., 2004; Thietart & Forgues, 1995). Perturbations push systems into disequilibrium, creating opportunities for adaptation, while stabilizers prevent chaotic collapse. This dialectic mirrors Prigogine and Stengers' (1984) assertion that chaos and order coexist in autocatalytic cycles, where entropy and synergy drive progressive complexity.

Self-organization, a cornerstone of complexity theory, explains how CAS adapts through endogenous processes rather than external directives. Systems reorganize spontaneously via dynamic energy and information exchanges, optimizing functionality under shifting conditions (Prigogine & Stengers, 1984). Stacey (1995) underscores nonlinear feedback as the engine of evolutionary change, where agent interactions generate novel strategies. For example, dissipative structures transform chaos into hierarchical order, illustrating how systems leverage instability to achieve emergent states transcending individual capabilities.

Complexity theory provides a robust framework for analyzing CAS in organizational contexts, emphasizing nonlinearity, emergence, and self-organization as critical to managing modern challenges. By embracing disequilibrium, fostering decentralized innovation, and balancing stability with adaptability, organizations can cultivate resilience, agility, and sustainable success in volatile environments. This transformation in approach—from mechanistic control to organic coordination—equips leaders to navigate uncertainty by harnessing the inherent creativity of complex systems.

2.2 CAS in the Organizational Context

CAS provides a critical framework for analyzing organizations as dynamic entities characterized by non-linear interactions among heterogeneous agents. This paradigm conceptualizes organizations as intricate networks where sustained interactions among agents—individuals or collectives—foster collective synergy through shared objectives, knowledge, and perspectives (Marion, 1999; Regine & Lewin, 2000). Exogenous pressures (e.g., environmental volatility, regulatory shifts) and endogenous tensions stemming from interdependencies, resource competition, and divergent priorities continually shape these systems. Such tensions propagate through interconnected agents, catalyzing emergent properties—spontaneously arising phenomena like adaptive learning, innovation, and self-organizing mechanisms. Crucially, these emergent behaviors are irreducible to individual intentionality, including formal leadership, and instead arise organically from collective dynamics, enabling decentralized adaptability to navigate uncertainty and drive iterative development (Uhl-Bien & Marion, 2009).

Central to CAS adaptability are four interconnected conditions: dynamic interactions, interdependence, heterogeneity, and adaptive tension. Dynamic interactions, as articulated by Cilliers (1998), involve continuous, non-linear exchanges among agents, blending conflict, collaboration, and reflexivity to generate systemic transformation. These recursive processes allow CAS to transcend static equilibrium, leveraging disequilibrium, to sustain adaptability. Without such dynamism, systems would stagnate into predictability, losing the ability to respond to environmental perturbations.

Building on this, interdependence—rooted in shared systemic needs (Marion & Uhl-Bien, 2001)—compels agents to collaborate toward collective objectives, ensuring isolated actions coalesce into coherent adaptive responses. Conversely, heterogeneity—diversity in skills, technologies, and perspectives (Sutton, 2002)—introduces creative disruption. Divergent viewpoints generate cognitive friction, catalyzing non-linear problem-solving. For example, interdisciplinary team conflicts often yield innovative solutions unattainable through homogeneous consensus.

Adaptive tension emerges as the catalytic force bridging these elements. It arises from competing constraints (e.g., resource scarcity, leadership demands) and the imperative to reconfigure relational or structural paradigms (Heifetz & Laurie, 2001). This tension acts as a "creative stressor," driving systems to innovate, learn, or reorganize. Heterogeneity amplifies tension through diversity-driven discord, while dynamic interactions mediate its resolution via collective learning or structural adaptation.

Ultimately, the symbiosis of interdependence, heterogeneity, and adaptive tension defines CAS. Interdependence motivates collaborative agency, heterogeneity injects generative instability, and adaptive tension imposes evolutionary pressure, all mediated by dynamic interactions. Together, they form a self-sustaining loop where disorder and order coexist, enabling CAS to navigate complexity through emergent, self-organized resilience. This framework underscores leadership not as centralized control, but as the cultivation of contexts where organic interactions catalyze transformation—a paradigm vital for thriving in volatile socio-organizational landscapes.

2.3 Implications of CAS for Leadership

Understanding modern organizations as CAS requires a shift in leadership theory, moving beyond traditional models rooted in bureaucratic efficiency and hierarchical control. Classical approaches designed for stable environments falter in today's volatile, non-linear business landscapes, where adaptability supersedes predictability as a core organizational imperative (Schreiber & Carley, 2007). This dissonance underscores the critical challenge articulated by Uhl-Bien and Arena (2018): enabling organizations to thrive amid dynamic, often chaotic external pressures by reimagining leadership as a catalyst for systemic adaptability.

In contrast to mechanistic, top-down frameworks, complexity-informed leadership redefines the phenomenon as an emergent, distributed process arising from networked interactions among heterogeneous agents (Uhl-Bien et al., 2007). Leadership ceases to be synonymous with formal authority; instead, it manifests through decentralized relational dynamics that stimulate collective innovation and transformation. This perspective aligns with Gronn's (2002) and Osborn et al.'s (2002) emphasis on leadership as a multi-agent activity, where communication patterns and collaborative synergies drive organizational evolution.

Central to this reconceptualization are principles of self-organization, emergence, and co-evolution, which position leaders as architects of environments conducive to adaptive learning (Schneider & Somers, 2006). By fostering decentralized decision-making and knowledge-sharing ecosystems, leaders enable emergent problem-solving—processes where novel strategies and practices arise organically from agent interactions rather than top-down mandates. For instance, Surie and Hazy (2006) identify adaptability and innovation as critical competencies for navigating uncertainty, achieved not through directive control, but by nurturing conditions for experimentation and cross-functional collaboration.

The efficacy of complexity leadership thus hinges on orchestrating disequilibrium—strategically balancing stability and creative disruption to catalyze systemic resilience (Uhl-Bien et al., 2007). Leaders function as boundary spanners, designing contexts where tensions between competing priorities (e.g., efficiency vs. innovation) generate adaptive energy. This involves cultivating spaces for dissent, interdisciplinary dialogue, and iterative experimentation, allowing organizations to develop through feedback loops and co-evolutionary adjustments.

Ultimately, complexity theory reframes leadership as a meta-organizing process where influence spreads across networks, outcomes are non-linear, and transformation emerges from the interplay of diverse agents within fluid, adaptive structures. By transcending individual-centric models, this framework equips organizations to harness chaos as a generative force, positioning leadership not as a role but as a dynamic enabler of systemic vitality.

3. FROM BUREAUCRACY TO CAS: WHY IS CHANGE NECESSARY?

Despite theoretical narratives proclaiming the "death of bureaucracy," empirical evidence reveals its enduring presence. Bureaucratic features—hierarchical control, task specialization, and formalized procedures—persist as foundational elements, particularly when institutionalized over time (Hazy, 2011; Volton, 2005). This durability underscores bureaucracy's structural and symbolic entrenchment, even as modern organizations increasingly face volatile, uncertain environments. Crucially, bureaucracy's design prioritizes efficiency and stability over adaptability (Brown & Eisenhardt, 1997; Eisenhardt & Tabrizi, 1995), a flaw rooted in its rigid architecture. As Weber (1980) conceptualized, bureaucracy formalizes hierarchy and rules to ensure continuity, yet this rigidity inherently limits flexibility and entrenches social inequalities. Vertical hierarchies isolate decision-making at the top, stifling horizontal collaboration and organic innovation (Burns & Stalker, 1961; Diefenbach & Sillince, 2011).

Paradoxically, while bureaucracy suppresses informal vertical interactions, informal hierarchies emerge laterally among peers, replicating dominance dynamics through social norms or personal traits (Pasini & Morseli, 2009). These micro-level hierarchies, though unintended, mirror the formal system's logic, further entrenching a culture of control. Such structures create organizational fragility: mechanistic adherence to protocols stifles creativity, leaving systems ill-equipped for rapid adaptation (Stacey, 1996; Weick, 1995). For instance, Hirst et al. (2011) demonstrate that high centralization and formalization suppress individual creativity, which thrives only in decentralized, low-formalization contexts. Similarly, Schneider and Somers (2006) argue that rigid systems "freeze" behavioral patterns, buffering against external change, and diverting resources to maintain the status quo.

This tension highlights bureaucracy's fundamental incompatibility with CAS, which prioritizes self-organization, emergent innovation, and distributed learning (Uhl-Bien et al., 2007). Unlike bureaucracies, CAS leverage decentralized interactions to generate adaptive responses, balancing stability with organic flexibility. The bureaucratic obsession with control stifles the spontaneous collaboration and experimentation essential for navigating complexity. For example, excessive procedural standardization limits unconventional problem-solving, while centralized decision-making delays responses to dynamic challenges.

The solution lies in reimagining organizational design to harmonize hierarchical discipline with CAS principles. By fostering environments where formal structures coexist with adaptive networks, organizations can mitigate inertia while retaining coherence. This hybrid approach, as advocated by Schneider and Somers (2006), enables systems to develop without sacrificing functionality, transforming rigidity into resilience. Thus, the shift from bureaucracy to CAS is not merely theoretical—it is a pragmatic imperative for survival in an era defined by disruption and nonlinear change.

4. COMPLEX LEADERSHIP THEORY

CLT redefines leadership as a dynamic, emergent phenomenon rooted in the principles of CAS. Departing from traditional hierarchical models, CLT posits that organizational evolution arises not from centralized control, but from distributed interactions among agents within a network (Uhl-Bien & Marion, 2009). Leadership, in this framework, transforms into a non-linear process of self-organization and collective adaptation, where innovation emerges organically through decentralized exchanges of knowledge and resources (Marion & Uhl-Bien, 2001). Central to CLT is the premise that transformative change stems from dynamic interdependencies among individuals, teams, and structures, rather than top-down mandates. Here, leaders assume the role of "architects of conditions," designing environments that foster information flow, synergy, and emergent intelligence, enabling organizations to respond

nimbly to transformative challenges (e.g., technological shifts) through distributed problem-solving (Lichtenstein et al., 2006; Uhl-Bien et al., 2007).

CLT's theoretical framework integrates three interdependent functions to balance organizational stability and adaptability (Uhl-Bien et al., 2007):

- Administrative Leadership: Formal managers ensure operational efficiency through strategic planning, resource allocation, and hierarchical coordination, institutionalizing objectives via bureaucratic structures (Selznick, 1957). This function prioritizes predictability, crisis management, and alignment with long-term visions, maintaining the structural integrity necessary for day-to-day functionality.
- Adaptive Leadership: Emerging from informal networks, this process drives innovation through collaborative interactions where agents collectively address adaptive challenges. By leveraging interdependencies and cognitive diversity, adaptive leadership generates emergent solutions that transcend rigid hierarchies, fostering creativity in response to volatility (Uhl-Bien et al., 2007).
- Enabling Leadership: Acting as a mediator, this function bridges bureaucratic and adaptive paradigms. It cultivates environments for flexible processes (e.g., innovation hubs) and facilitates knowledge transfer between informal networks and formal systems. Enabling leadership ensures that adaptive insights become institutionalized without stifling organic creativity, thus harmonizing structural rigor with evolutionary flexibility.

While administrative leadership provides stability, its centralized decision-making and limited horizontal communication (Burns & Stalker, 1961) often constrain agility. Adaptive leadership counterbalances this rigidity by injecting generative disruption through decentralized collaboration, yet risks fragmentation without structural anchors. Enabling leadership resolves this tension by orchestrating conditions for co-evolution, translating emergent ideas into actionable strategies while preserving bureaucratic coherence (Osborn & Hunt, 2007). For instance, adaptive networks might prototype novel solutions to technological disruptions, which enabling leaders then integrate into formal workflows, ensuring alignment with organizational goals.

CLT's structural cohesion lies in its capacity to harmonize competing imperatives—stability versus flexibility, control versus emergence. By interweaving administrative, adaptive, and enabling functions, organizations cultivate resilient adaptability, navigating complexity through iterative learning and distributed intelligence. This integrative approach not only mitigates bureaucratic inertia, but also positions organizations to thrive in volatile environments, where sustained success hinges on balancing order with creative disequilibrium.

5. ADAPTIVE LEADERSHIP IN BUREAUCRATIC SYSTEMS: CAS PERSPECTIVE

Within CAS, organizations function as dynamic networks of interdependent agents whose interactions generate emergent patterns of innovation and adaptation. Leadership in this context transcends formal authority, emerging instead from decentralized, heterogeneous interactions among employees, teams, and stakeholders (Heifetz, 1994; Plowman et al., 2007). Adaptive leadership arises when individuals or groups, regardless of hierarchical roles, collaboratively address "adaptive challenges"—problems with no predefined solutions—through dialogue, experimentation, and conflict (Heifetz, 1994). For example, cross-departmental task forces in bureaucratic systems often bypass rigid procedures by leveraging informal networks to resolve systemic bottlenecks, illustrating how leadership influence stems from collective agency rather than top-down mandates.

Adaptive leadership is not a planned process, but a systemic characteristic rooted in distributed intelligence. It manifests through continuous learning, knowledge sharing, and

self-organization, where innovations emerge organically from informal networks—even at the lowest organizational levels (Plowman et al., 2007). Formal leaders, rather than dictating solutions, act as architects of context, fostering environments where emergent creativity thrives. Their role shifts from "chief decision-maker" to "enabler of collective intelligence," balancing stability with flexibility by cultivating trust, removing collaboration barriers, and supporting experimentation (Marion & Uhl-Bien, 2001; Regine & Lewin, 2000).

A critical enabler of adaptive leadership is psychological safety, where employees feel secure in taking risks, voice dissent, and learn from failures without fear of retribution (Edmondson, 1999). Trust and mutual respect within teams create a foundation for open communication, which drives knowledge exchange and innovation. Edmondson's research underscores that interpersonal dynamics—more than technical resources—determine organizational learning capacity. In bureaucracies, formal leaders nurture this culture by symbolically reinforcing collaboration (e.g., storytelling, workshops) and designing workspaces (physical or digital) that encourage spontaneous interactions (Schein, 2010).

Formal leaders in bureaucratic systems must strategically manage multi-level networks to catalyze adaptive processes. This involves:

- Aggregate Level: Strengthening intra-team collaboration through autonomy and delegated decision-making (Manz & Sims, 1984).
- Meta-Aggregate Level: Bridging departmental silos via cross-functional initiatives.
- Meta-Meta-Aggregate Level: Building ecosystems with external partners (e.g., suppliers, communities) to enhance resilience (Regine & Lewin, 2000).

For instance, hybrid work models that blend direct customer-supplier relationships with community partnerships can drive sustainability and adaptability. By enriching these networks, leaders transform bureaucratic rigidity into structured flexibility, where rules adapt to context rather than being followed dogmatically.

Adaptive leadership thrives on productive tension. Leaders must balance resolving interpersonal conflicts swiftly while encouraging task-related disagreements that spur innovation (Jehn, 1997). Cross-departmental meetings and digital platforms can dismantle informational silos, fostering multilevel communication. For example, open-office layouts or collaborative tools like Slack create spaces for serendipitous idea exchange, aligning with Schein's (2010) emphasis on workspace design as a cultural lever.

CLT redefines leadership as a meta-organizing process where outcomes emerge from nonlinear interactions between intentional agency and spontaneous forces. Formal leaders act as catalysts of self-organization, prioritizing context-shaping over control (Plowman et al., 2007). By delegating authority, nurturing networks, and embracing uncertainty, they enable bureaucracies to develop from rule-bound mechanisms into living systems capable of harnessing collective intelligence. The essence of adaptive leadership lies not in commanding change but in creating conditions where the organization itself becomes the leader, dynamically navigating complexity through emergent, distributed ingenuity.

6. CONCLUSION

The exploration of adaptive leadership within bureaucratic systems through the lens of CAS and CLT reveals a transformative pathway for organizations entrenched in hierarchical rigidity. Traditional bureaucracies, designed for stability and efficiency, falter in dynamic environments where adaptability and innovation are paramount. This paper underscores how integrating CAS principles—nonlinearity, emergence, and self-organization—enables bureaucratic structures to develop into resilient, agile entities capable of navigating complexity.

Central to this transformation is the redefinition of leadership as a distributed, emergent process rather than a centralized function. Adaptive leadership, rooted in CLT, shifts the role

of formal leaders from controllers to architects of context, who cultivate environments where decentralized interactions and collective intelligence thrive. By fostering psychological safety, leaders empower employees to engage in risk-taking, dissent, and collaborative problem-solving, thus unlocking the creative potential inherent in informal networks (Edmondson, 1999). This cultural shift is critical for dismantling the inertia imposed by rigid hierarchies and procedural dogmatism.

The synthesis of administrative, adaptive, and enabling leadership functions (Uhl-Bien et al., 2007) provides a framework for balancing stability with flexibility. Administrative leadership ensures operational coherence, while adaptive leadership drives innovation through emergent, agent-driven interactions. Enabling leadership bridges these paradigms, translating grassroots insights into institutional strategies without stifling organic creativity. For instance, cross-departmental task forces and hybrid work models exemplify how structured flexibility can coexist with bureaucratic discipline, enabling organizations to respond dynamically to disruptions like technological shifts or global crises.

Practically, leaders must prioritize network orchestration across multiple levels—strengthening intra-team collaboration, bridging departmental silos, and building external partnerships (Regine & Lewin, 2000). Workspace design, conflict management, and decentralized decision-making further catalyze adaptive processes, transforming bureaucracies into living systems that leverage distributed intelligence.

This research contributes to leadership theory by repositioning adaptive leadership not as a replacement for bureaucracy, but as a catalytic tool for its evolution. By harmonizing hierarchical rigor with CAS principles, organizations can achieve a paradoxical balance—maintaining control while nurturing creativity. Future research should explore longitudinal case studies of bureaucracies undergoing this transformation, particularly in sectors like healthcare or education, where rigidity often impedes innovation. Investigating the role of digital tools in scaling adaptive networks could offer insights into sustaining agility in large, traditionally hierarchical institutions.

In conclusion, the transition from bureaucratic stagnation to adaptive vitality hinges on reimagining leadership as a meta-organizing force. By embracing complexity, leaders can transform bureaucracies into ecosystems where order and chaos coexist, fostering resilience and ingenuity in an era defined by uncertainty.

LITERATURE:

1. Bak, P. (1996). *How Nature Works: The Science of Self-Organized Criticality*. Copernicus. https://doi.org/10.1007/978-1-4757-5426-1
2. Brown, S. L., & Eisenhardt, K. M. (1997). The Art of Continuous Change: Linking Complexity Theory and Time-Paced Evolution in Relentlessly Shifting Organizations. *Administrative Science Quarterly, 42*(1), 1-34. https://doi.org/10.2307/2393807
3. Burns, T., & Stalker, G. M. (1961). *The Management of Innovation*. Tavistock Publications.
4. Chiles, T. H., Meyer, A. D., & Hench, T. J. (2004). Organizational Emergence: The Origin and Transformation of Self-Organizing Systems. *Organization Science, 15*(5), 499-519. https://doi.org/10.1287/orsc.1040.0095
5. Cilliers, P. (1998). *Complexity and Postmodernism: Understanding Complex Systems*. Routledge.
6. Cilliers, P. (2000). What Can We Learn from a Theory of Complexity? *Emergence, 2*(1), 23-33. https://doi.org/10.1207/S15327000EM0201_03
7. Diefenbach, T., & Sillince, J. A. A. (2011). Formal and Informal Hierarchy in Different Types of Organization. *Organization Studies, 32*(11), 1515-1537. https://doi.org/10.1177/0170840611421254

8. Edmondson, A. (1999). Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly, 44*(2), 350-383. https://doi.org/10.2307/2666999
9. Eisenhardt, K. M., & Tabrizi, B. N. (1995). Accelerating Adaptive Processes: Product Innovation in the Global Computer Industry. *Administrative Science Quarterly, 40*(1), 84-110. https://doi.org/10.2307/2393701
10. Eoyang, G. H. (2011). *Conditions for Self-Organizing in Human Systems*. Ph.D. Dissertation, Union Institute and University.
11. Gronn, P. (2002). Distributed Leadership as a Unit of Analysis. *The Leadership Quarterly, 13*(4), 423-451. https://doi.org/10.1016/S1048-9843(02)00120-0
12. Hamel, G. (2007). *The Future of Management*. Harvard Business Review.
13. Hazy, J. K. (2011). Parsing the "Influential Increment" in the Language of Complexity: Uncovering the Systemic Mechanisms of Leadership and Entrepreneurship. *Emergence: Complexity and Organization, 13*(3), 52-65.
14. Heifetz, R. A. (1994). *Leadership Without Easy Answers*. Belknap Press. https://doi.org/10.4159/9780674038479
15. Heifetz, R. A. (2009). *The Practice of Adaptive Leadership: Tools and Tactics for Changing Your Organization and the World*. Harvard Business Press.
16. Heifetz, R. A., & Laurie, D. L. (2001). The Work of Leadership. *Harvard Business Review, 79*(11), 131-141.
17. Hirst, G., Van Knippenberg, D., & Zhou, J. (2011). A Cross-Level Perspective on Employee Creativity: Goal Orientation, Team Learning Behavior, and Individual Creativity. *Academy of Management Journal, 52*(2), 280-293. https://doi.org/10.5465/amj.2009.37308035
18. Holland, J. H. (1998). *Emergence: From Chaos to Order*. Basic Books. https://doi.org/10.1093/oso/9780198504092.001.0001
19. Jehn, K. A. (1997). A Qualitative Analysis of Conflict Types and Dimensions in Organizational Groups. *Administrative Science Quarterly, 42*(3), 530-557. https://doi.org/10.2307/2393737
20. Kauffman, S. A. (1993). The Origins of Order: Self-Organization and Selection in Evolution. Oxford University Press. https://doi.org/10.1093/oso/9780195079517.001.0001
21. Lichtenstein, B. B., Uhl-Bien, M., Marion, R., Seers, A., Orton, J. D., & Schreiber, C. (2006). Complexity Leadership Theory: An Interactive Perspective on Leading in Complex Adaptive Systems. *Emergence: Complexity and Organization, 8*(4), 2-12.
22. Lorenz, E. N. (1963). Deterministic Nonperiodic Flow. *Journal of the Atmospheric Sciences, 20*(2), 130-141.
23. Manz, C. C., & Sims, H. P. (1984). Searching for the Unleader: Organizational Member Views on Leading Self-Managed Groups. *Human Relations, 37*(5), 409-424. https://doi.org/10.1177/001872678403700504
24. Marion, R. (1999). *The Edge of Organization: Chaos and Complexity Theories of Formal Social Systems*. SAGE Publications.
25. Marion, R., & Bacon, J. (1999). Organizational Extinction and Complex Systems. *Emergence, 1*(4), 71-96. https://doi.org/10.1207/s15327000em0104_5
26. Marion, R., & Uhl-Bien, M. (2001). Leadership in complex organizations. *The Leadership Quarterly, 12*(4), 389-418. https://doi.org/10.1016/S1048-9843(01)00092-3
27. Mathews, K. M., White, M. C., & Long, R. G. (1999). Why study the complexity sciences in the social sciences? *Human Relations, 52*(4), 439-462. https://doi.org/10.1177/001872679905200402
28. McKinsey & Company. (2020). *COVID-19: Implications for Business*. McKinsey Global Publishing.

29. Osborn, R. N., & Hunt, J. G. (2007). Leadership and the choice of order: Complexity and hierarchical perspectives. *The Leadership Quarterly, 18*(4), 319-340. https://doi.org/10.1016/j.leaqua.2007.04.003
30. Osborn, R. N., Hunt, J. G., & Jauch, L. R. (2002). Toward a Contextual Theory of Leadership. *The Leadership Quarterly, 13*(6), 797-837. https://doi.org/10.1016/S1048-9843(02)00154-6
31. Pasini, A., & Morselli, D. (2009). The role of informal hierarchies in leadership transitions. *Human Relations, 62*(7), 1025-1045.
32. Plowman, D. A., Solansky, S., Beck, T. E., Baker, L., Kulkarni, M., & Travis, D. V. (2007). The role of leadership in emergent, self-organization. *The Leadership Quarterly, 18*(4), 341-356. https://doi.org/10.1016/j.leaqua.2007.04.004
33. Prigogine, I. (1996). The End of Certainty: Time, Chaos, and the New Laws of Nature. Free Press.
34. Prigogine, I. (1997). *The Laws of Chaos*. The British Library.
35. Prigogine, I., & Stengers, I. (1984). *Order Out of Chaos: Man's New Dialogue with Nature*. Bantam Books.
36. Reagans, R., & Zuckerman, E. W. (2001). Networks, diversity, and productivity: The social capital of corporate R&D teams. *Organization Science, 12*(4), 502-517. https://doi.org/10.1287/orsc.12.4.502.10637
37. Regine, H., & Lewin, R. (2000). Leading at the edge: How leaders influence complex systems. *Emergence, 2*(2), 5-23. https://doi.org/10.1207/S15327000EM0202_02
38. Ruelle, D. (1971). Turbulent dynamical systems. *Publications Mathématiques de l'Institut des Hautes Études Scientifiques*, 50(1), 27-55. https://doi.org/10.1007/BF02684768
39. Schein, E. H. (2010). *Organizational culture and leadership* (4th ed.). Jossey-Bass.
40. Schneider, M., & Somers, M. (2006). Organizations as complex adaptive systems: Implications of complexity theory for leadership research. *The Leadership Quarterly, 17*(4), 351-365. https://doi.org/10.1016/j.leaqua.2006.04.006
41. Schreiber, C., & Carley, K. M. (2007). Network leadership: Leading for adaptation and innovation in complex systems. *Emergence: Complexity and Organization, 9*(4), 32–49.
42. Selznick, P. (1957). *Leadership in Administration: A Sociological Interpretation*. University of California Press.
43. Snowden, D. J., & Boone, M. E. (2007). A leader's framework for decision making. *Harvard Business Review, 85*(11), 68-76.
44. Stacey, R. D. (1995). The science of complexity: An alternative perspective for strategic change processes. *Strategic Management Journal, 16*(6), 477-495. https://doi.org/10.1002/smj.4250160606
45. Stacey, R. D. (1996). *Complexity and Creativity in Organizations*. Berrett-Koehler Publishers.
46. Surie, G., & Hazy, J. K. (2006). Generative leadership: Nurturing innovation in complex systems. *Emergence: Complexity and Organization, 8*(4), 13-26.
47. Sutton, R. I. (2002). The weird rules of creativity. *Harvard Business Review, 80*(8), 94-103. https://doi.org/10.1109/EMR.2002.1022420
48. Thietart, R. A., & Forgues, B. (1995). Chaos theory and organization. *Organization Science, 6*(1), 19-31. https://doi.org/10.1287/orsc.6.1.19
49. Uhl-Bien, M. (2006). Relational leadership theory: Exploring the social processes of leadership and organizing. *The Leadership Quarterly, 17*(6), 654-676. https://doi.org/10.1016/j.leaqua.2006.10.007
50. Uhl-Bien, M., & Arena, M. (2018). Leadership for organizational adaptability: A theoretical synthesis and integrative framework. *The Leadership Quarterly, 29*(1), 89-104. https://doi.org/10.1016/j.leaqua.2017.12.009

51. Uhl-Bien, M., & Marion, R. (2007). Complexity Leadership Theory: Shifting Leadership from the Industrial Age to the Knowledge Era. *The Leadership Quarterly, 18*(4), 298-318. https://doi.org/10.1016/j.leaqua.2007.04.002
52. Uhl-Bien, M., & Marion, R. (2009). Complexity leadership in bureaucratic forms of organizing: A meso model. *The Leadership Quarterly, 20*(4), 631-650. https://doi.org/10.1016/j.leaqua.2009.04.007
53. Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly, 18*(4), 298-318. https://doi.org/10.1016/j.leaqua.2007.04.002
54. Volton, D. J. (2005). The persistence of bureaucracy: A meta-analysis of Weber's model of bureaucratic control. *Organization Studies, 26*(4), 569-600. https://doi.org/10.1177/0170840605051481
55. Weber, M. (1947). *The Theory of Social and Economic Organization*. Free Press.
56. Weber, M. (1980). *Economy and Society: An Outline of Interpretive Sociology*. University of California Press.
57. Weick, K. E. (1995). *Sensemaking in Organizations*. SAGE Publications.